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"Sustainability from an Economic and Social Perspective"

### Book of Proceedings

Editors:

Ana Lorga da Silva, Daniel Tomic, Alica Grilec



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## CHARGING THE BUDGET OF THE CITY WROCLAW WITH URBANISATION COSTS (POLAND)

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### **ABSTRACT**

*The paper deals with the issue of charging local authorities with the costs of realisation of the provisions contained in local spatial development plans in Wroclaw (Poland). Considering the planned spatial development in the area of the city Wroclaw, the urbanisation costs that are chargeable to the municipality budget were identified. The economic effects of preparing areas designated for development in the residential programme offer were analysed. The paper provides an analysis of the cost of realisation of investments that belong to own duties of the municipality, including the cost of building municipality roads, sewage and water supply networks, arranging public greenery and purchasing land for public investments. The analyses were performed within the administrative borders of the city. The prognosed costs of the realisation of local spatial development plans demonstrate significant expenditure that Wroclaw has to incur for the construction of sewage network and municipal roads. Additionally, the development of new areas will require the city of Wroclaw to take over the real properties on which public goals are planned to be realised. One should thoroughly consider the actual need for new investment areas in the city. Demographic forecasts demonstrate that the areas designated for development significantly exceed the demand.*

**Keywords:** *financial effects of urbanisation, costs of realisation of spatial development plans*

### **1. INTRODUCTION**

The local spatial development plan is the only planning document in Poland that is an act of local law. As a result, the provisions concerning the designation of areas and principles of their development are generally binding. It is also the only planning document with such high legal status. When adopting the resolution on preparing the local spatial development plan, the Municipal Council should be aware of the financial consequences of the document as early as at the stage of drawing up the plan. Due to that, the legislative authority imposed the obligation to prepare a forecast of the financial results of adopting the local spatial development plan. Such forecast shall estimate the revenues and expenditures of the municipality that result from adopting the plan (Cymerman, Bajerowski, Kryszk, 2010). Information contained in the forecast may safeguard municipal authorities against the emergence of unexpectedly high costs resulting from the payment of compensation for damages for the negative impact of the local spatial development plan. The forecast may also identify potential opportunities to obtain revenues from the realisation of the provision of the plan (Cymerman, Bajerowski, Kryszk, 2010). It estimates own revenues as well as the costs incurred by the municipal budget with respect to the realisation of the tasks of the municipality (Heldak, Pluciennik, 2017). Data contained in the forecast may also be helpful in choosing the direction of the investment financing policy and in preparing annual financial plans of the municipality. The provisions of the local spatial development plan constitute the basis for the realisation of investments and obtaining a building permit (Heldak, Raszka, 2013; Heldak, Raszka, Szczepański, 2016). The identification of financial expenditures of the municipality results from the Act on Local Self-Government (Act on Local Self-Government), which provides a list of tasks that should be realised by the self-government authorities of the municipality. Pursuant to the Act, own tasks of the municipality consist in satisfying the collective needs of the community, including, among others, the own tasks that

are most commonly estimated in the forecast, i.e. the issues of: real property management, municipal roads, streets, bridges and squares and road traffic organisation, issues related to water supply and the relevant networks, sewage, municipal wastewater discharge and treatment, maintain order and sanitary facilities, landfills and municipal waste disposal, local public transport, physical education and tourism, including recreational areas and sports facilities, municipal greenery and trees and municipal cemeteries. The Report on the economic losses and social costs of uncontrolled urbanisation in Poland (Report..., 2013) states that local spatial development plans in their current form have a faulty functional structure, because the areas designated for residential development are too large and often exceed the needs and economic capacity of the municipalities multiple times. Some local spatial development plans foresee the development of areas, whose demographic absorption capacity exceeds the population of the municipality even ten times. Additionally, a large part of the areas designated for development does not meet the basic requirements for investments, because the municipalities cannot afford to prepare them appropriately. The main objective of this study is to analyse the economic consequences that may be caused by local spatial development plans for the city of Wrocław that identify areas for residential development in the prepared offer. The research referred to the costs of realisation of the provisions of local spatial development plans that may encumber the budget of Wrocław municipality in connection with the housing programme.

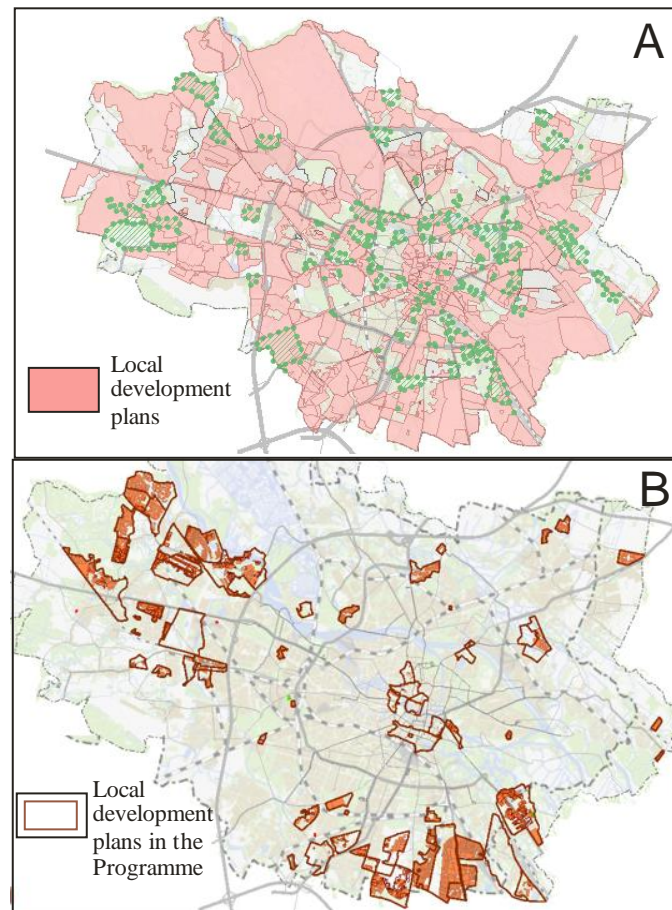
## **2. RESEARCH METHODOLOGY**

The realisation of the objective of the study required the authors to obtain information with use of the direct observation method. Information about the area discussed in the paper was obtained from the disclosed planning documentation, i.e. local spatial development plans, master maps of the area and maps from the Wrocław Spatial Information System. The costs incurred by the municipality budget were identified basing on the provisions of local spatial development plans. Costs of realisation of local spatial development plans identified in the housing programme were determined considering the division most commonly used in literature, according to the following groups (Hełdak, 2013; Cymerman, Bajerowski, Kryszk, 2008; Hełdak, Płuciennik, 2018):

- financial charges for negative consequences affecting real properties (compensations specified in Art. 36, item 1, point 1 and item 3 of the Spatial Planning and Management Act),
- financial charges connected with purchasing real property for the realisation of public goals,
- financial charges connected with the costs of the construction of infrastructure,
- financial charges connected with handling the investment process.

The analysis of costs incurred by the municipality for the realisation of own tasks connected with acquiring real property for the realisation of public goals required the authors to determine average transaction prices basing on data contained in the Real Property Price and Value Register, obtained from the Land Surveying, Cartography and Municipal Cadastre Office in Wrocław. Information about existing transportation networks and utility networks obtained as a result of the analysis of master map enabled us to identify the necessary investment related to infrastructure. The cost of realisation of planned construction works and infrastructure facilities (the construction of roads, land utility networks, development of green areas and construction of educational facilities) was obtained from price catalogues of construction objects. The research area located in the city of Wrocław is presented on the map (Figure 1).

*Figure following on the next page*



*Figure 1: A - Location the local development plans in Wrocław (Poland). B - Location of the areas subject to analysis in terms of the costs of realisation of the provisions of local spatial development plans (area in the Programme for preparing offers of areas for residential development)*

The concept design of the sewage and water supply networks prepared as part of the housing programme of the Wrocław municipality constituted the basis for calculating the length of the network that needs to be developed in order to service new investment areas.

### **3. HOUSING PROGRAMME OF THE WROCLAW MUNICIPALITY**

In response to the urban development needs and the increasing demand for new areas for residential development, the authorities of Wrocław prepared an offer of areas designated for multi-family and single-family housing. The intention of this enterprise was to provide attractive areas for residential development in various parts of the city. The offers included both areas owned by the municipality and those that are in the possession of other entities. Some of the factors that determined the attractiveness of the designated areas, included: the possibility to make them available soon, the differentiation of offers in terms of their type and the nature of planned development, and the fact that specific areas were scattered across the layout of the whole city. The Programme for preparing offers of areas for residential development (2012), foresaw that residential areas for approx. 120 000 inhabitants would be made available. According to the newest demographic forecasts of the Central Statistical Office (GUS), the population of Wrocław will increase by approx. 11 thousand people in the next 13 years (i.e. by approx. 2%) - the population of the city at the end of 2016 was 637 683 people). Wrocław remains one of the few cities, where an increase in population is predicted. At the same time, the housing programme foresees the mobilisation of areas for approx. 120 thousand inhabitants.



The programme is not fully adjusted to demographic prognoses. The main changes in the capital of Lower Silesia concern the oldest age groups and the working age population. Although the group aged 15-64 will remain the largest, it quickly loses its position to the post-working age population. The disadvantageous changes in demographic structure based on age have already begun:

- the share of the working age population will decrease while at the same time the share of the immobile group will grow;
- the process of demographic ageing is progressing (the share of the post-working age group will rise to reach nearly 26%).

#### **4. COSTS OF CONSTRUCTION OF THE SANITARY SEWAGE AND WATER SUPPLY NETWORKS**

##### **4.1. Water supply network**

The analysis of the local spatial development plans designated for the realisation of the housing programme demonstrated that approx. 42 km of water supply network should be constructed. The cost of construction of the water supply network was estimated based on the data from the Construction Facilities Price Bulletin BCO "SEKOCENBUD", vol. II, Engineering facilities from the 4<sup>th</sup> quarter of 2018, volume 70/2018 (1840). Prognosed construction technology: PE-HD pipes Ø 160 mm, cast iron valves, underground fire hydrants, disinfection of pipelines, sand substrate under the pipeline, layer thickness 10 cm (item No. 5566 C. Unit price (per 1 m) of the network, taking into account the regional coefficient (for the Lower Silesian Voivodeship it equals 0,952) is PLN 360 (84 EUR). Thus, the estimated construction cost of the water supply network is approx. PLN 15 120 000 (EUR 3 528 000).

##### **4.2. Construction of sanitary sewage system**

The analysis of the local spatial development plans demonstrated that approx. 42 km of sanitary sewage network should be constructed. The cost of construction of the water supply network was estimated based on the data from the Construction Facilities Price Bulletin BCO "SEKOCENBUD". Prognosed construction technology: PVC pipes Ø 250 mm, concrete circular manholes Ø 1200 mm, sand substrate under the sewer, layer thickness 15 cm, sealing test (item No. 5575). Unit price (per 1 m) of network, taking into account the regional coefficient, is PLN 1200 (EUR 280). The total construction cost of the sanitary sewage and water supply networks is approx. PLN 50 400 000 (EUR 11 760 000). The city has developed a method for co-financing the construction of water supply and sewage networks and road infrastructure. This is due to the fact that the development of housing in Wrocław faces problems resulting from the lack of underground utility structures and road infrastructure. The co-operation offer refers to these areas of the city that were approved for residential development in the municipal spatial policy.

#### **5. FINANCIAL CHARGES CONNECTED WITH PURCHASING REAL PROPERTY FOR THE REALISATION OF PUBLIC GOALS**

The municipality is obliged to purchase land designated for public investments. In connection with the realisation of the provisions of the analysed plans, the municipality Wrocław will have to purchase land in locations designated for urban greenery areas, new communication routes of access road class and local class. However, the areas qualified for the housing programme are mostly locations with good communication accessibility, where most of the roads are already owned by the municipality. The costs of purchasing land designated for access roads in the local spatial development plan were estimated based on the adopted average price per 1 sqm, which was obtained from the analysis of the market of real properties being roads or designated for roads.

This price amounts to PLN 180 (EUR 42) and urban greenery areas PLN 120 (EUR 28). The surface area required to be purchased was estimated based on the analysis of the provisions of plans in connection with the analysis of the ownership status of the real properties. In order for land to be qualified for purchase, it has to be designated for the realisation of public goals in the local spatial development plan. Internal roads constitute a significant part of the communication areas. The entities responsible for the construction of such roads are the owners of adjacent real properties (co-owners of the road). Such solution reduces the costs on part of the Municipality, but it hinders the construction and maintenance of roads, because of the difficulties in reaching a consensus between co-owners of the adjacent land plots with respect to the construction and maintenance of the road. The surface areas and land purchase costs are listed in Table 1.

*Table 1: List of the prognosed costs of land purchase for the purposes of the realisation of public goals*

Item	Land designation for the realisation of public goals	Surface area of land designated for the realisation of public goals [ha]	Prognosed land purchase cost [EUR]
1.	Public communication areas – commune roads and walkways/transport routes	30,00	12 600 000
2.	Public park green areas	25,60	7 168 000
3.	Areas of public educational services	not estimated	not estimated
4.	<b>TOTAL:</b>	<b>55,60</b>	<b>19 768 000</b>

*Source: authors' compilation*

The analysis revealed that the highest costs are connected with the purchase of land for the purposes of the realisation of public roads. The total amount that the municipality may pay for purchasing land for public roads in the given area is approx. EUR 12 600 000. In Germany, betterment levies are charged, considering the real cost of the construction of infrastructure facilities, while in Poland the basis for the calculation of the fee is the increase in real property value. Pursuant to § 128 BauGB in Germany (Ziniewicz, 2012, Hełdak, Pluciennik 2017), the costs of realisation of local infrastructure include:

- the acquisition and preparation of land for the realisation of infrastructure;
- expenditures on the construction of the given investment;
- expenditures on adapting the existing facilities to the local technological infrastructure system (Ziniewicz, 2012).

In England all investors are also charged with infrastructure fees, based on uniformly applied indicators (The Community Infrastructure Levy Communities..., 2008). Apart from those levies, planning obligations and technical infrastructure conditions are binding. In Poland, the Act on Revitalisation introduced the provisions concerning the possibility to co-finance costs that accompany the development as a result of adopting a local spatial development plan for revitalisation. Currently, investors, including developers, often do not bear any costs of the development of technological infrastructure facilities. Moreover, they never bear the costs of the construction of social infrastructure. The expenses related to the construction of educational, cultural, sports and leisure facilities on local level are borne by the municipality budget.

## **6. COSTS OF CONSTRUCTION OF PUBLIC ROADS**

The cost of construction of municipal local roads, access roads and shared pathways for pedestrian and motor traffic were estimated pursuant to the Uniform Standards of valuation of

buildings and structures, Volume 126. The realisation of investment was estimated based on item No. 72 (local roads and squares with mastic asphalt paving) of the following parameters: mechanical trenching, 15 cm thick sand drainage layer, 18 cm thick B-7.5 gravel-concrete substructure, concrete curbs 44,72 m/100 m<sup>2</sup>, 3 cm thick asphalt-concrete paving. The cost of realisation of 100 m<sup>2</sup> of this type of paving, considering the multiplication coefficient for the region (for the Lower Silesian Voivodeship this indicator falls into the range (0.77 - 0.88), the adopted value was 0.80) is PLN 18 831 (4 382 EUR). The paving surface area was calculated based on the measurement of road length from the drawings in the plan (length of roads – 20 km) and the assumed roadway width, which was 6 m. It was determined that the surface area that required paving was 120 000 m<sup>2</sup>. The calculated total cost of construction of municipal access roads in the areas covered by the housing programme was approx. EUR 5 258 400.

## 7. DISCUSSION

The investment areas specified in the housing offer are only a fraction of all areas designated for development in the local spatial development plans that are binding within the administrative borders of Wrocław. Considering that the areas covered by the housing programme may accommodate approx. 120 thousand new residents, there are definitely too many of them. Currently in Poland, in the course of preparing the local spatial development plan, a forecast of the financial effects is also prepared, and new development areas are designed only provided that there is a demand. The needs are determined in the area balance, based on long-term demographic prognoses and on the current designation status of the areas. Considering the prognosed population of Wrocław in the next 13 years, which is supposed to increase by approx. 11 thousand according to estimations, the demand for new areas is rather low. Excessive scattering of development results not only in high costs of providing utility infrastructure, but it also generates numerous additional costs connected with the need to ensure access to community services. The research revealed the costs of realisation of the housing programme (Table 2.).

*Table 2: List of costs of realisation of the analysed Program for preparing offers of areas for residential development*

Specification	Costs [EUR]
Buyout of real properties intended for the implementation of public goals - commune roads and walkways/transport routes	12 600 000
Buyout of real properties intended for the implementation of public goals - Public park green areas	7 168 000
Construction of municipal roads	5 258 400
Construction of paths for pedestrians and cyclists	not estimated
Construction of sanitary sewage system	11 760 000
Construction of water supply system	3 528 000
Construction of a street lighting network	not estimated
Financial impact related to setting up public green areas	not estimated
<b>TOTAL:</b>	<b>40 314 400</b>

*Source: authors' compilation*

The construction and maintenance of municipal roads also generate high costs, connected, among others, with taking over the public communication area in return for compensation, road construction and providing ongoing maintenance works (repairs of the paving, snow removal) (Heldak, Stacherzak, Kazak, 2011). As a result, municipalities adopt various design solutions with respect to the roads designed in the local spatial development plan.

The most common solution is designing internal roads instead of public roads. The realisation of such roads does not belong to own tasks of the municipality so it will not encumber the municipal budget in the future. On the other hand, new problems arise, as it is difficult for a group of several tens or even hundreds co-owners of the road to reach consensus regarding its construction, and later maintenance and repairs. Although such solutions are also present in the housing programme, some of the roads already have a regulated legal status.

## 8. CONCLUSIONS

The conducted analysis allowed the Authors to formulate the following conclusions:

1. The costs of the realisation of the provisions of local spatial development plans included in the Wrocław housing offer are quite significant, although they do not exceed the financial possibilities of the municipality.
2. The main problem of the spatial policy of the city Wrocław is the fact that the surface area of the locations designated for development significantly exceeds the actual demand. The demographic prognosis does not confirm that it is justified to designate such large area (approx. 45 ha) for development, considering the capacity of these areas that may accommodate approx. 120 thousand inhabitants.
3. Preparing a local spatial development plan gives the municipality a possibility to decide about certain costs related to its realisation. As far as communication is concerned, this usually takes the form of searching for design solutions that reduce the costs of realisation of the provisions of the plan. One of the solutions is to designate the necessary communication routes for internal road areas. Such designation releases the municipality from the obligation to build the road, but, at the same time, it hinders the realisation of the communication accessibility goal.

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# THE ROLE OF HAPPINESS IN MODERATING THE EFFECT OF INTELLIGENCE (IQ) ON ECONOMIC GROWTH

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## ABSTRACT

*Empirical studies have established that the national average level of intelligence (IQ) significantly increases the economic growth rate across countries. The current study re-examines the claim that higher levels of happiness have weakened the positive relationship between IQ and economic growth for the 1970 – 2010 period. Using alternative data on national IQ and happiness, this study scrutinises the interaction between national IQ and happiness and their impacts on economic growth for the sample period. Through robust regression, the results of moderation analysis support that happiness had significantly reduced the impact of IQ on growth. As a conclusion, this study suggests that higher levels of happiness tend to reduce people's desire for higher achievement, thereby reducing the impact of their IQ potential on productivity growth.*

**Keywords:** *Economic Growth, Happiness, Intelligence, Moderating*

## 1. INTRODUCTION

The national average level of cognitive skills or intelligence (IQ) is significant in determining the growth of gross domestic product (GDP) per capita. Several empirical studies have established that national IQ is a stronger metric than measures of schooling and life expectancy in raising economic growth (Jones & Schneider, 2006; 2010; Ram, 2007; Weede & Kämpf, 2002). National IQ signifies the average level of cognitive skills of labourers for generating productivity in an economy. People with high IQs offer high competency and efficiency across their jobs and occupations, thus leading to higher productivity in workplaces (Byington & Felps, 2010; Schmidt & Hunter, 2004) and collectively higher GDP per capita at a national level. While many studies suggested that the impact of IQ on productivity is direct, Burhan et al. (2014) suggested that societal level motivation might play a significant role in regulating the effect of IQ on productivity growth. Burhan et al. proposed that people with higher levels of happiness are likely to be more motivated in their economic activities.

Therefore, in treating national IQ as a measure of human capacity or potential to generate productivity, researchers hypothesised that happier societies should be able to generate higher productivity growth than less happy societies with similar levels of IQ. Nevertheless, their findings have found the contrary to be true. Burhan et al. found empirically that “being happier” has reduced the impact of national IQ on economic growth. The researchers, therefore, suggested that people with more happiness tend to be more satisfied in their lives, and are thus less motivated to achieve more. This consequently reduced the impact of IQ on productivity. However, the happiness data employed in Burhan et al. was solely from White (2007), instead of using data from reputed databases, specifically the World Happiness Report (WHR) compiled by the United Nations. White’s happiness data is purely a new construct composed of multiple components of well-being indicators. Rather than using a single accurate measure of happiness like in the WHR, the components of White’s happiness incorporated the measures of schooling, life expectancy and GDP per capita, seeing that these measures are highly correlated with the societal level of well-being and quality of life. Furthermore, Burhan et al.’s analysis employed standard ordinary least squares (OLS) which is not robust against outliers and heteroscedasticity. Although the data has provided an unbiased estimate for the effect of the predictor variables on economic growth, standard errors and hence inferences obtained from regression analysis are suspect (White, 1980). Therefore, the results of hypothesis tests and the ensuing conclusions could be misleading. This study attempts to reduce the potential effect of outliers in the data samples. Temple (1999), for example, strongly suggested the importance of identifying outliers in the cross-country regression, because the samples consisted of a large number of heterogeneous countries. Therefore, the purpose of this current study is to reanalyse the moderating effect of happiness on the relationship between national IQ and economic growth. This paper differs from Burhan et al. (2014) in several ways. First, the happiness data employed are obtained from the World Happiness Report (WHR), which is considered the most accurate to measure a country’s average level of happiness. Second, data on national IQ is extracted from Lynn and Vanhanen (2012), which is the latest date compared to Meisenberg and Lynn’s employed by Burhan et al. Lastly, this study uses the robust t-statistics to determine the significance of the moderating effect. This includes heteroscedasticity correction as well as reducing the effect of outliers in the regression.

## 2. EMPIRICAL STRATEGY

In order to examine the role of psychological well-being in moderating the effect of national IQ on economic growth, this study uses an economic growth model such as that employed in Burhan et al. (2014):

$$\text{GROWTH}_i = \beta_0 + \beta_1(Y_{1970})_i + \beta_2I/Y_i + \beta_3IQ_i + \beta_4X_i + \beta_5(IQ * \text{HAPPINESS})_i + e_i$$

where the dependent variable, GROWTH, designates the annual growth rate of real gross domestic product (GDP) per capita averaged over the 1970–2010 period for specific country *i*.  $Y_{1970}$  and  $I/Y$  are respectively the initial GDP per capita for the year 1970, and the investment as a percentage of annual GDP averaged for the 1970–2010 period. These two predictor variables have been used in prominent economic growth studies (e.g., Barro, 1991; Mankiw, Romer, & Weil, 1992; Minier, 2007). Data on GROWTH and  $Y_{1970}$  were obtained from Penn World Table 7.1 (Heston, Summers, & Aten, 2012), while the data on  $I/Y$  were obtained from the World Bank’s (2013) World Development Indicators (WDI) database. IQ denotes the national average level of IQ obtained from Lynn and Vanhanen (2012). This study incorporated HAPPINESS, which is a set of psychological well-being variables postulated to moderate the impact of IQ on GROWTH, and  $e_i$  is the regression residuals.

Because of the limited data coverage, the data on HAPPINESS were retrieved from the WHR (Helliwell et al., 2018) and were averaged over the 2006–2017 period. This paper hypothesises that each value of HAPPINESS would affect the relationship between IQ and GROWTH. To make this interaction possible, an interaction term (IQ \* HAPPINESS), which is the cross product of the two predictor variables, was constructed and incorporated into the growth model along with the original predictors. This helps determine the significance level of the interaction slope. However, a problem with the inclusion of interaction terms (IQ\*HAPPINESS) is that lower order terms will frequently be highly correlated with their interactions. To overcome this problem, the interaction term was orthogonalised, where the original IQ\*HAPPINESS is regressed on its lower order variables, and the residuals obtained from this regression (with an  $R^2 \approx 99\%$ ) are used to represent the interaction term. Recent economic studies such Balli and Sørensen (2013) and Azman-Saini, Baharumshah and Law (2010) have employed the orthogonalised version of the interaction term.

### 3. RESULTS

Table 1 shows the correlation matrix for all variables. This study found that GROWTH was significantly correlated with IQ ( $r=.48$ ), but was non-significant at 90% level with HAPPINESS. The correlation between IQ and HAPPINESS was high, specifically at  $r=.72$ . These show that, on average, countries with high national IQs have higher levels of happiness and economic growth.

*Table 1: Correlation matrix for all variables (N=107)*

	GROWTH	GDP <sub>1970</sub>	I/Y	IQ	HAPPINESS	IQ*HAPPINESS
GROWTH	1.000					
GDP <sub>1970</sub>	-.039	1.000				
I/Y	.548***	.221**	1.000			
IQ	.477***	.686***	.408***	1.000		
HAPPINESS	.121	.827***	.165	.720***	1.000	
IQ*HAPPINESS	-.209**	.035	-.139	.000	.000	1.000

Note: \*\*\* $p < .01$ ; \*\* $p < .05$ , \* $p < .10$ .

Table 2 presents a summary of regression analyses. Models 1–5 and Models 6– 10 of Table 2 are where regressions are unstandardised and standardised betas, respectively. Based on Model 2, the inclusion of IQ into the regression has increased the adjusted  $R^2$  of the model from 31% to 59%. The magnitude of GDP<sub>1970</sub> also increased from  $|- .480|$  to  $|- 1.851|$  with the inclusion of IQ in the model. These prove that a sufficient amount of human capital (e.g., IQ) has allowed poor countries to grow faster than rich ones because the poorer countries have the ability to emulate the technologies of advanced countries with lower cost (Mankiw et al., 1992). However, the inclusion of HAPPINESS into Model 1 has raised the adjusted  $R^2$  to 40%, as shown in Model 3. When both IQ and HAPPINESS were included into the regression (Models 4 and 9), this study found that HAPPINESS was non-significant towards economic growth at the 90% level, while the effect of IQ was positive and highly significant ( $p < .01$ ). This proves that the relationship between happiness and productivity growth was trivial once the effect of IQ is controlled for. Models 5 and 10 are regressions where the interaction term was considered in the model. It was found that IQ\*HAPPINESS was significant at 99% level towards GROWTH, but with a negative direction.



*Table 2: Summary of regression analysis (N=107)*

Method: OLS with White-heteroskedasticity correction										
Unstandardised Coefficients					Standardised Coefficients					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
GDP <sub>1970</sub>	-.480* (-1.908)	-1.851*** (-8.281)	-1.714*** (-4.208)	-2.143*** (-7.847)	-2.086*** (-7.709)	-.169* (-1.908)	-.651*** (-8.281)	-.603*** (-4.208)	-.754*** (-7.847)	-.734*** (-7.709)
I/Y	.165*** (4.753)	.107*** (4.428)	.168*** (5.357)	.112*** (4.355)	.104*** (4.060)	.585*** (4.753)	.378*** (4.428)	.595*** (5.357)	.396*** (4.355)	.370*** (4.060)
IQ		.103*** (9.294)		.095*** (6.938)	.097*** (7.299)		.770*** (9.294)		.713*** (6.938)	.730*** (7.299)
HAPPINESS			.694*** (4.112)	.221 (1.296)	.188 (1.160)			.522*** (4.112)	.166 (1.296)	.142 (1.160)
IQ*HAPPINESS					-.019*** (-2.837)					-.140*** (-2.837)
R <sup>2</sup>	.327	.600	.413	.607	.626	.327	.600	.413	.607	.626
Adjusted-R <sup>2</sup>	.314	.588	.396	.591	.607	.314	.588	.396	.591	.607

Note: Robust t-statistics are in parentheses. Significance level: \*\*\* $p < .01$ ; \*\* $p < .05$ , \* $p < .10$ .

To check for robustness of the results in Table 2, this study conducted additional regressions such as that presented in Table 3. Models 1 – 4 show the results of the regression where the samples were bootstrapped with 10,000 replications. Specifically, in Model 4, all predictor variables have maintained their significance levels similar to Models 5 or 10 of Table 2. Furthermore, this study performed a robust regression analysis that used the Huber-weight option to reduce the effect of outliers. This ensures that extremely large or small observational values will not bias to the regression estimates. Robust regression employs ‘ROBUSTREG’ command through the M-estimation technique and the Huber-weight option. This procedure is adopted from Huber (1973). The results of robust regression analysis are presented as Models 5–8. In particular, as shown in Model 8, IQ remains significant at  $p < .01$  level towards GROWTH, while the impact of HAPPINESS remains non-significant even at the 90% level. Finally, the robust regression analysis verified that the interaction term IQ\*HAPPINESS was significantly negative at  $p < .05$  on the economic growth of the 1970–2010 period.

*Table 3: Summary of regression analysis (N=107)*

OLS with bootstrapped standard errors (10,000 replications)					OLS with Huber-weight option			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
GDP <sub>1970</sub>	-1.851*** (-7.877)	-1.714*** (-4.166)	-2.143*** (-7.513)	-2.086*** (-7.328)	-1.994*** (-8.316)	-1.765*** (-4.533)	-2.210*** (-6.991)	-2.131*** (-6.714)
I/Y	.107*** (4.318)	.168*** (5.390)	.112*** (4.232)	.104*** (3.884)	.094*** (4.927)	.178*** (8.069)	.097*** (5.065)	.093*** (4.783)
IQ	.103*** (8.778)		.095*** (6.752)	.097*** (6.972)	.106*** (8.860)		.100*** (7.657)	.101*** (7.679)
HAPPINESS		.694*** (4.022)	.221 (1.305)	.188 (1.147)		.714*** (3.962)	.173 (1.095)	.146 (.922)
IQ*HAPPINESS				-.019*** (-2.736)				-.019** (-2.261)
R <sup>2</sup>	.600	.413	.607	.626	.678	.475	.676	.693
Adjusted-R <sup>2</sup>	.588	.396	.591	.607	.669	.459	.663	.678

Note: Regression coefficients are unstandardised betas. T-statistics are in parentheses.  
 Significance level: \*\*\* $p < .01$ ; \*\* $p < .05$ , \* $p < .10$

#### 4. DISCUSSION

This study reassessed Burhan et al.'s finding regarding the role of happiness in moderating the impact of national IQ on economic growth at a cross-country level. The results of the regression analysis showed that IQ was highly significant to increase the growth rate of GDP per capita. However, the strength of this relationship reduced as societies achieved higher levels of happiness. This conclusion is supported by the significantly negative effect of the interaction term ( $IQ \times \text{happiness}$ ) towards economic growth, as proven through the robust regression. The finding implies that the positive relationship between national IQ and economic growth is weaker across countries with higher levels of happiness but stronger across less happy societies. The findings of this study indicate that enhanced levels of happiness reduced people's aspiration for higher life achievement, and thereby decreased the impact of national IQ potential on productivity. Along the same lines, it is worth suggesting that happiness is highly associated with a society's fulfilment of needs. People tend to be happier when their needs are satisfied. As advocated by Maslow (1970) and Heylighen (1992), people become less motivated once their needs are satisfied, as these needs are no motivators for them to put more effort towards realising further life achievement. Thus, in relation to this study, higher levels of happiness lead to decreased motivation, which reduces the impact of human capacity, specifically the national IQ potential on economic growth. The conclusions of this study suggest an intervention whereby workplaces should provide employees with not only a happy environment but also an environment that motivates them to utilise their IQ potential fully to generate higher productivity in the long-term.

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## EXPLORING CONSUMERS RELIANCE ON PLASTIC IN FRESH FOOD PACKAGING: ADDING TO THE WASTE?

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### ABSTRACT

*This paper joins the vibrant conversation on the unprecedented scale of the use of plastic in order to package, transport and aid the consumption of fresh food. Specific focus is placed how the UK government's plastic free aisle pledge, highlighted in the 2018 25-year sustainability plan, may have an impact on the already increasing levels of food waste in the UK. The current literature fails to recognise the need to evaluate the reliance consumers have on plastics in the purchase, transport and consumption of fresh food products. As a result, it is therefore difficult to evaluate the impact the UK government's plastic free aisle pledge will have on food wastage. In order to understand the possible roles, relationships and reliance consumers have on plastics in the purchase, transport and consumption of fresh food, this study followed an inductive approach. Thus, building on existing research in order to conceptualise how consumers' thoughts and behaviours interrelate with the use of plastic when purchasing, transporting and consuming fresh food and the potential impact this could have on food wastage. The findings of the study indicated consumers strongly rely on plastic packaging as a mechanism in which to preserve fresh food, in order to maintain the quality for as long as possible. Yet the results suggest consumers unconsciously rely on the information presented to them on packaging, such as best before dates. Such statements thus seem to skew consumers' views on what is edible vs. what should be thrown away. This therefore suggests there is a confusing role between plastic packaging preserving food as well as it increasing the wastage of food. The study concludes that the effect of removing plastic from fresh produce could be somewhat negative as the guidance consumers rely on is also removed. There is thus a need for further consideration with regards to the operational impacts of the removal of plastic as well as the possible perseveration techniques. A need for immediate consumer education surrounding food handling and consumption, to minimise consumer ambiguity and the growing culture of reliance on information on plastic packaging is also recommended to help reduce food wastage.*

**Keywords:** *food wastage, plastic food packaging*

### 1. INTRODUCTION

The UK has come to the sudden realisation that there is an urgent need to change consumption practises (Krishnamurthy, 2015). Britain has continued to fall behind its European counterparts placing 12<sup>th</sup> in 2017 from 4<sup>th</sup> in 2016 in the ranking of sustainable countries (RobecoSAM, 2016; Smith, 2017). The UK lives in a "three planet lifestyle" (WWF, 2018), if Britain's current consumption rate was replicated across the globe, the resources of three whole planets would

be required just to sustain such behaviour. Current consumption therefore calls for a holistic approach considering economic, social and environmental aspects and their interlinkages to successfully mainstream sustainable development (United Nations, 2012). Though a significantly delayed response, such thinking lends itself to the works of Elkington and the renowned triple bottom line framework (Elkington, 1994; Slaper, 2011). One resource used excessively is plastic. UK supermarkets alone produce more than a quarter of the country's plastic waste (Fearnley-Whittingstall, 2018), with packaging producing 2.4 million tonnes per year (Wrap, 2018). Recent exposure to the impacts of plastic pollution, has caught consumers attention with nine out of ten people calling for plastic free food products (Johnston, 2017). The growing awareness of excessive plastic use has pushed for UK Government intervention, resulting in the creation of a 25-year sustainability plan. In the document, focus is placed on "eliminating avoidable plastic waste" (HM Government, 2018, p.83) with the implementation of "plastic-free supermarket aisles in which all the food is loose." (HM Government, 2018, p.88). The plan is a progressive step in reducing plastic pollution but, what does this mean for food sustainability? Plastic has become a key asset in the presentation of fresh produce in supermarkets, playing a primary and secondary role, for preservation and product information. Such uses of plastic are ultimately used as a way of leveraging consumption efficiency for consumers. Therefore, there is a need to assess consumers reliance on plastic's presence in consumption. Consequently, we must investigate if the Governments suggestion is a misinformed pledge whereby plastic is being prioritised over food waste, in particular fruit and vegetable waste; which is equally as important of a sustainability issue. The UK household already produces 7.3 million tonnes of food waste annually (Wrap, 2015) with 42% of the waste being fruit and vegetables (Lipinski, Hanson and Lomax, 2013, p.6). When comparing these figures to the amount of people suffering from food insecurity in the UK which is 8 million (Butler, 2016) along with the growing population rate, there is a vital need to research what impact this plastic free aisle pledge will have on fruit and vegetable waste. To see if it will make the UK's 'throwaway culture' (Hughes, 2018) better or worse.

## **2. THE LITERATURE**

Two themes were pulled from the existing literature, balancing sustainability and consumption theory. 'Balancing sustainability' discusses the role that plastic packaging plays in fruit and vegetable consumption, with focus on preservation and information and the extent to which these roles are relied upon by consumers. This is a vital theme to understand to be able to set a basis of the potential impact that the removal of plastic will have on fruit and vegetable waste. Once discussed, consumption theory and the consumers role in sustainability can be assessed. It is important to understand this framework so that we can establish why there is an excessive amount of fresh produce waste within the UK and how this insight can help smooth the transition into the potential plastic free purchasing of fruit and vegetables.

### **2.1. Balancing of sustainability**

The role of plastic packaging is separated into two functions, the primary and secondary role. The primary role of plastic packaging is to protect produce from damages and outside influences (Marsh and Bugusu, 2007; Velez, 2015) and is therefore used as a preserving agent (Williams et al., 2011). However, a large extent of fruit and vegetables have their own protective layers deeming plastic use unnecessary (Hunt, 2017). Therefore, reinforcing the significance of the Government pledge. The secondary role, however, is disputed in current literature and therefore needs to be analysed. This role is enforced to meet the needs of the 21<sup>st</sup> consumer, by providing information and convenience through packaging. Ampuero and Vila (2006) personifies packaging to be the 'silent salesman' that makes markets work efficiently. However, given the substantial amount of fresh produce waste, the effectiveness of the silent salesman role must be

explored. There is a general assumption that food packaging is a key instrument for reducing food waste (Velez, 2015) and that it favourably improves the sustainability of the food chain (Aschemann-Witzel et al., 2015). Wrap (2013) notes that providing consumers with clear and consistent information on packaging helps to reduce waste in the home. Though, Giroto et al (2015) states that food waste is caused by consumers lack of knowledge on storage and shelf life. Yet, this information must be provided on fresh produce packaging (Gov.uk, 2018), signifying a possibility that consumers pay little attention to the information supplied. We can assume, that the removal of plastic in fresh produce aisles would make little difference in behaviour and food waste, if consumers do not currently acknowledge the information being presented to them. Therefore, reinforcing the need to re-evaluate the role that plastic plays in consumption. 50% consumers also recognise that the packaging used in supermarkets is 'bad for the environment' (Wrap, 2013. P, 3) reiterating the reasoning for the government pledge. If consumers recognise plastic's impact on the environment it emphasises the assumption that consumers are willing to go plastic free. The pledge therefore lends itself to the notion of reinforcing traditional consumption practises of fresh produce being sold loose, in its natural form (Clay, 2014). This demonstrates a reason to understand if there is a role that plastic needs to play in fruit and vegetable 21<sup>st</sup> century consumption. Though, consumers' willingness is not efficient if not harmonised with awareness. Williams et al (2011) found that consumers knowledge about how packaging affects food waste is scarce. This suggests one of three things, either that there is an extreme imbalance of focus, placing more importance on the environmental impacts of plastic than food waste (Chadwick, 2018). That if knowledge is scarce, removing plastic would make little difference to food waste as previously discussed, or, that the severe lack of knowledge in this area needs to be addressed through education before the removal of plastic to mitigate any potential increases in food waste. Silayoi (2004, p.1500) adds that packaging information can create confusion by conveying too much or misleading information. For example, date labelling has been said to create confusion over quality (Wilson et al., 2015), Wrap (2013) found that this created 17 billion '5-a-day' portions of waste. So, the inconsistencies in the literature implies a need for further research to define plastic's role in consumption and the extent of consumers reliance and possible confusion to accurately predict the impact of the plastic free aisle pledge.

## **2.2. Consumption theory**

Martin (2007) suggested that 21<sup>st</sup> century UK consumers have become drivers of overconsumption, displaying ignorance in behaviour. This is supported by Hofstede's study, finding that the country has a 69% rating in 'indulgence' (Hofstede, 2018). This provides inexcusable explanations for high statistical fresh produce waste; wasting 42% of fruit and vegetables annually (Lipinski and Hanson, 2013, p.6). Such assumptions would suggest that consumers play an active role in creating waste. Wrap (2007) research supports this idea with research that found that 60% of consumers believe that food waste is not a concern because it is natural and biodegradable. Schor also supports this idea, arguing the ecological bias. The bias informs that ecological resources are perceived as free goods thus, these resources can be exploited because they weren't monetarily bought (Schor, 2001). This would provide reasoning for the extreme wastage in fruit and vegetables, given that they are a natural grown resource. Though, the theory only considers resources from a natural accessibility value basis and fails to consider the costs of such 'free' externalities, the same criticism can be said to the 60% of consumers who justify produce waste. However, these negative theories of consumers consumption practises may not be representative now considering the time of the research and evolving behaviours and perspectives, for the Government pledge would not have been implemented without the demand from society. But then, as highlighted, the pledge is a result of a concern for excessive plastic use therefore we need to understand consumers opinions on

fresh produce waste; which as highlighted, is equally as important of a sustainability issue; only then can the Government's pledge be analysed. Therefore, new research must be conducted to reassess consumers views, to see if fresh produce waste is now perceived as a greater concern, much like the growing concern for plastic uses; rather than using outdated theories and generalised trends. However, Howard's (2001) suggests that consumers satisfy themselves and 'do good' at the same time. This statement lends itself to the emerging trend of the 'conscious consumer' and 'green consumption' (Peattie, 2010). However, Peattie (2010) proposed that the ideology of 'green consumption' is somewhat of an oxymoron as green generally implies conservation whereas consumption often means destruction. This ideology reinforces the contradiction found in the current literature and therefore initial research problem discussed; that consumers portray a concern for a lack of sustainable practises, through the amount of plastic usage, yet produce vast amounts of waste in fruit and vegetables. Therefore, the attitude behaviour gap should be addressed to understand the reason for the gap in consumers active concern and yet lack of active behaviour and if this 'conscious consumerism' is selective in it regards to consumption and waste. The attitude behaviour gap is when there is a discrepancy between attitude and behaviour (Vermeir and Verbeke, 2007). Vermeir and Verbeke (2007) looked at sustainable food consumption and suggested that when consumers felt they lacked resources to perform a behaviour, they were unlikely to form strong intentions to perform that behaviour. However, it can be argued that we are already facing a potential lack of resources in terms of food security, with one in ten in the UK suffering (Butler, 2016) yet we are consuming at an unreasonable pace; reiterating the notion of a collaboration of greed. This reinforces the need to understand consumers thoughts regarding excessive waste in fresh produce consumption.

### **3. AIMS AND OBJECTIVES**

#### **3.1. Aim**

The aim of this study is to evaluate the balance and impact that plastic free aisles and therefore fresh produce being sold loose in supermarkets will have on consumption and food waste.

#### **3.2. Objectives**

1. To critically review the literature concerning consumption through packaging.
2. To investigate the role plastic plays in consumption.
3. To assess consumers reliance on packaging information and their thoughts and feelings regarding the consumption of fresh produce.
4. To discuss the implications of the reduction of plastic and its impact on fresh produce consumption from a consumer perspective and to make recommendations to Government, business and academia.

### **4. METHODOLOGY**

An inductive approach was taken in this study. This was decided based on building upon existing theory regarding the relationship between plastic and food waste and its link to the newly proposed Government pledge. The inductive method creates a narrative description (Greene, Caracelli and Graham, 2010) of the given relationship, leaving potential to discover uncovered topics and to create new theories regarding the relationship between plastic packaging and food waste. An experiment and questionnaire was conducted in a complementary manner, therefore using a concurrent mixed method research technique to generate both quantitative and qualitative data.

#### **4.1. Experiment**

An experiment was used to investigate the role that plastic plays in fresh produce consumption and waste. Using a convenience sampling method (Saunders, et al., 2012, p.270) a household of two middle class adults were used. The method allowed a high level of immersion, recording data in the authentic environment of the home where food waste was generated, increased the study's external validity (Hakim, 2000). The experiment used a repeated measures design (Saunders, et al., 2012, p.176) keeping plastic packaging in the first trial and removing it in the second, to assess whether there was a connection between plastic packaging and the level of food waste produced over two sets of ten days. The dependant variable was the consumers waste production and the independent variable was whether fresh produce was stored in its original plastic packaging or loose (Hakim, 2000). The fruit and vegetables used were controlled, using the same items in both trials (see appendix 1). To record data, participants kept a food diary, to quantify wastage and qualitative reasoning. Informant verification was used at the end of each ten days to avoid observer bias (Saunders et al,2012 p.352). To analyse the diary data a method of transcript analysis (Brinkmann and Kvale, 2009) and thematic coding, was used (Male, 2016). Transcribing the food diary provided the ability to contextualise patterns and themes in plastic and non-plastic consumption. The waste was totalled numerically by item for each trial.

#### **4.2. Questionnaire**

An internet-mediated self-completed questionnaire was used to understand consumers reliance on packaging and in particular their attitudes regarding consumption. The questionnaire was created on type form, released for three weeks and posted on LinkedIn, Social medias and via email, allowing for a wider access of potential respondents (Coomber, 1997, Dillman et al., 2009) and therefore generalisability. The Governmental pledge, if enforced, would impact all consumers, so the data needed to be representative. The questionnaire received 79 responses, with a 100% response rate. The sample used was convenience (Saunders, et al. 2012, p.270), using participants of twenty-one and over to avoid uniformed bias (Saunders, et al. 2012, p.420). The questionnaire featured open, closed and ranking questions (see appendix 2b). These questions generated quantitative data, which allowed for statistical analysis (Saunders, et al. 2012, p.475) and qualitative information to support and enhance the statistics gathered, thus providing meaning (Saunders, et al.2012 p.163). Statistical data (Sparrow, 1989) and explorative analysis was used to produce visual aids (Whitey and Ball, 2001) to interpret and display the quantitative data. Lastly, Summarising was used to categorise the qualitative data (Male, 2016) so that reoccurring justifications could be highlighted. The methods combined creates a synergy effect. Using the questionnaire findings of consumers perspectives alongside the experiment results of consumers behaviours, leverages the ability to understand the attitude behaviour gap therefore providing clarity as to why the 'gap' exists, as well as understanding consumers reliance on packaging. This then allows for opportunities to address and close the gap and build on existing literature regarding consumer reliance on the primary and secondary role, leaving potential to minimise negative consequences of the Government pledge.

### **5. FINDINGS**

#### **5.1. The experiment**

Overall, the experiment data showed that more waste was generated in the first trial when produce was kept in packaging than when stored loose. The plastic covered produce trial produced  $8\frac{3}{4}$  of item waste whereas the plastic free produce trial generated 5 items of waste. Two themes were found for each trial as a result of thematic coding, see table 1. In the first experiment, when produce was kept in plastic packaging, the participants relied on date labelling and therefore product information as a way of evaluating the edibility of produce.



The participants also used their senses by evaluating the look and texture of the fruit or vegetable to determine if the produce should be consumed or wasted. In the second experiment, when produce was stored loose the senses theme was regenerated, more so in the second trial than in the first. The theme of deterioration was also present in the second trial, though closely linked to the sense theme, this theme focused on the rapid decline of the health of produce.

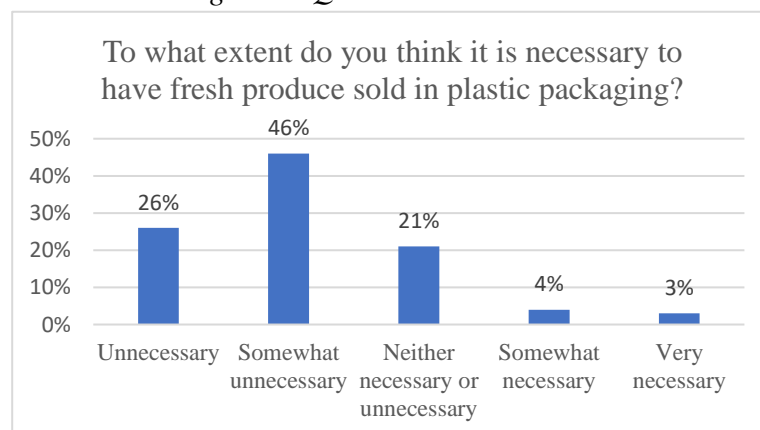
*Table 1: The experiment*

<b>Trial</b>	<b>Theme</b>	<b>Number of occurrences</b>	<b>Evidence</b>
Experiment 1 Plastic covered produce	Date labelling	6 ½	"Gone past the date on the packaging"
	The senses	4 ¾	"They looked old" "Felt extremely soft" "Texture looked squishy"
Experiment 2: Plastic free produce	Deterioration	4	"went off quickly" "The leaves rapidly began to wilt"
	The senses	5	"tasted soft" "soggy"

## 5.2. The questionnaire

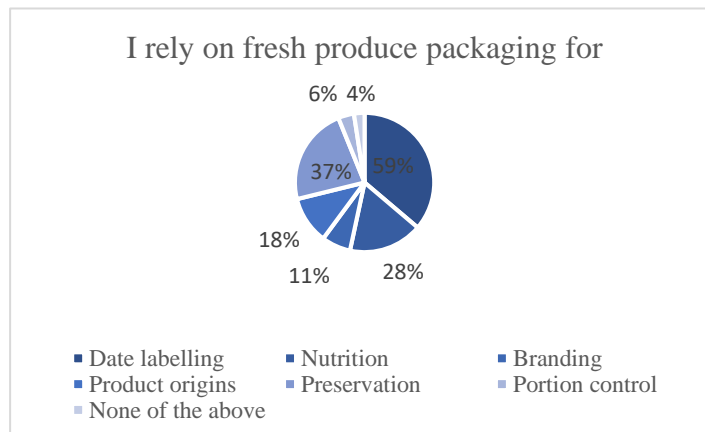
The questionnaire generated 79 responses, with a completion rate of 100%. The questionnaire results have been presented using explorative analysis. To summarise, fresh produce sold in plastic packaging was considered somewhat unnecessary by 46% of participants and unnecessary by 25%. 55% of participants were found to rely on packaging for date labelling, followed by 37% for preservation. Lastly, 92% of participants believed the government pledge is a good strategy with only 8% disagreeing.

*Figure 1: Question 1 results*

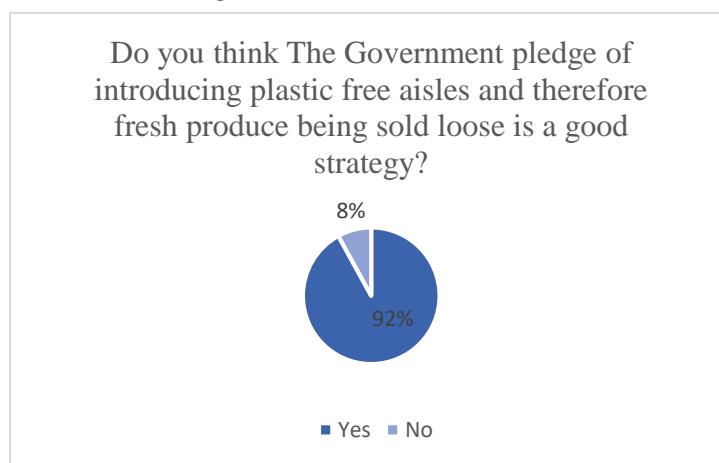


*Figure following on the next page*

*Figure 2: Question 2 results*



*Figure 3: Question 3 results*



## 6. DISCUSSIONS

The results show that there is a reliance on plastic packaging in fresh produce consumption for both the primary and secondary role. However, there is more reliance on the primary role rather than the secondary. The primary role aids consumption whereas the secondary role, misleads.

### 6.1. The primary role

The research shows that the primary role of plastic packaging is heavily relied upon by consumers. Referring to the questionnaire results, 37% of consumers said that they rely on packaging for preservation. Further, in the experiment, only when produce was stored loose was the theme of deterioration present, with evidence that the food health declined “quickly”. Such findings support the existing literature discussed, that packaging protects products from damage and outside influences (Mars and Bugusu, 2007; Velez, 2015). The waste created in the experiment as a result of produce deterioration, supports Barczak (2016) who said that “packaging minimises produce waste”. This study builds upon Wrap (2013) research who found that only 22% of people acknowledged that packaging extends shelf life. Here then, contribution is made showing an increase in consumers understanding of the relationship between plastic and food waste; thus, showing a progressive change in sustainable behaviour amongst consumers. The results at first glance then, would suggest that The Government pledge poses a further threat to the amount of food waste produced because the removal of plastic threatens the shelf life of produce, shortening consumption time and increasing the potential of damage (Corbin, 2018). Furthermore, such preservation aids are driven by consumers to meet

fast pace lifestyles (Labuza and Breene, 1989, p.2), so there is need for shelf life extension to ensure consumption is fulfilled and to minimise opportunities for household wastage. However, the pledge provides opportunities to evolve consumption practises by applying nudge theory (Thaler and sunstein, 2008). By making changes to the physical environment (Cooper, 2017), by removing plastic from produce, overconsumption can be reduced. If consumers are able to acknowledge the link between plastic acting as a preserving agent of fresh produce, as displayed in the results, then they will recognise that when plastic is removed, produce will have a shorter life expectancy and therefore will be unlikely to over purchase. This strategy would combat the excessive consumption discussed in the literature, further reducing food waste. Nevertheless, the removal of plastic would undoubtedly impact other parties of the fresh produce journey, from farm to fork. For example, supermarkets may face the challenge of sustaining quality without packaging. Therefore, a holistic approach needs to be taken to understand the operational impact of the pledge. Thus, further research is needed to gain a wider perspective on the pledge.

## **6.2. The secondary role**

In the questionnaire results participants showed a reliance on the secondary role for information purposes. In the experiment 6 ½ items of produce were wasted based on date labelling and in the questionnaire 59% of participants said they relied on packaging for date information. These results support the existing literature, that providing consumers with packaging information is beneficial to consumption (Wrap, 2013) and therefore leverages consumers ability to make decisions regarding fresh produce edibility. This would first indicate that the removal of plastic would have a negative effect on consumption as consumers would feel that they do not have sufficient knowledge or the right guidance regarding consumption abilities and therefore would result in waste. However, in the experiment when plastic packaging was removed and therefore packaging information could not be relied upon, consumers were able to use self-assessment using their senses. In fact, the senses theme was present in both trials. This suggests presence of the anchoring bias, whereby consumers rely on the first piece of information presented to them, for when consumers experience information overload, they will choose the most readily available option (Cooper, 2017). Here then, the waste created in the experiment as a result of relying on date information may have been misled, which resulted in unnecessary wastage. Therefore, the packaging information overrides consumers ability to use self-assessment. This assumption directly links to existing literature that the information on packaging creates confusion (Williams et al, 2011) and the perception of quality (Wilson et al, 2015). Therefore, the general assumption that packaging is a key instrument for reducing waste can be challenged, for it may increase shelf life but contradicts the primary role function by confusing consumers with unnecessary information resulting in waste. This directly links to Clay's (2014) argument that produce is becoming commercialised through packaging but is still primarily bought for its commodity status; in this process consumers perceptions are blurred. This view built of consumers is different from the initial literature drawn, that fresh produce waste is a result of consumers ignorant consumption. Therefore, it can be added to the literature that consumers behaviour is not solely intentional, as this is still a factor that must be acknowledged, but also due to confusion. When applying the works of Geller's behaviour change model (Yun et al, 2013), consumers can be said to express an unconscious incompetence of sustainable behaviour regarding consumption. However, this is not solely due to excessive consumption practises but also because they have been misled and therefore are not confident in the consumption of fresh produce. This builds a bridge between the attitude behaviour gap, as the gap is created as a result of ambiguous information. Removing plastic therefore leverages the opportunity for consumers attitudes to match their behaviours if they are able to use their own self-assessment and consciously make decisions regarding fresh produce consumption.

## **7. RECOMMENDATIONS**

### **7.1. To Government**

- To update the 25-year sustainability plan with a strategy to explore and invest into fresh produce preservation technologies, to ensure that shelf life and protection of produce is not threatened after the plastic free aisle pledge is enforced.
- To make food preparation a compulsory subject across UK education establishments to minimise ambiguity and confusion in fruit and vegetable consumption.

### **7.2. Farm to form process operations**

- To liaise with parties involved in the produce life cycle to formulate a plan to pre-empt government regulation.

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# THE ENGINE OF BUSINESS PERFORMANCE: THE ROLE OF TRUST IN THE MANAGERIAL CONTEXT

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## ABSTRACT

*From the 1950s onwards, trust, as a concept has served as an untapped resource for countless disciplines. Several fields of science, from several perspectives examined trust as a phenomenon and the impact of the lack of trust in different context. These issues identify the most important research areas in the scientific world that have focused on trust in recent decades. In our accelerating economic world, building and maintaining trust is primarily necessary to strengthen the economic performance of companies. Researchers sought to answer the following questions during their scientific research: Why is research of trust important, how can the organization recognize a trustful atmosphere, how can trust be built up, what advantage does a company get if the workers have trust in the organization or how large is the damages if the company has not sufficiently invested in trust. This article is an extended literature review in connection with the concept of organizational trust, which defines a problem area in the relationship between knowledge management and leadership. In our study, we researched scientific journals by using the phrase organization trust as the keyword, and within these, we highlighted the areas of research where the most significant relevant scientific literature was to be found, which was in close connection with our research field. The aim of this article is to summarize the most important issues of this literature, which have been studied within each discipline. The conclusion from this literature identifies a positive correlation between economic performance and organizational trust; its measurability can be the key question for companies. In our study, we appointed the measurability of trust as the goal of future research.*  
**Keywords:** knowledge management, leadership, measurability, trust

## 1. INTRODUCTION

The definition of trust in the various fields of science has become part of the literature since the middle of the last century. The research and analysis of the role and effect of organizational trust have a history of more than fifty years. Numerous organization scholars have emphasized the importance of trust in organizational settings, but all of these researchers have analyzed the role of trust in a slightly different way, from another scientific approach or in different contexts, but one element nevertheless is common in these researches: the role and importance of trust in an organization are indisputable. According to interesting scientific research from the University Institute of Lisbon, there are five hormones in the human body responsible for our sensations and emotions. The researcher states the combination of these hormones has a positive correlation with the level of organizational trust because of the chemical reactions to the different emotions. For this reason, they measured with qualitative research the relationship among the different chemicals, leadership, motivation and organizational trust. The inspiration for this research came from the different feelings from a different work environment where the employee can feel the trust or lack of trust (Zak, 2018; Ferreira, Costa, Pereira, Jerónimo, Dias, 2018).

Zak (2018) identify oxytocin as trust hormone and Sinek (2016) provide with the logical way the indirect connection between the environment, leader behavior and motivation. He describes and emphasizes if the leader behavior causes trust in the workers, the level of oxytocin increase in the human body and the level of motivation increase as well (equilibrium theory).

## **2. DEVELOPMENT OF THE TRUST DEFINITION**

During these more than fifty years of trust research, science has defined trust in many ways. Cook and Wall (1980) defined organizational trust as “the extent to which one is willing to ascribe good intentions to and have confidence in the words and actions of other people”. Carnevale and Wechsler (1992) identified the definition of organizational trust as that it “involves faith or confidence in the intentions or actions of a person or a group, the expectation of ethical, fair, and non-threatening behavior, and concerns for the rights of others in exchange relationships”. Mayer, Davis and Schoorman (1995) mentioned the term of trust as it refers to “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party”. Dietz and den Hartog (2005) concluded that “trust as a belief, as a decision and as an action” (Bakker, Leenders, Gabbay, Kratzer, Engelen, 2006) and Mayer (1995) and Gabbay and Leenders (2003) defined trust as “a set of beliefs about the other party (trustee), which lead one (trustor) to assume that the trustee’s actions will have positive consequences for the trustor’s self” (Bakker, Leenders, Gabbay, Kratzer, Engelen, 2006). As the number of researches related to trust increases, the study areas and topics have started to develop dynamically. While in the 1980s most of the studies looked at the impact of trust on workers (Cook, Wall, 1980) and they focused the long-term maintenance for an organization, in the early nineties, relationships with leaders were already being studied (Carnevale, Wechsler, 1992). After the turn of the millennium, the impact of trust on economic performance and financial gain has also shone in the spotlight, which is also the basis for long-term sustainability. Examining this relationship is a key element of survival in the global economy (Lams, Pucetaite, 2006). In addition to the key actors in building confidence in an organization, the chosen articles on trust research gather around two approaches: psychological and social approaches. From a psychological approach, Fehr (2009) described the trust: “Trust plays a role in almost all human relationships.” (Lusher, Robins, Pattison, Lomi, 2012). Lusher, Robins, Pattison, and Lomi have collected on trust relations within the top management team of a multi-unit industrial group and have modeled the expressed and perceived trust relationship in organizations. They proved the effect and role of trust with the mathematical model and suggested that the building and breaking of trust based on a psychological mechanism. They stated that 171 collected articles write about trust in organizations that have published over the last 48 years (McEvily and Tortoriello, 2011). In these articles the researcher found 129 different measures of trust and they state in their work that “disagreement on measures notwithstanding, two identifiable trends seem to characterize contemporary research on trust (and distrust) in the organizational context” (Lusher, Robins, Pattison, Lomi, 2012). The definition of trust in social scientific studies is different from the psychological approach. Trust has been identified as “one of the central constructs in inter-organizational relationships” (Smith, Barclay, 1997) and it was described and examined in the different level of the organization. In an article from Baek and Jung was identified two important implications of trust. First, they stated there is “sequential order between different types of trust in organizational settings. Second, interpersonal trust promotes organizational commitment only if it facilitates institutional trust.” (Baek, Jung, 2018) They separated two types of trust in an organization: interpersonal trust and institutional trust and in these two groups have modeled the effects of trust with a mathematical method. However, there are regardless of the different approaches and definitions in connection with the term of the trust,

the concept or basis of the general definition was serviced by Rousseau for the scientific world. Rousseau state in 1998 that "psychological state comprising the intention to accept vulnerability based upon positive expectation of the intentions or behaviors of another" (Baek, Jung, 2015). Fukuyama, as the major researcher of this scientific area, analyzes in his book *Trust: The social virtues and the creation of property* (1995) the role of trust and the social capital is the different countries and nationalities. He describes culture "as a major contributing source and explanatory variable of varying prosperity around the world". (Quddus, Goldsby, Farooque, 2000) The book makes significant differences between the social behavior of the people in different countries and he prove that these differences in the behavior of cultures appear in all areas of business. Although countless scientific researches describe the importance of the concept with various methods and mathematical models, their use is often difficult in everyday business life. Several factors affect the lives of economic operators (eg. the cooperation of multiple cultures within an organization, personal internal conflicts of interest) which make it difficult to build and maintain trust. However, this activity is a major element of the daily business in a company, it serves for a basis of knowledge sharing and continuous development as well. Based on our chosen scientific articles we summarized the most important research field in the studies, but not all scientific examination is covered, this serves only as a sample to this short summary. For our analysis, we have chosen two concrete research areas: leadership and knowledge management, because these are the two scientific areas what we will analyze deeper in connection with trust in our later research with empirical analysis and case study method.

### **2.1. Trust in the organizational context**

Over the past 150 years, the image and concept of the leader have changed from time to time. These changes are mainly induced by environmental factors such as the political system of each country, the economic situation, technological development and generational changes that have emerged as a result of the present age. Although leadership as practice has existed since prehistoric times, leadership theory models can be regarded as young. Changes in the characteristics of the leadership role also followed this trend. The chronological changes of the visionary approaches such as the classical viewpoint, the human-centered viewpoint, the modern or the post-modern approach, have given managers new attribute and competence for the leading role according to the current driving characteristics and directions. During the last three decades, ethical and transformational leadership get an important role in leadership styles. More studies examine the positive effect of this leadership within the different companies and in a different context. Ethical leadership is described in the literature as follows: "an effective predictor of job satisfaction, organization commitment, moral identity, voice behavior and organizational citizenship behavior" (Brown, 2005; Brown, Trevino, 2006) and the ethical leadership was defined as "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two-way communication, reinforcement, and decision making (Brown, 2005). Brown and Trevion describe the ethical leaders as "who have the following characteristics: honesty, integrity, care for others, altruism, visibility, group determination, reliability, supporting proper rights, along with their particular conduct as principled folks who create well-balanced judgments". Bass (1985) as the most famous researcher in the transformational leadership described the leader as a motivator who able to inspire, stimulate and empower people to a common goal. He specified the following characteristics: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, and through these characteristics and empowering abilities, the transformational leader can build more efficient organization than the other leadership styles, it is an effective form of leadership. Bass defined the transformational leaders "as those motivating their followers to move beyond their

individual self-interests for the good of the group, organization, and society" (Muchiri, McMurray, Nkhoma, Pham, 2019); Birasnav, Rangnekar and Dalpati (2011) emphasized "transformational leadership is one of the most effective leadership styles for enhancing knowledge capital, human capital" (Le, Lei, Phouvong, Than, Nguyen, Gong, 2018) and some other scientific studies examine the employee behavior, trust, leadership style and employee performance in a common examination group. My chosen studies have focused on the relationship between ethical leadership behavior, organizational trust, and employee performance, and these studies emphasized the positive relationship between the ethical leadership, the ethical work environment, and the organizational trust as well. The role of trust appears as a key factor in the functioning of the organization. Several studies research and analyze the impact of trust in two or three indicators as motivation or employee engagement. "A key challenge for managers seeking to promote subordinate cooperation is that they must manage the inherent tensions between control and trust. These tensions exist because control and trust motivate individuals through related but distinct and often opposing psychological mechanism." (Long, 2018) Long have stated in his research that leaders have a significant role in building trust. He has pointed out the importance of this and the insights of trust levels at each level of leadership. In his examination he used twenty-two in-depth, semi-structured interviews that were conducted with practicing managers who were also members of an executive MBA program in the eastern United States. He examined in the interviews the variety of the managerial role in connection of the building trust.

## **2.2. Trust in knowledge sharing and creativity**

In our current accelerated world, quick response, good ideas and effective teamwork can be key issues, within the knowledge sharing can help to fulfill the customer needs and avoid the problems in this everyday competition. New ideas and innovativeness of a company could be a key determinant in this platform. Most scientific research has examined the impact of ethical leadership on innovation and creativity, which is motivated not only by academic life but also by practice as well. Some studies prove with different methods the direct relationship between the leadership style and employee creativity. "Ethical leadership is seen as one of the main driving forces in developing and sustaining a culture of creativity" (Javed, Kahn, Bashir, Arjoon, 2016) and the evidence this direct connection not only in the positive understanding but in the negative aspect as well. Hence, there is a positive relationship between ethical leadership and employee creativity and innovation, and there is a negative correlation between the authoritative leadership style and employee creativity as well. According to the chosen studies the knowledge sharing as a term was described as the following: "the process of exchanging information among individuals to create a valuable knowledge base for one another" (Le, Phouvong, Than, Nguyen, Gong, 2018) and defined as the key element of the knowledge management. Study by Reid (2003) state that "knowledge sharing creates opportunities to maximize organization ability to meet those needs and generates solutions and efficiencies that provide a business with a competitive advantage". One of the processes which knowledge management aims at is knowledge sharing. Tuan (2012), Sandhu, Jain and Ahmad (2011) identified knowledge sharing as a process within the information exchange between the employee in a company serve as a transfer of it. Creativity is also an important issue in the increasingly competitive economic competition. A good idea that can make a positive difference can be of great importance to businesses that are under increasing pressure to survive, but this requires an inspiring, motivating, supportive environment where company employees can develop their knowledge and profit from a new idea business can be gained. Incorporate everyday life, the elements of the environment include, among other things, infrastructure elements, existing economic processes, workers and managers who support and manage them.

This is the reason behind the research of Javed, Rawwas, Khandai, Shahid and Tayyeb, which focuses on trust. They examined small textile firms in Pakistan and concluded: "ethical leadership promotes creativity at a workplace, while trust in leader mediates the effect of ethical leadership on creativity" (Javed, Rawwas, Kandai, Shahid, Tayyeb, 2018). Pucétaité has analyzed the relationship between organizational innovativeness and ethical leadership on the basis of organizational trust with an empirical examination in Lithuania and recognized the statistically significant relationship between the ethical climate in the organizations and the organizational creativity or innovativeness.

### 3. CONCLUSION

The most important goal of the financial world according to the neoclassical studies is to gain economic benefits and profit. Based on the above, companies can achieve these benefits through the building and maintaining trust. Rabbiosi (2010) finds in a scientific study that trust serves as a basis for employee innovativeness, it has an impact on commitment and loyalty, according to Harvey (2011), and Dirks and Ferris (2002) find it has a strong connection with organization performance. Hence, there is a strong correlation among trust, creativity and leadership style what serve as a basis to the employee motivation, commitment and better business performance of the company. Nowadays, the acquisition, maintenance and expansion of knowledge are one of the most important competitiveness factors for companies. Due to the explosive technological, first of all the information technology development, companies have all technical possibilities that can help in the growing competition in the business world, only human capital, knowledge and behavior can hinder or allow the development. The chosen literature shows a clear, positive correlation between the presence of trust, the performance of companies, the motivation and commitment of employees. Therefore, building and maintaining trust is crucially important for a company according to the summarized views and findings above. The higher level of this research field can be the visibility and measurability of this impact. The research hasn't found yet an easy and quick way to measure trust, all studies find empirical data analysis and evaluation of surveys and questionnaires as a useful solution, but these research tools include a lot of subjectivity what can modify the results of the examination. We prefer the case study research methods and the data collection in empirical way to our analysis. According to our opinion, these methods support with the help of the concrete example the better presenting of the economic impact of the lack of trust or atmosphere of trust in an organization.

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## CONTEMPORARY UNDERSTANDING OF SUSTAINABLE DEVELOPMENT AND NEW TRENDS OF NEW URBANISM

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### ABSTRACT

*Nowadays, sustainable development of cities is understood as development in the spirit of an urban trend called New Urbanism. New Urbanism is now the most important international planning movement and is about raising our quality of life and standard of living by creating better places to live. One of the basic principles on which this trend in urbanism is based is the principle of sustainable development. The principle of sustainable development is recognized today as the fundamental principle of the development of the world and for many years finds its expression primarily in documents adopted at the forum of the United Nations (UN). The role and significance of cities as essential human centres remains also recognized and unchallenged for the implementation of sustainable development policy. This study presents the current interpretation of the concept of sustainable development, including sustainable urban development in particular, adopted by the UN in 2015 and its correlation with the new trends emerging in New Urbanism. The result of interdisciplinary dogmatism and literature researches is an indication of whether and how New Urbanism influenced the current understanding of sustainable (cities) development at the level of international regulation and policy, on the other hand how contemporary sustainable development policy can further influence the formation of New Urbanism movement in urban planning and financing. The study raises such important issues for contemporary urban development as participation and social justice through housing and transport design and construction, environmental protection and climate policy, heritage and cultural tradition. In the conclusions, the authors point to deficiencies in the interaction between sustainable development policy and New Urbanism and the need to set new priorities in the development of modern cities at the level of international regulations and policy.*

**Keywords:** *international policy and regulation, New Urbanism, sustainable development, United Nations*

### 1. INTRODUCTION

The principle of sustainable development and the dominant movement in urban planning referred to as New Urbanism are connected not only by the common date of creation - the beginning of the 90s of the twentieth century but also by the common evolution of the trends that dominate in practice. The article examines the interrelationships between sustainable development, in particular urban sustainable development, and New Urbanism. The article refers to the New Urbanism not only in its practical approach (dominating trends) but also the theoretical one expressed in the New Urbanism Charter adopted in 1993. The New Urbanism Charter is a document presenting a comprehensive vision of the development of cities that goes far into the future of urban planning. The principle of sustainable development is examined mainly in its current interpretation. This interpretation was concentrated around the human individual. In accordance with the contemporary interpretation of sustainable development, through the human individual and its development, as well as through the participation of the



human individual in the ongoing processes, the goals that currently are set in sustainable development, in particular in urban sustainable development, can be realized. The principle of sustainable development, though criticized by naturalistic trends in law, has been presented in this study as the only appropriate and for which there is no alternative. The study seeks to answer the question of whether and how New Urbanism, in its theoretical approach and emerging trends in practice, affected the current understanding of sustainable development (urban sustainable development) at the level of international regulations, and how the policy of sustainable development in its evolution affected the formation of this movement in urban practice and for the further development of cities. The research methods used in the article include literature studies and dogmatic studies of documents and legal acts adopted at the international level, mainly at the UN level. The research also leads the authors to formulate conclusions with regard to these trends, both in the practice of sustainable development and New Urbanism, which should be emphasized in the coming years.

## **2. THE RESULTS OF INTERDISCIPLINARY LEGAL AND URBAN RESEARCH**

1. Changes that over the last thirty years have taken place in the way of interpreting sustainable development have allowed thinking about urban planning and development from the point of view of not only environmental protection, but mainly of social needs. Equalizing development opportunities, eliminating poverty - currently dominating values in the principle of sustainable development - allowed thinking about cities as places friendly to people, including the most vulnerable social groups like children, the elderly, people with disabilities. Changes in the way of interpreting the principle of sustainable development have allowed to see the need to design, build or revitalize cities that are combined with the liquidation of social segregation and the protection of cultural heritage (revitalization of historical city centers). Changes in the way of interpreting sustainable development also allowed a broader view of city management through joint decision-making (social participation). Social participation in cities has become a tool for achieving the goals of sustainable development also in other important areas such as climate policy, air quality, and waste management. Environmental protection in cities has thus become the participation of all residents, and not just the fight of environmentalists.
2. New Urbanism appeared as an urban movement that opposes the current principles in spatial planning and meets the need to protect the natural environment. The New Urbanism Charter was adopted in 1993 and thus one year after the UN Conference on Environment and Development during which political assumptions for sustainable development were adopted. Despite the prevailing ecological trend in the policy of sustainable development, the New Urbanism Charter presented a comprehensive and logically constructed vision of designing and further development of regions, cities, districts (human settlements) as a whole. Although the ecological trend prevailing in New Urbanism at the time overshadowed such values as liquidation of social segregation or protection of cultural heritage, the New Urbanism Charter itself emphasized these values as much as the need to protect the natural environment. The studies carried out prove that the comprehensive vision of development of regions, cities, districts (human settlements) adopted in the New Urbanism Charter is currently found in the Agenda 2030 adopted by the UN in 2015, and in particular in the 11th goal of sustainable development which was dedicated to cities. It can therefore be concluded that the New Urbanism Charter played a significant role in the creation of a new interpretation of the principle of sustainable development at the level of regions, cities and human settlements. The New Urbanism Charter, therefore, has not lost its importance. On the contrary, the changes that have taken place in the way of interpreting the principle of

sustainable development allow to finally see and appreciate the potential of the New Urbanism Charter that has existed from the very beginning.

The new trends that currently dominate in practice in New Urbanism remain in close correlation with the current interpretation of the principle of sustainable development and are concentrated around the human individual. It is through the human individual that other goals in sustainable development (urban sustainable development) are to be realized.

### **3. DISCUSSION**

#### **3.1. Sustainable development - evolution and contemporary interpretation and the priorities of urban policy**

Sustainable development as the basic principle in the contemporary development of the world has undergone a profound evolution in the last 30 years. Sustainable development has evolved (Wilkinson and Cary, 2002; Robinson, 2004) from a principle that emphasized the importance of protecting the natural environment (Dovers, 1997) into a principle emphasizing the basic role of the human individual in the development of the modern world. The need to equalize development opportunities at various levels (development of individuals, gender, cities, villages, countries, regions) and elimination of poverty that in the 1990s existed in the further development plan, eventually became the basic values of sustainable development around which others were focused, including protection of the natural environment through so-called green economy or the development of modern cities. It seems that the reasons for the evolution of the principle of sustainable development can be sought in the problems that were created by the protests of ecological organizations. The slowdown in economic development resulting from these protests was not compatible with the need for this development. Equalization of development opportunities and elimination of poverty in the world were to take place as a result of economic development. Paradoxically, therefore, the protection of the natural environment, detached from the needs of the modern world, could become a kind of an obstacle to the implementation of the principle of sustainable development (Hezri and Nordin Hasan, 2006). The current interpretation of the principle of sustainable development focused on the basic role of the human individual in the development of the world. This interpretation can already be derived from Agenda 21 adopted in 1992 (UN, 1992) but gained importance only in 2000 as a result of the adoption of the United Nations Millennium Declaration, which sets out the Millennium Development Goals with the prospect of their implementation by 2015 (UN, 2000), and currently on the basis of the 2030 Development Agenda adopted in 2015: Transforming Our World (UN, 2015) in which the Millennium Development Goals have been replaced by the Sustainable Development Goals with the prospect of their implementation by 2030. Agenda 2030 defines 17 goals and 169 tasks to be implemented as part of sustainable development. Among the 17 main goals, there were, for example, mentioned in the first places: end poverty in all its forms everywhere, end hunger, achieve food security and improved nutrition and promote sustainable agriculture, ensure healthy lives and promote well being for all at all ages, and then, among others: ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, achieve gender equality and empower all women and girls, ensure access to affordable, reliable, sustainable and modern energy for all, promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. With regard to cities: make cities and human settlements inclusive, safe, resilient and sustainable. The role of cities in the sustainable development of the modern world is undisputed. It is enough to quote the commonly known facts:

- half of the human population - 3.5 billion people - lives in cities;
- by 2030, almost 60% of the world's population will live in urban areas;
- in the coming decades, developing countries will receive 95% of urban expansion;

- 828 million people live in slums and this number is constantly increasing;
- cities in the world occupy only about 3% of the Earth's area, while they consume 60-80% of energy and produce 75% of carbon dioxide emissions;
- rapid urbanization has an impact on the size of freshwater resources, the amount of sewage, the environment and public health;
- on the other hand, a high level of urbanization brings productivity gains and leads to the development of technological innovation, while reducing the consumption of raw materials and energy (Platforma SDG, Sustainable Development Goals, 2019; United Nations Human Settlements Programme, 2016).

In Agenda 2030, attention is focused not only on distinguishing and appreciating the importance of the city as a separate goal for achieving sustainable development, but also a comprehensive and meticulous delving into the issues of their planning and development. It should be emphasized that this is a significant difference to the Millennium Development Goals set out in 2000, where urban issues were raised only in terms of the need to liquidate slums. Among the challenges facing cities, there are currently: improper city management, overpopulation, lack of funds for basic services, lack of proper housing construction and deteriorating infrastructure. As part of the tasks envisaged for implementation by 2030, which are to meet these challenges, are indicated both those relating to equalization of development opportunities and elimination of social segregation and poverty, with particular emphasis on the needs of the most vulnerable people, and those that concern the need to protect the natural environment. Among the tasks aimed at equalizing development opportunities there may be mentioned: 1. ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums, 2. provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, 3. provide universal access to safe, inclusive and accessible, green and public spaces, 4. support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning. In terms of environmental protection, the following may be distinguished: 1. reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management, 2. substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters. It deserves special attention that in the modern interpretation of sustainable development (urban sustainable development) for the first time at the level of regulation of the UN goals with regard to cities appears the need for social participation in integrated and sustainable planning and management of human settlements in all countries. The issue of social participation, although widely known in the literature on the subject (Campbell and Jovchelovitch, 2000; Kemp, Loorbach and Rotmans, 2007)), also underlined in EU documents devoted to sustainable development of cities (Eltges, 2009), has been currently included in the subject of urban sustainable development at the international level. This is a huge success of the very idea of social participation. The need to strengthen efforts to protect and safeguard the world's cultural and natural heritage should also be addressed with great attention. Separation of this task in connection with the need to increase the level of inclusion and ensure sustainable urbanization directs attention to other issues commonly known in literature (Skalski 2004; Tylman, 2017), and also already appreciated in the EU urban policy (Toledo Informal Ministerial Meeting on Urban Development, 2010) - the issue of revitalization, and in particular the revitalization of historical city centers. Contemporary interpretation of sustainable development (urban sustainable development) also refers to the need to minimize the effects of natural disasters, especially from the most sensitive groups, by supporting least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings

utilizing local materials. To sum up, therefore, sustainable development (urban sustainable development) in its current interpretation has been focused on the human individual. Thanks to the involvement of the human individual, further planning and development of the urban space will take place, including the protection of the natural environment.

### **3.2. Contemporary urban policy - New Urbanism - current assumptions and prevailing trends**

The New Urbanism remains in close correlation with the principle of sustainable development. The New Urbanism recognizes the principle of sustainable development as one of its basic principles. New Urbanism is the dominating contemporary urban movement in the development of cities which was created as a response to modernism, proposing a return to the traditional composition of urban space and prioritization of a pedestrian over car traffic (Talen, 2006). In practice, trends dominating in New Urbanism have evolved, along with the evolution of the principle of sustainable development, from trends emphasizing the role and importance of environmental protection in cities to trends focusing on the human individual and its needs. Currently, when speaking of New Urbanism, it is emphasized that it is not only about the way of communication, but about people and the comfort of using space (Stangel, 2013). We find the manifestation of New Urbanism in the New Urbanism Charter signed by the founders of the movement in 1993 during the New Urbanism Congress in Chicago (New Urbanism Congress, 1993). It should be emphasized that the New Urbanism Charter was adopted one year after the UN Declaration on Environment and Development. It is not a surprise that New Urbanism was initially dominated by a trend focused on the protection of the natural environment. It should be emphasized that despite the environmental trend prevailing in practice, individual chapters of the Charter are a guideline for authorities, investors and planners for all activities in urbanized space. The New Urbanism Charter comprehensively covers the problems of planning and development of regions, cities and human settlements. The new Urbanism, in terms of the New Urbanism Charter, opposed, inter alia, multiband arteries crossing historic districts, the principle of separating functions of human settlements, mass escape to the suburbs, progressive social segregation, degradation of historical city centers as a result of the outflow of residents. The document defined three scales of urbanization activities: 1. The Region: Metropolis, City, and Town; 2. The Neighborhood, The District, and The Corridor; 3. The Block, The Street, and The Building. In the context of the current interpretation of the principle of sustainable development, it is worth revising the provisions of the New Urbanism Charter. It turns out that after 30 years, in its theoretical, comprehensive approach to urban policy, it remains extremely current, and what is more, it has been reflected in the policy of sustainable development at the UN level. The trend related to the need to protect the natural environment has been reflected primarily in relation to the metropolis, which was recognized as the basic unit of economic development and the basic planning unit. „Metropolitan regions are finite places with geographic boundaries derived from topography, watersheds, coastlines, farmlands, regional parks, and river basins. The metropolis is made of multiple centres that are cities, towns, and villages, each with its own identifiable centre and edges”. New urban planners emphasize that „Farmland and nature are as important to the metropolis as the garden is to the house”. It is at the metropolitan level that environmental aspects become crucial, in particular in terms of land management and, above all, the strategy of infill development of the metropolis. „Infill development within existing urban areas conserves environmental resources, economic investment, and social fabric, while reclaiming marginal and abandoned areas. Metropolitan regions should develop strategies to encourage such infill development over peripheral expansion”. Proper functional development must be accompanied by the development of an ecological transport network aimed in particular at pedestrian, public transport, as well as cycling, not car traffic (Cysek-Pawlak, 2019).

The Charter also includes a guideline for creating a cohesive urban organism where actions are taken to prevent social segregation, revitalization and social participation. The city's development should take into account the historical context of the place. „Cities and towns should bring into proximity a broad spectrum of public and private uses to support a regional economy that benefits people of all incomes”. „The neighbourhoods, the district, and the corridor are the essential elements of development and redevelopment in the metropolis. They form identifiable areas that encourage citizens to take responsibility for their maintenance and evolution”. In particular in districts, the offer of flats should meet the needs of residents with different incomes. The aim is to avoid enclaves of poverty and provide availability of a place of residence next to the workplace. Districts should be compact, pedestrian-friendly, with mixed functions (Duany and Plater-Zyberk, 1994). It is important to avoid shaping mono-functional sleeping districts that determine the need for distant mobility. “Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the elderly and the young”. All this is for neighborhoods to be adapted to the human scale. As indicated above, this goal is to be achieved by taking care of such properties as compact, mixed-use, and pedestrian friendly. The assumption of the availability of many functions within a walking distance is a nod to older people, the disabled or young people who do not move by car. “Transit corridors, when properly planned and coordinated, can help organize metropolitan structure and revitalize urban centers. In contrast, highway corridors should not displace investment from existing centers”. That is why the New Urbanists emphasize the importance of planning documents that define the shape of space in a predictable way. A key role is also played by various green spaces, constituting a kind of connection between particular district or different neighborhoods. Referring to the scale of the Block, the Street, and the Building planning, the New Urbanists emphasize in the first sentences of the Charter that "design is the physical definition of streets and public spaces". The document emphasizes the adjustment of the components of the urban composition to the existing context. In the Urban Planning Charter, we also note the need to link elements of architecture and urban planning with local conditions: building practice, history and local climate or topography. In the end, the key assumption is to be a sense of security. Of particular importance are public spaces: squares and street and public buildings as places strengthening "community identity and the culture of democracy". As summarized in the last sentence of the Charter of Urbanism "Preservation and renewal of historic buildings, districts, and landscapes affirm the continuity and evolution of urban society". As the above analysis proves, the New Urbanism Charter contains a vision of the comprehensive and harmonious development of regions, cities and human settlements. The quality of life of the human person is a superior value and the natural environment should serve to improve this quality and therefore be subject to special protection. In this sense, the New Urbanism Charter remains consistent with the current interpretation of the principle of sustainable development. It should also be noted that in the current spatial planning practice in New Urbanism, the revitalization and protection and promotion of cultural heritage as well as design and construction that meet the need to protect the natural environment, including the need to prevent climate change, have gained importance. These new trends of New Urbanism are also in line with the current interpretation of sustainable development.

#### **4. CONSLUSION**

The principle of sustainable development (urban sustainable development) in the evolution of its interpretation derives from the vision expressed in the Charter of New Urbanism. The assumptions of the New Urbanism Charter can be found in the provisions of Agenda 2030 from 2015 concerning cities. Strong trends of New Urbanism expressed directly or indirectly in the Agenda 2030, which we currently find in the practice of design and development of modern

cities, include revitalization of the city, prevention of urban sprawl, development of social urban movements, inclusion of citizens in decision-making processes through the development of social participation, development of environmental awareness, including the need to protect the climate and air quality, withdrawal from consumerism and much more. These trends should be further reflected in the financing of urban policy. In the opinion of the authors, the trend focused on the protection of cultural heritage, including the revitalization of historical city centers, seems particularly important. This trend will allow not only to preserve the achievements of civilization for future generations, but also to prevent the processes of urban sprawl outside. It also allows, by building historical and cultural consciousness, broad social participation as well as financial participation in the ongoing processes. Social trends that currently dominate both in the policy of sustainable development and in New Urbanism meet with the same kind of criticism. The critics of New Urbanism emphasize that this is a form of social engineering in the leftist spirit. Construction of cities according to certain norms is in contradiction with the freedom of residents. This ideology consists of orders and prohibitions, for example, preventing the construction of houses in the suburbs or driving a car in the center (Ellis, 2002; Smith, 2002). In turn, the criticism of sustainable development focuses on capitalist globalism, lack of standards and measures for sustainable development, lack of information and education on a global scale, lack of recourse to actions incompatible with the principle of sustainable development and many other (Sklair, 2000). Criticism does not however contain a universally accepted alternative.

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## EVALUATING THE RISK PROFILE OF CROATIAN BANKS USING CLUSTER ANALYSIS

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### **ABSTRACT**

*Credit institutions play a major role in the economy, especially in bank-centric systems such as the Croatian financial system, having a significant impact on the stability and efficiency. This paper analyzes how the homogeneity of Croatian banks changed relative to indicators of their profitability, risk exposure and costs. The main objective of this study is to recognize banks that have a comparable risk profile and that have experienced similar problems in the observed years. Three years that were selected represent the pre-crisis, crisis and post-crisis periods. The pre-crisis period refers to the year 2006, which was a period of economic expansion with strong growth of loans, deposits and foreign sources of funding. Then follows the year 2011, which represents the global financial crisis, while the last period is 2016, a year after the Swiss franc became stronger than the euro and caused problems for thousands of people, but also the Croatian banks. A method of multivariate analysis – cluster analysis is applied for all of the Croatian banks operating in 2006, 2011 and 2016. Cluster analysis can be used as an alternative to regression analysis, or more advanced methods in which the relationship between endogenous and exogenous is predetermined. It allows greater freedom without imposing any a priori limitations. The formed clusters give a different insight into the relationship between variables and between the banks than would give other econometric methods. The estimates have especially helped in singling out the banks that were the most vulnerable in the two crises.*  
**Keywords:** *Banking System, Cluster Analysis, Republic of Croatia, Risks, Similarity Assessment*

### **1. INTRODUCTION**

Banks make important financial institutions which, by approving loans and receiving deposits, affect the stability of the entire economic system. Considering that most everyday activities are closely related to banks, such as drawing salaries, paying bills and building up savings, security and profitability of their business is in the interest of the general public. Banks use different business strategies at different stages of the business cycle, so in the expansion phase they operate with the purpose seizing the moment and meeting the growing loan demand, while in the recession the focus is placed on appropriate capitalization that will allow them to cope with various shocks. Since the Croatian independence, banks have gone through various phases of the cycle, similar to many other transition countries. In this sense, the banking crises also occur in the Republic of Croatia, and in the last twenty years the Croatian banking system has gone through four major crisis periods. An important impact on the development of the banking system was the stabilization program at the end of 1993 and the rehabilitation of some banks in 1995 and 1996. After 1997, new weaknesses of the Croatian banking system were observed, and in early autumn 1998, the first signs of the recession of the Croatian economy appeared. All the years of accumulated weaknesses in banks, whose substantial expansion did not follow the proper business policy, came to the fore. There is a growing division of banks into troubled banks and banks without any problems. During 1998, there was talk of a banking crisis and the danger of distorting public confidence in the Croatian banking system.



Managing these crises was certainly a very demanding task for public institutions. The third crisis period in the Croatian banking system occurred in the second half of 2008 as a result of the global crisis. Although the banking system in the Republic of Croatia was considered to be extremely stable, the bad economic situation has led to problems with banks. Influence on banks is evident in lowering credit activity and basic bank income and increasing the cost of loss provisions and the negative effects of exchange rate differences. The last crisis period is related to 2015 and the Swiss franc crisis, which has hit the banking sector much worse than the big economic crisis. The Croatian banking sector has a very bank-centric feature, consequently banks business affects the entire economy. A large share of the banking sector's assets in the country are foreign owned and the top five banks in Croatia make up more than 70% of the total assets of the sector. By the end of 2018, the first five banks accounted for 80.3% of total assets, confirming that the Croatian banking sector is highly concentrated and that large banks are increasing in terms of total assets year after year. This study aims to identify the similarity of banks through the basic indicators of the operations according to the years marked by the pre-crisis, crisis and post-crisis period. Using a cluster analysis technique, the structure of Croatian banking groups that share similar characteristics of risk, profitability and cost exposure is examined. Categorization of banks into small, medium and large banks includes the following: small banks criterion is met if its assets are less than 1% of the assets of the banking sector. The medium banks criterion is met if its assets are greater than 1% and less than 5% of the assets of the banking sector, so if the assets of the bank are greater than or equal to 5% of the banking sector, it belongs to category of large banks. The paper is organized as follows. After the Introduction in Section 1, Section 2 gives an overview of the Croatian banking system and what happened in the observed period. Section 3 starts by explaining data and methods used and, in the end, presents results of the cluster analysis. Section 4 concludes the situation in the Croatian banking sector and results obtained in the analysis. The last section contains appendices referring to the list of banks in the observed periods and the cluster analysis results.

## **2. A BRIEF OVERVIEW OF THE CROATIAN BANKING SECTOR**

The total number of banks at the end of 2006 included 6 large banks, 4 medium banks and 23 small banks. At the end of 2011, there were 6 large banks, 3 medium banks and 22 small banks operating in Croatia and finally, for the last year of our observation, 2006, the number of banks included 6 large banks, 3 medium banks and 16 small banks. It is evident that the number of small banks is decreasing, as small banks cannot cope with increasingly demanding business conditions, the costs of technological advances increase which leads to the problem of market survival and the ownership structure of small banks is constantly changing. Total assets of banks amounted to 304.6 billion kuna at the end of 2006, in 2011 it was 407.0 billion kuna. The increase in banks assets in 2011 was largely based on the assets of foreign majority owners of banks and to a lesser extent the deposits of the population and the slight growth of banks capital. Large banks increased their ever-leading share while the market share of small banks decreased, so current assets of the five largest banks was 76% which is more in comparison with 2006 where it was 72,6%. At the end of 2016 total assets of banks were 388.7 billion kuna so for the fifth year in a row assets of the banking sector continued to decline slightly and current assets of the five largest banks was 75,2%. The increase in assets in 2006 compared to the previous period contributed to the increase in received deposits and to the increase in capital which had the most significant change in bank liabilities. The share of increase in deposits received relates mostly to term deposits, the largest part of which is on household deposits. In the case of medium-sized banks, the biggest increase in assets was felt in 2006. Small banks continued to rely on deposits and capital in financing business while large banks were relying on outstanding loans. Several regulations were amended in the area of credit regulation in the course of 2006. The main reason was the need to quantify and monitor currency-induced credit risk.

There have also been changes to laws and by-laws related to harmonization with the EU, the upgrading of monetary policy and alignment with changes in the area of international accounting standards and international financial reporting standards. The financial crisis in the Republic of Croatia was caused by flooding or domino effect from the environment. Faced with rising borrowing costs, economic activity begins to decline in middle 2008 and by the end of the year, the trend of falling has strengthened, and in early 2009 the period of great recession began. Despite the fact that the Croatian National Bank has contributed to the stability of the banking system through its control measures, the negative consequences of the recession in the real sector could not be avoided. The impact of the crisis on banks has been recorded in the reduction of credit activity and basic bank income, as well as the increase in the cost of provisions for losses and the negative effects of exchange rate differences. Also, the profit period and the profitability of the business was reduced. Looking at return on assets (ROA) and return on equity (ROE) it can be concluded that the banks were affected by the crisis, despite the perception of the public that banks are immune to the crisis. According to Croatian National Bank data, the share of bad loans in the Croatian economy has started to pick up after 2008. In September 2010, the share of bad loans exceeded 10%, and in 2013 it exceeded 15% of total loans. Out of a total of 288.33 billion kuna loans at the end of September 2013, bad loans amounted to 15.32%, or 44.17 billion kuna. This is the highest level of bad loans recorded in that period. The largest share of bad loans was registered with the companies.

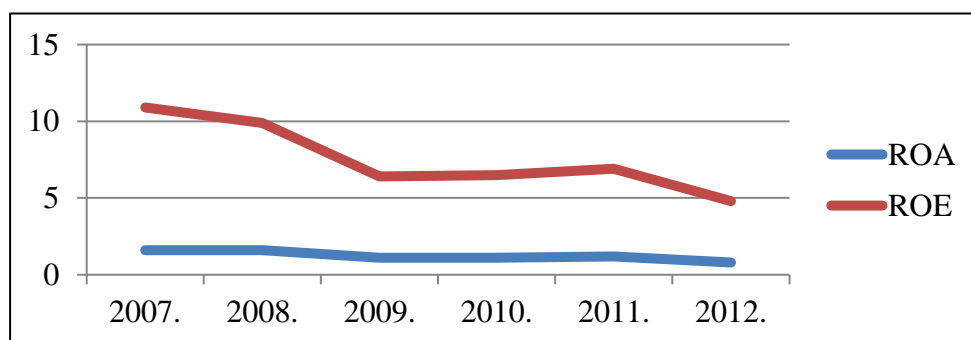


Figure 1: ROA and ROE of banks in Croatia in the period 2007-2012 (Croatian National Bank, Banks Bulletin No. 26)

The main source of growth of banks' assets was an increase in deposits, primarily foreign owners, which, despite the decrease in loans received, had an impact on the slight growth of banks' funding sources. To a lesser extent, property growth was affected by the increase in the capital of banks, mainly on the basis of the gains realized in the current year. The bank's capital is used to increase the amount of available loans to entrepreneurs and citizens. After ROA and ROE growth in the period from 2009 to 2011, in 2012, the profitability of the banking sector continued to decline. ROA fell by 0.4 percentage points and ROE by 2.1 percentage points. The drop in profitability in 2012 is closely related to the movement of interest rate differentials. There was a decrease in the dependence on foreign financing. At the lowest level were also indicators of banks' profitability but despite all this, the banking sector as a whole is still well capitalized and able to handle significant shocks, although differences in the stability of individual banks continue to grow. Looking at the aggregate balance of banks, it can be seen that property in the period after the crisis was reduced nominally by 1.8%, as a result of decreases in loans issued and reduced foreign liabilities of banks (Croatian National Bank, 2017). The growth of domestic securities portfolio has somewhat alleviate the contraction of assets, mild growth tendencies have been noted, but not a stronger growth of banks' balance sheets or changes in their structure. With the onset of the crisis, banks adapted the business model in the segments of credit selection, portfolio optimization, and cost management to

maximize their earnings, but prospects for earning dynamics in the short run remained weak. The increase in institutional clients' share of the credit portfolio of banks after the crisis has restricted the possibility of related sales and the growth of non-interest income. At the same time, the inflow of new bad loans at the beginning of 2013 suggests further pressure on interest income. The room for more substantial operating cost savings is relatively narrow given that they provide the necessary infrastructure and distribution network. Despite the gradual reduction in interest expense, the pressure on interest income is too high to bring net interest income to recovery without new credit growth. Lack of credit growth puts an increasing emphasis on the quality of the existing credit portfolio, which worsens with its aging, under unfavorable macro-circumvention. There is a reduction in the practice of business cooperation between creditors and debtors. Banks' resistance to potential shocks is largely based on the high level of accumulated capital in the foreseeable period. There was no more substantial recapitalization in the form of inflows of funds from the owners in the system, and capital adequacy growth in the observed period was primarily conditioned by investing in less risky assets and capital growth on the basis of retained earnings (Croatian National Bank, 2013).

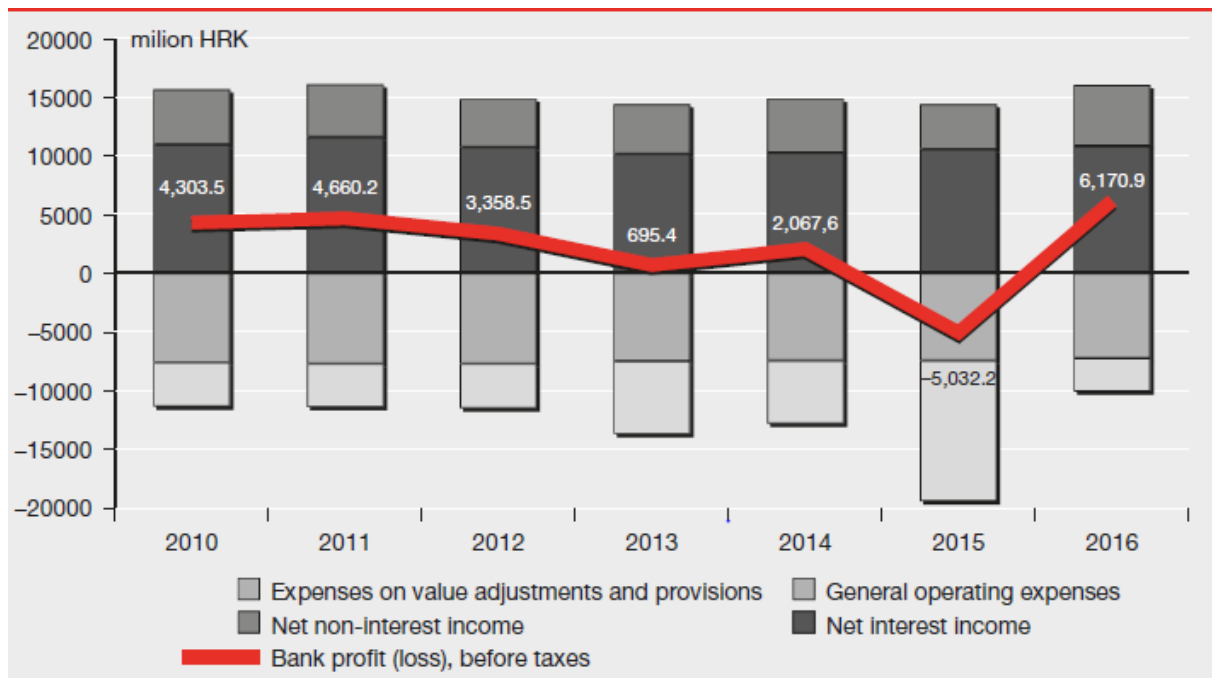


Figure 2: Profit (Loss) of Banks before Tax 2010 – 2016 in Million Kuna (Croatian National Bank, Banks Bulletin No. 30)

The most significant event in the reported period is the outstanding losses in 2015 caused by the conversion of loans in Swiss francs to euro loans, given the fact that the Swiss National Bank's decision additionally affected debtors in CHF in the Republic of Croatia. As a result, the Swiss Franc's value increased immediately, causing a significant increase to monthly payment for debtors in Swiss Franc. The Croatian government, in order to protect citizens, adopted the loan conversion program of Swiss Franc loans to Euros in September 2015. According to the credit institutions' performance indicators, the Swiss franc's conversion to the euro, which began in late 2015 and continued during 2016, has contributed to improving the quality of housing loans to households. To protect citizens from major fluctuations in monthly payments, such as those that occurred in 2015, Croatian National Bank advocates using fixed interest loans. After the losses in 2015, caused by conversion of Swiss franc loans into euro loans, bank earnings in 2016 recovered.

In particular, the effect of lower cost of value adjustments and provisions, in particular the cost of loan conversion provisions, and also the cost of loan adjustments, was greatly affected, partly by the impact of the conversion. In 2016, banks accounted for 6.2 billion kuna (before taxes), and in 2015, due to the loan conversion regulations in September of that year, a loss of more than EUR 5 billion kuna was recorded. The biggest impact on this change was the movement of provisions and value adjustments, respectively their reduction of 12 billion kuna in 2015 to 2.9 billion kuna in 2016. This item in 2015 was burdened by the cost of loan conversion provisions. In 2016, following the majority of credit conversion, these effects were left out or sharply reduced. Moreover, revenues from the abolished housing allowance costs (Croatian National Bank, 2017) have been realized under the influence of a partial write off of converted loans and the improvement of client creditworthiness, as well as early repayments and refinancing. Exit from the crisis is followed by improving the quality of loan structure, reducing partially recoverable and completely unenforceable bank loans, better cost efficiency of banks, but unfortunately to the banks, still weak credit activity which is why they receive non-interest income. It is also important to mention the reduction of exposure of banks to all types of risks and the slow strengthening of regulatory capital. One of the most significant risks in the Croatian banking system, currency-induced credit risk, is reduced due to the aversion of citizens to foreign currency loans and a strong reduction in the foreign currency component of the loan. By the end of 2016, this risk was exposed significantly lower total bank loans (net) than at the end of 2015 (65.5% vs. 71.4%). The trend continued after 2011, at the end of which the share of loans exposed to currency-induced credit risk reached the highest value (77.3%). At the end of 2016, 83.7% of total loans denominated in foreign currencies or in kuna with a currency clause were issued to such borrowers. (Croatian National Bank, 2017). Looking at the basic indicators in Croatia, it could be said that the Swiss franc crisis has hit some banks more strongly in some segments than the previous financial crisis since it has created resistance to borrowing, changed population borrowing preferences, questioned the use of a currency clause that is a source of security for banks and ultimately helped create even greater currency mismatches of assets and liabilities. In this paper, it will be interesting to study how the characteristics of banks changed according to the observed period: the pre-crisis period with the strong growth of banks, the global financial crisis and the post-crisis period marked by the Swiss franc crisis, which arguably hit the Croatian banking sector more than the world crisis.

### **3. CLUSTER ANALYSIS OF BANKS' RISK PROFILE**

In order to examine the similarity of banks in the Republic of Croatia and their adaptation to the macroeconomic environment and common trends, cluster analysis is applied using nine variables. Croatian banks are examined in three selected years: 2006, 2011 and 2016, when 33, 31 and 25 banks did business, respectively. For the purposes of econometric analysis, data from the audited annual financial results of Croatian banks will be used, which are downloaded from the Register of Publicly Available Annual Financial Statements of the Croatian Financial Agency, as well as from Croatian National Bank's Banks Bulletins No. 14, 24 and 30. Full list of selected bank indicators, their notation and definitions are provided in Table 1.

*Table following on the next page*

*Table 1: Selected Bank Indicators (authors)*

Indicator name	Notation	Indicator description
Capital to assets ratio	CAP	Bank capital to assets is the ratio of bank capital and reserves to total assets, which indicates capitalization.
Cash holdings and marketable securities to total assets	CASH	Cash and cash equivalents to total assets is bank's liquidity ratio.
Customers' deposits to total liabilities	CUST	Customers' deposits as a share of total liabilities indicates financial structure.
Loans to households to total assets	HOUSE	Loans to households as a share of total assets shows bank's asset structure.
Loans to deposits ratio	LD	Loan to deposit ratio is used to assess a bank's liquidity by comparing its total loans to its total deposits.
Profit margin	MARG	Profit margin is a profitability ratio calculated as net profit to total income.
Operating expenses to total assets	OPER	Operating expenses to total assets ratio measures non-interest costs in relation to the size of assets and indicates efficiency.
Return on assets	ROA	Return on assets is the ratio of net profit to total assets and indicates bank's profitability.
Return on equity	ROE	Return on equity is the ratio of net profit to shareholders equity and indicates bank's profitability.

This set of indicators includes information related to the main financial ratios. Variables were selected based on similar research, such as Dardac and Boitano (2009) and Ferstl and Seres (2012). The first step is to analyze basic descriptive statistics of the selected indicators. Then, the hierarchical cluster analysis is conducted. Ward's method has been chosen as clustering criteria and squared Euclidean dissimilarity measure is the corresponding cluster distance measure. Given the number of banks and their expected heterogeneity, only solutions with three to five clusters are considered. The clustering is conducted for each observed year separately, which means three cluster analyses. Table 2 contains main results of descriptive statistics for nine observed bank indicators in year 2006.

*Table 2: Basic Descriptive Statistics Results, n=33 Croatian Banks, Data for 2006 (authors' calculation)*

Indicator	Mean	Standard Deviation	Median	Minimum	Maximum
CAP	0.1371272	0.0683747	0.1215023	0.0707319	0.3301894
CASH	0.0177153	0.0121896	0.0162547	0.0033339	0.0590869
CUST	0.7033394	0.1256673	0.7353092	0.3326289	0.8981846
HOUSE	0.5901423	0.070594	0.6009508	0.3706563	0.708061
LD	0.9000913	0.2564412	0.8153603	0.5040823	1.714543
MARG	0.0977855	0.056975	0.1025662	-0.056535	0.2537381
OPER	0.0371468	0.014199	0.0348365	0.0145825	0.0716392
ROA	0.009963	0.0083311	0.0095408	-0.006765	0.0458267
ROE	0.0762485	0.0541618	0.0710034	-0.095639	0.1610537

Result of statistics descriptive analysis for 33 banks show that average capital to asset ratio in 2006 was 13.71% with median of 12.15% and a standard deviation of 6.83%, which means that the Croatian banks had a relatively high level of capitalization in the period before the financial crisis. Liquidity risk is measured with cash and cash equivalents to total assets and Croatian banks scored between 0.33% and 5.91%, with standard deviation of 1.22%. Customers' deposits in total liabilities show banks' dependence on (foreign) borrowed capital, as well as trends in domestic savings. The structure of bank liabilities is very heterogeneous, as this ratio ranged from 33.26% to 89.82%. For large banks, the average ratio was 69%, middle 70% and small 81%, which means that smaller banks rely more on household deposits. As far as loans to households are concerned, the average ratio was 59%, and they are more prone to taking loans at large, stable banks. Loans to deposits ratio indicates the degree in which internal resources are adequate to cover credit demands, in order to allow the sustainable expansion of the credit activity (Dardac and Boitan, 2009). The average loans to deposits ratio was 90%, but ranged between 50% and even 171% in one of the smallest banks. Furthermore, operating expenses ratio is an indicator of banks' efficiency with 3.71% of total assets, ranging from 1.46% to 7.16%. Profitability indicators include profit margin, ROA and ROE. Average ROA in 2006 was around 1% and average ROE 7.62%. Profit margin averaged at 9.78%, with smallest value of -5.65% in Banka Kovanica d.d. and greatest of 25.37% in Štedbanka d.d. After analyzing descriptive data, banks are clustered in four mutually heterogeneous clusters. Data on classification of banks into clusters, as well as the associated dendrogram are provided in Appendix 2 and Appendix 3. Figure 3 shows profile diagram of clusters in 2006.

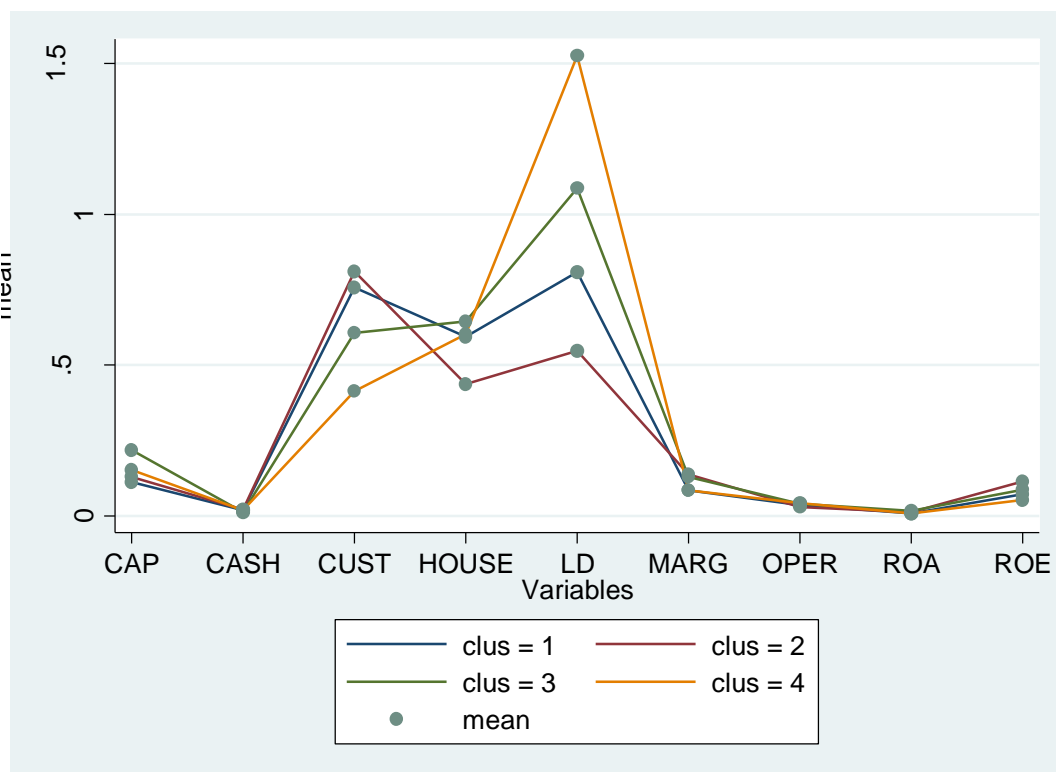


Figure 3: Profile Diagram of Clusters, Average Values, Data for 2006 (authors)

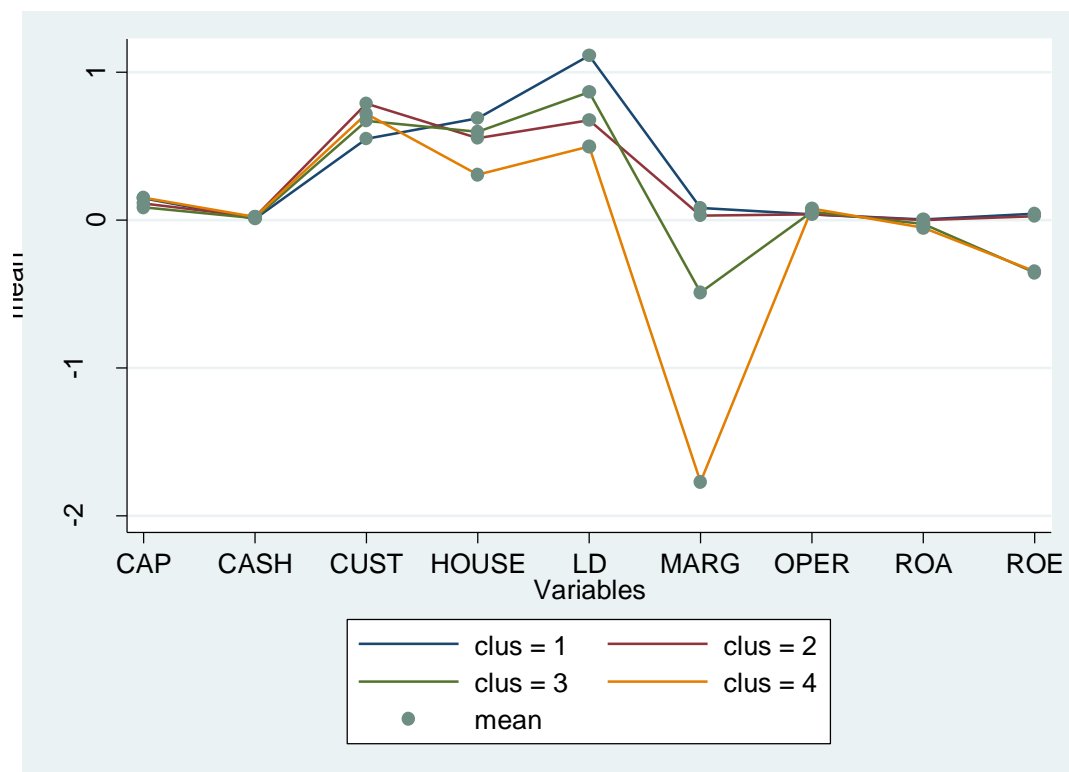
The first cluster makes a less homogeneous group of 21 banks, with the values of the indicators equal to the average for all banks, or just a little smaller. The cluster contains the largest Croatian bank - Zagrebačka banka d.d. with indicators that have similar values to some other large banks such as Erste & Steiermärkische Bank d.d. and Hypo Alpe-Adria-Bank d.d., but also as Credo banka d.d. which occupied only 0.4% of the market; and many other small banks.

The values of the fourth cluster's banks are contrasted the most with averages of all indicators, since they have achieved relatively high profits, relied less on citizen deposits, and have granted loans on the expense of their own borrowing. Table 3 presents descriptive statistics for the period of financial crisis.

*Table 3: Basic Descriptive Statistics Results, n=31 Croatian Banks, Data for 2011 (authors' calculation)*

Indicator	Mean	Standard Deviation	Median	Minimum	Maximum
CAP	0.1240634	0.04347	0.1253705	0.0308969	0.2387957
CASH	0.0164974	0.0096567	0.0143206	0.0030644	0.0522688
CUST	0.6768048	0.1407531	0.7207355	0.3217892	0.870383
HOUSE	0.6075147	0.1117892	0.6491982	0.3079151	0.7535104
LD	0.8715634	0.2733691	0.8706663	0.0786853	1.378537
MARG	-0.090290	0.4042881	0.0300493	-1.768467	0.3521385
OPER	0.0438023	0.0162552	0.0386279	0.0233782	0.0784945
ROA	-0.002090	0.0169542	0.0024992	-0.051820	0.0181655
ROE	-0.041009	0.1839838	0.0132303	-0.584507	0.1438733

In the wake of the financial crisis, banks recorded a lower capital to asset ratio on average, with Štedbanka d.d. having the highest ratio, while Karlovačka banka d.d. and Croatia banka d.d. were much more vulnerable to global financial turmoil, which was reflected in their income loss statements as well. Negative financial results were achieved by six other banks led by Primorska banka d.d. and Nava banka d.d., which is no longer in business, while Primorska banka d.d. is in liquidation since mid-2018. Figure 4 shows which indicators differed between the banks with profit and losses.



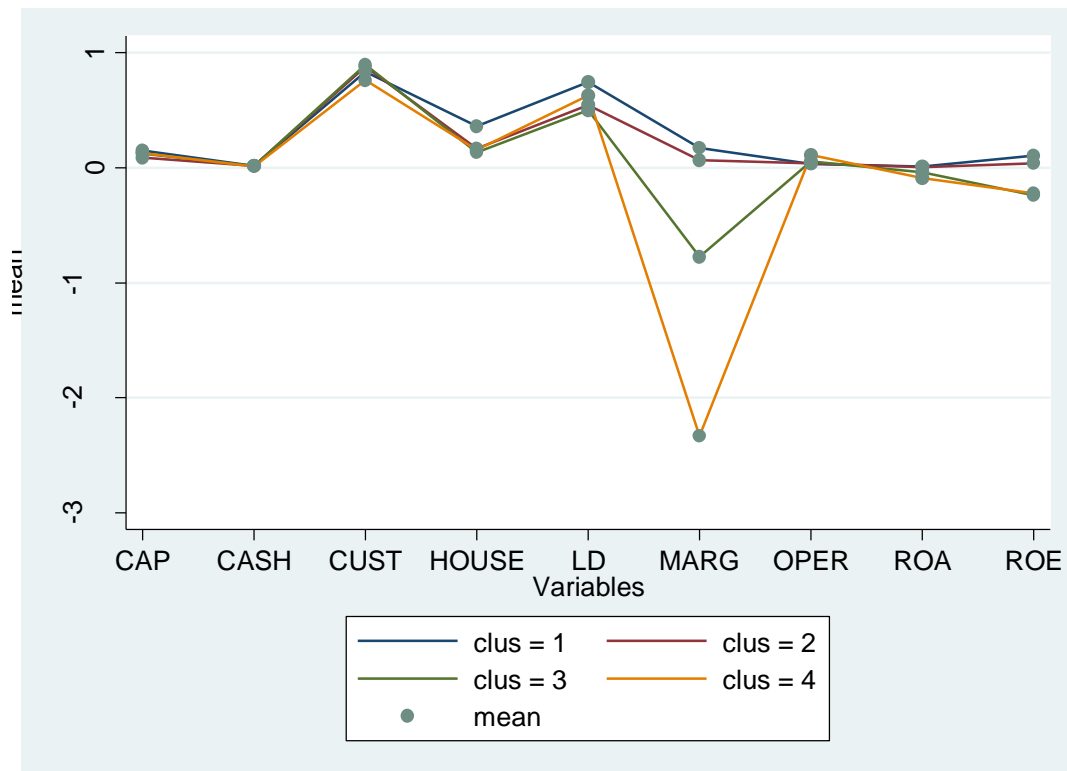
*Figure 4: Profile Diagram of Clusters, Average Values, Data for 2011 (authors)*

Profile diagram for 2011 confirms that banks with better financial results rely more heavily on borrowing than other banks, i.e. have a higher financial leverage, and grant most of the loans to the household sector. Table 4 contains results of descriptive statistics for the last period.

*Table 4: Basic Descriptive Statistics Results, n=25 Croatian Banks, Data for 2016 (authors' calculation)*

Indicator	Mean	Standard Deviation	Median	Minimum	Maximum
CAP	0.1210914	0.0649815	0.1139212	0.0304419	0.3914788
CASH	0.01722	0.010313	0.0156075	0.0039715	0.0594279
CUST	0.8545812	0.0879962	0.8935755	0.6045459	0.9930714
HOUSE	0.2576266	0.1478521	0.2310922	0.057343	0.595294
LD	0.6421137	0.1406224	0.6295782	0.3382724	0.8726883
MARG	-0.043943	0.556389	0.0879115	-2.331497	0.3798718
OPER	0.0415326	0.0226897	0.0332331	0.0238006	0.1114287
ROA	-0.000452	0.0239809	0.0046538	-0.090067	0.0221593
ROE	0.0398157	0.1281419	0.030884	-0.281902	0.2589544

Indicators' values in 2016 were closer to values in 2011 than in 2006, which means that the banks did not return to pre-crisis situation. The reason for this is the Swiss franc crisis which is claimed to have affected the banks more strongly than the world crisis. Average profitability indicators, ROA and profit margin were negative, with ROA almost equal to zero, whereas ROE amounted to 4%, on average, with substantial standard deviation of around 13%. Household loans were drastically reduced to only a quarter of total assets, compared to 61% in 2011. Demand for loans has generally decreased so the loan to deposits ratio was reduced to an average of 64.21%. Figure 5 shows profiles of clusters in 2016.



*Figure 5: Profile Diagram of Clusters, Average Values, Data for 2016 (authors)*



A simple visual inspection and comparison between 2011 and 2016, leads to a conclusion that the banking sector stood better during the financial crisis. In 2016, 6 out of 25 banks recorded loss and in the period 2011-2016, the banking sector lost 6 banks. Big banks operated with less problems, with the exception of Addiko Bank d.d. which at the beginning of 2016 was still Hypo Alpe-Adria-Bank d.d., a bank burdened with mistakes from the past. Just like in 2011, one bank stood out due to an extremely negative result - Veneto banka d.d., therefore the profit margins, and ROA and ROE, were negative. In 2016, the mentioned bank recorded a loss of 134.98 million kuna owing to an increase in the loan repayment delay, which led to an increase in the share of partially recoverable (risk group B) and fully irrecoverable claims, and consequently to an increase in expenses on the basis of impairment losses and provisions for losses on claims. In conclusion, clustering was (more) affected by banks' ability to adapt to the macroeconomic environment rather than by their belonging to peer groups, that is, based on relative size of their assets (or market share).

#### 4. CONCLUSION

This paper examines the similarity of banks in the Republic of Croatia and their adaptation to the macroeconomic environment and common trends. Main aim of the study is to recognize banks that have a comparable risk profile and that have experienced similar problems in the selected years. Three years were chosen to represent the pre-crisis, crisis and post-crisis periods. The pre-crisis period is represented by the year 2006, which was a period of economic expansion with strong demand for loans, deposits and foreign sources of funding. The year 2011 follows, representing the global financial crisis, while the last period refers to the year 2016, one year after the Swiss franc became stronger than the euro and caused problems for thousands of people, but also the Croatian banking sector. In order to examine the homogeneity of Croatian banks, a method of multivariate analysis -cluster analysis - is applied using nine variables. In the selected years, 2006, 2011 and 2016; 33, 31 and 25 banks did business, respectively. Nine chosen variables - capital to assets ratio, cash holdings and marketable securities to total assets, customers' deposits to total liabilities, loans to households to total assets, loans to deposits ratio, profit margin, operating expenses to total assets, return on assets and return on equity - represent indicators of banks' profitability, risk exposure and costs. Data were taken from the Register of Publicly Available Annual Financial Statements of the Croatian Financial Agency, as well as from Croatian National Bank's Banks Bulletins No. 14, 24 and 30. A hierarchical cluster analysis is conducted using Ward's method as clustering criteria and squared Euclidean dissimilarity measure as the corresponding cluster distance measure. Given the number of banks and their expected heterogeneity, only solutions with three to five clusters were considered. The clustering is conducted for each observed year separately, which means three cluster analyses. In all of the three analyses, solutions with four clusters were chosen as optimal. In 2006, four clusters consisted of 21, 3, 6 and 3 banks, respectively. The first cluster makes a less homogeneous group of 21 banks, with the values of the indicators equal to the as well as many small banks. The values of the fourth cluster's banks are contrasted the most with averages of all indicators, since they have achieved relatively high profits, relied less on citizen deposits, and have granted loans on the expense of their own borrowing. The values in the second and third cluster come in between those of the first and fourth cluster. In the wake of the financial crisis, banks recorded a lower capital to asset ratio on average, with small banks proving much more vulnerable to global financial turmoil, which was reflected in their income loss statements as well. Profile diagram confirms that banks with better financial results rely more heavily on borrowing than other banks, i.e. have a higher financial leverage, and grant most of the loans to the household sector. Indicators' values in 2016 were closer to values in 2011 than in 2006, which means that the banks did not return to pre-crisis situation. The reason for this is the Swiss franc crisis which is claimed to have affected the banks more strongly than

the world crisis. Household loans were drastically reduced to only a quarter of total assets, compared to 61% in 2011. Demand for loans has generally decreased so the loan to deposits ratio was reduced to an average of 64.21%. A simple visual inspection and comparison between 2011 and 2016, leads to a conclusion that the banking sector stood better during the financial crisis. Finally, results of the analysis lead to the conclusion that grouping of the banks was more affected by their ability to adapt to the macroeconomic environment rather than by their relative size and market share.

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## APPENDIX

### Appendix 1: List of Banking Institutions in Selected Years, End of Period (Croatian National Bank, Banks Bulletin No. 14, 24, 30)

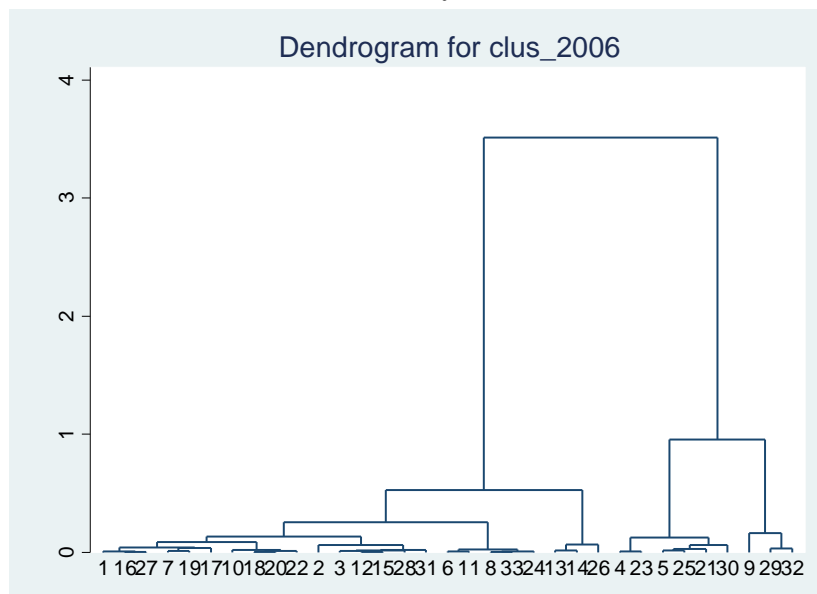
No.	2006	No.	2011	No.	2016
1	Banka Brod d.d., Slavonski Brod	1	Banco Popolare Croatia d.d., Zagreb <sup>3</sup>	1	Addiko Bank d.d., Zagreb <sup>13</sup>
2	Banka Kovanica d.d., Varaždin	2	Banka Brod d.d., Slavonski Brod <sup>4</sup>	2	Banka Kovanica d.d., Varaždin
3	Banka Sonic d.d., Zagreb	3	Banka Kovanica d.d., Varaždin	3	Croatia banka d.d., Zagreb
4	Banka Splitsko-dalmatinska d.d., Split	4	Banka Splitsko-dalmatinska d.d., Split <sup>5</sup>	4	Erste&Steiermärkische Bank d.d., Rijeka
5	Centar banka d.d., Zagreb	5	BKS Bank d.d., Rijeka <sup>6</sup>	5	Hrvatska poštanska banka d.d., Zagreb
6	Credo banka d.d., Split <sup>1</sup>	6	Centar banka d.d., Zagreb <sup>7</sup>	6	Imex banka d.d., Split
7	Croatia banka d.d., Zagreb	7	Croatia banka d.d., Zagreb	7	Istarska kreditna banka Umag d.d., Umag
8	Erste&Steiermärkische Bank d.d., Rijeka	8	Erste&Steiermärkische Bank d.d., Rijeka	8	Jadranska banka d.d., Šibenik
9	Gospodarsko-kreditna banka d.d., Zagreb	9	Hrvatska poštanska banka d.d., Zagreb	9	Karlovačka banka d.d., Karlovac
10	Hrvatska poštanska banka d.d., Zagreb	10	Hypo Alpe-Adria-Bank d.d. Zagreb	10	KentBank d.d., Zagreb
11	Hypo Alpe-Adria-Bank d.d. Zagreb	11	Imex banka d.d., Split	11	Kreditna banka Zagreb d.d., Zagreb
12	Imex banka d.d., Split	12	Istarska kreditna banka Umag d.d., Umag	12	OTP banka Hrvatska d.d., Zadar
13	Istarska kreditna banka Umag d.d., Umag	13	Jadranska banka d.d., Šibenik <sup>8</sup>	13	Partner banka d.d., Zagreb
14	Jadranska banka d.d., Šibenik	14	Karlovačka banka d.d., Karlovac	14	Podravska banka d.d., Koprivnica
15	Karlovačka banka d.d., Karlovac	15	Kreditna banka Zagreb d.d., Zagreb	15	Primorska banka d.d., Rijeka
16	Kreditna banka Zagreb d.d., Zagreb	16	Međimurska banka d.d., Čakovec <sup>9</sup>	16	Privredna banka Zagreb d.d., Zagreb
17	Kvarner banka d.d., Rijeka	17	Nava banka d.d., Zagreb <sup>10</sup>	17	Raiffeisenbank Austria d.d., Zagreb
18	Međimurska banka d.d., Čakovec	18	OTP banka Hrvatska d.d., Zadar	18	Samoborska banka d.d., Samobor
19	Nava banka d.d., Zagreb	19	Partner banka d.d., Zagreb	19	Sberbank d.d., Zagreb
20	OTP banka Hrvatska d.d., Zadar	20	Podravska banka d.d., Koprivnica	20	Slatinska banka d.d., Slatina
21	Partner banka d.d., Zagreb	21	Primorska banka d.d., Rijeka	21	Société Générale-Splitska banka d.d., Split <sup>14</sup>
22	Podravska banka d.d., Koprivnica	22	Privredna banka Zagreb d.d., Zagreb	22	Štedbanka d.d., Zagreb
23	Primorska banka d.d., Rijeka	23	Raiffeisenbank Austria d.d., Zagreb	23	Vaba d.d. banka Varaždin, Varaždin <sup>15</sup>
24	Privredna banka Zagreb d.d., Zagreb	24	Samoborska banka d.d., Samobor	24	Veneto banka d.d., Zagreb
25	Raiffeisenbank Austria d.d., Zagreb	25	Slatinska banka d.d., Slatina	25	Zagrebačka banka d.d., Zagreb
26	Samoborska banka d.d., Samobor	26	Société Générale-Splitska banka d.d., Split		
27	Slatinska banka d.d., Slatina	27	Štedbanka d.d., Zagreb		
28	Slavonska banka d.d., Osijek <sup>2</sup>	28	Vaba d.d. banka Varaždin, Varaždin		
29	Société Générale-Splitska banka d.d., Split	29	Veneto banka d.d., Zagreb <sup>11</sup>		
30	Štedbanka d.d., Zagreb	30	Volksbank d.d., Zagreb <sup>12</sup>		
31	Vaba d.d. banka Varaždin, Varaždin	31	Zagrebačka banka d.d., Zagreb		
32	Volksbank d.d., Zagreb				
33	Zagrebačka banka d.d., Zagreb				

<sup>1</sup> Credo banka d.d., Split, had its authorisation withdrawn on 22 November 2011 and a decision was reached to open compulsory winding-up proceedings. Bankruptcy proceedings were initiated on 16 January 2012. <sup>2</sup> Slavenska banka d.d., Osijek merged with Hypo Alpe-Adria-Bank d.d. Zagreb on 1 March 2009. <sup>3</sup> Banka Sonic d.d., Zagreb changed its name to Banco Popolare Croatia d.d. on 23 April 2007. Banco Popolare Croatia d.d., Zagreb, merged with OTP banka Hrvatska d.d., Zadar, on 1 December 2014. <sup>4</sup> Banka Brod d.d., Slavonski Brod, changed its name to KentBank d.d., Zagreb on 6 July 2012. <sup>5</sup> Bankruptcy proceedings were instituted against Banka splitsko-dalmatinska d.d., Split, on 1 July 2016. <sup>6</sup> Kvarner banka d.d., Rijeka changed its name to BKS Bank d.d., Rijeka on 22 August 2008. BKS Bank d.d., Rijeka, merged with BKS Bank AG, Klagenfurt, on 1 October 2016. At the same time, BKS Bank AG, Glavna podružnica Rijeka, became operational. It changed its name to BKS Bank AG, Glavna podružnica Hrvatska, on 30 June 2017. <sup>7</sup> Bankruptcy proceedings were instituted against Centar banka d.d., Zagreb, on 30 September 2013. <sup>8</sup> Resolution proceedings were instituted against Jadranska banka d.d., Šibenik, on 9 October 2015. <sup>9</sup> Međimurska banka d.d., Čakovec, merged with Privredna banka Zagreb d.d., Zagreb, on 1 December 2012. <sup>10</sup> Bankruptcy proceedings were instituted against Nava banka d.d., Zagreb on 1 December 2014. <sup>11</sup> Gospodarskokreditna banka d.d., Zagreb changed its name to Veneto banka d.d., Zagreb on 6 April 2007. <sup>12</sup> Volksbank d.d., Zagreb, changed its name to Sberbank d.d., Zagreb, on 18 January 2013. <sup>13</sup> Hypo Alpe-Adria-Bank d.d., Zagreb, changed its name to Addiko Bank d.d., Zagreb, on 11 July 2016. <sup>14</sup> Société Générale-Splitska banka d.d., Split, changed its name to Splitska banka d.d., Split on 15 May 2017. <sup>15</sup> Vaba d.d., banka Varaždin, Varaždin, changed its name to J&T banka d.d., Varaždin, on 2 January 2017.

*Appendix 2: Hierarchical Cluster Results, Ward's Clustering Method, Squared Euclidean Distances, n=33 Croatian Banks, Data for 2006 (authors' calculation)*

Cluster	No. of Banks	Indicator	Mean
1	21	CAP	0.1125625
		CASH	0.0182571
		CUST	0.7572061
		HOUSE	0.594538
		LD	0.8080298
		MARG	0.0848546
		OPER	0.0362842
		ROA	0.0079748
		ROE	0.0711961
2	3	CAP	0.1289809
		CASH	0.0221624
		CUST	0.8109587
		HOUSE	0.4376327
		LD	0.5481216
		MARG	0.137803
		OPER	0.0298789
		ROA	0.0124048
		ROE	0.1135494
3	6	CAP	0.2194751
		CASH	0.0125954
		CUST	0.6063226
		HOUSE	0.6445003
		LD	1.086224
		MARG	0.1296057
		OPER	0.0413806
		ROA	0.0854178
		ROE	0.0867781
4	3	CAP	0.1525308
		CASH	0.0197154
		CUST	0.4126863
		HOUSE	0.6031657
		LD	1.524226
		MARG	0.0846441
		OPER	0.0419858
		ROA	0.0080095
		ROE	0.053255

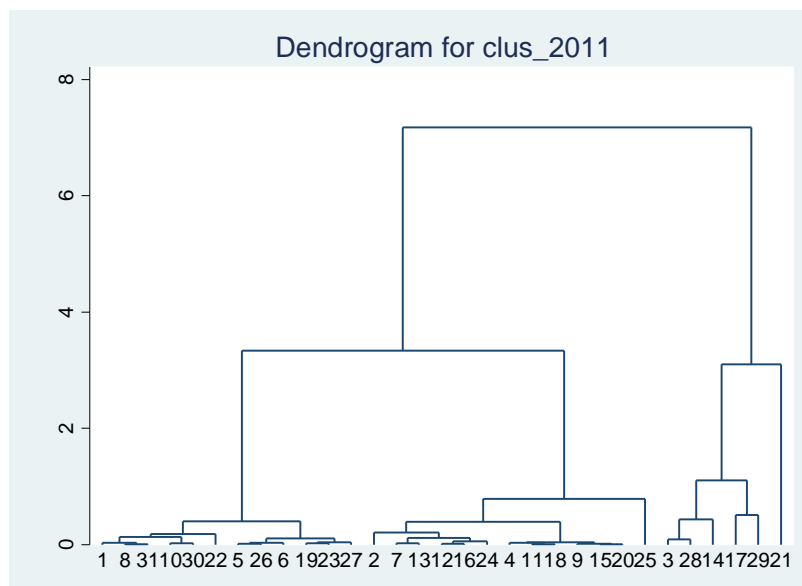
*Appendix 3: Dendrogram, Ward's Clustering Method, Squared Euclidean Distances, n=33 Croatian Banks, Data for 2006 (authors)*



*Appendix 4: Hierarchical Cluster Results, Ward's Clustering Method, Squared Euclidean Distances, n=31 Croatian Banks, Data for 2011 (authors' calculation)*

Cluster	No. of Banks	Indicator	Mean
1	12	CAP	0.1485977
		CASH	0.0107372
		CUST	0.5521975
		HOUSE	0.6911121
		LD	1.112657
		MARG	0.0823247
		OPER	0.0378561
		ROA	0.0066273
		ROE	0.0431843
2	13	CAP	0.11288
		CASH	0.0227599
		CUST	0.7907118
		HOUSE	0.5562354
		LD	0.6787909
		MARG	0.0333784
		OPER	0.0409893
		ROA	0.0030053
		ROE	0.0252823
3	5	CAP	0.0889018
		CASH	0.0130256
		CUST	0.6709182
		HOUSE	0.600127
		LD	0.8683175
		MARG	-0.490465
		OPER	0.0584487
		ROA	-0.026315
		ROE	-0.354929
4	1	CAP	0.1508454
		CASH	0.0215647
		CUST	0.7207355
		HOUSE	0.3079151
		LD	0.5007166
		MARG	-1.768467
		OPER	0.0784945
		ROA	-0.051820
		ROE	-0.343530

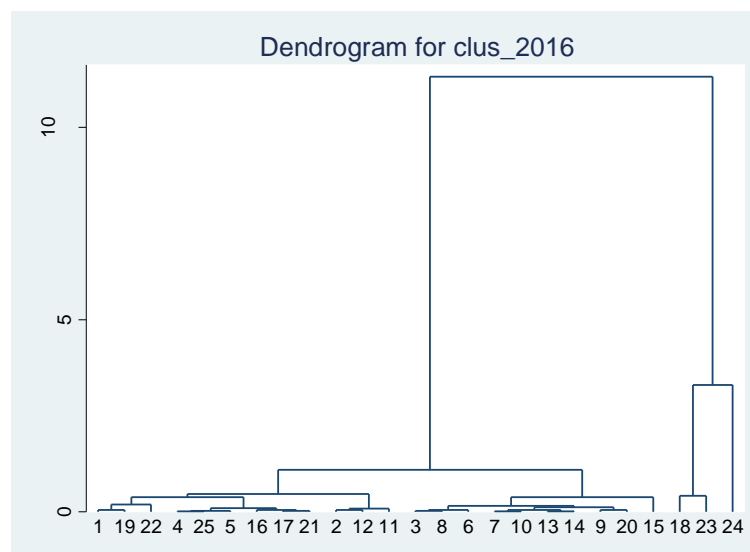
*Appendix 5: Dendrogram, Ward's Clustering Method, Squared Euclidean Distances, n=31 Croatian Banks, Data for 2011 (authors)*



*Appendix 6: Hierarchical Cluster Results, Ward's Clustering Method, Squared Euclidean Distances, n=25 Croatian Banks, Data for 2016 (authors' calculation)*

Cluster	No. of Banks	Indicator	Mean
1	12	CAP	0.1482665
		CASH	0.0168493
		CUST	0.8337217
		HOUSE	0.3610898
		LD	0.7478352
		MARG	0.174357
		OPER	0.0339727
		ROA	0.0096328
		ROE	0.1063139
2	10	CAP	0.0873372
		CASH	0.0176785
		CUST	0.880172
		HOUSE	0.1690836
		LD	0.5449844
		MARG	0.0686987
		OPER	0.040876
		ROA	0.003926
		ROE	0.0413768
3	2	CAP	0.1228362
		CASH	0.0192575
		CUST	0.8975699
		HOUSE	0.1316682
		LD	0.499699
		MARG	-0.773180
		OPER	0.0557313
		ROA	-0.038042
		ROE	-0.236671
4	1	CAP	0.1290423
		CASH	0.0130081
		CUST	0.7630106
		HOUSE	0.1534145
		LD	0.6295782
		MARG	-2.331497
		OPER	0.1104222
		ROA	-0.090067
		ROE	-0.220799

*Appendix 7: Dendrogram, Ward's Clustering Method, Squared Euclidean Distances, n=25 Croatian Banks, Data for 2016 (authors)*



## **FLEXICURITY IN THE CENTRAL EASTERN EUROPE, DECADE AFTER ECONOMIC CRISIS**

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### **ABSTRACT**

*Ability of getting out from the economic crisis of 2008, for many European Union economies was crucial in terms of the next decade. Despite of exceptional global market conditions of years 2016-2018, some EU countries still cannot restore the labor market indicators from before the crisis time, which is a great example of the hysteresis theory in action. Surprisingly, in the same time, some countries in Europe were experiencing a historic heights of their market rates. A significant revival of the Central Eastern Europe countries labor market in 2013-2018, the consistent decline of unemployment, to the level below the EU average, is a successful example of getting out from the economic depression. Accordingly, the unemployment level in many Europe countries is still not at the same level as before the crisis period. Based on the analysis of the job market data of selected EU countries, an attempt was made to explain the reasons for the significant change of job market indicators throughout Europe, following the crisis period. One of the possible explanations of this occurrence, is the degree of using flexicurity methods in given countries, with a special focus placed on flexibility upswing. For example, beside the Polish government restrictive economic policies during the crisis, the Polish workers' ability to comeback to job easily through nonstandard employment, was not less important for the national economy. Although it is worth to not overestimate the job market quality in the Central Europe. The low unemployment rates obscure the lack of systemic and institutional changes for the security of workers. The high level of precarisation in the region, as well as the low activity rates are a real structural challenge for these countries. The high unchecked flexible of labor market, and model of social policy workfare beyond welfare, wreck the abilities of flexicurity model in given countries.*

**Keywords:** *European labor market, Flexicurity model, Labor market economy, Labor market Policy*

### **1. INTRODUCTION**

During the transformation time, all of the Central Eastern Europe (CEE) countries have to cope with the great rise of unemployment. The transition from socialist full employment labor market to free job market in new capitalist systems, had the main cost in the massive loss to employment levels. Local states needed to act fast and radically, as the big picture of transformation plan for millions of citizens was a complete disaster, and the unemployment numbers rose in the CEE region for almost whole of the nineties. This lead to illogical strategies in modern capitalist economies, strategies of massive rollbacks of workforce from labor in form of plans for early retirements and states' encouragement to postpone work with longer periods of education. This passive state labor strategies' tools, used to be a gross part of the CEE countries policy's in the region. Aim of that strategies was to decrease the level of unemployment with a disregard for any possible cost. Consequences of that policies lead to smaller employment levels in the region labor markets, even after the massive unemployment decrease and much bigger demand for workforce in modern CEE emerging economies. Currently, the upswing for employment policies in post transition states is much needed, as the high level of employment is crucial for the nations' economies. Low level of employment in special labor market groups - youth, seniors, disabled people and women's or migrants, was not a problem for the nations with the negative quantity of unemployment.

Post accession period for the CEE countries was time to approach standard of European Employment Strategy (EES) with the Lisbon Strategy as a key part. The demanded employment rose to at least 75% in the Europe 2020 strategy, as it was required to assure keeping the quality standards of jobs in the EU. The flexicurity model with positive security and labor market employability balance was chosen to be a central composition of the Lisbon Strategy.

## **2. CEE REGION LABOR MARKETS' TRANSITION**

Long job market struggle for the transformation countries in Central Eastern Europe (CEE) is well documented and was a great social challenge for the region (Kornai 2006, Kryńska 1998). The status of staying out of the official labor market for millions of the CEE citizens has stopped after many years, with the accession to the European Union, and was well awaited. Before that, the post-socialist nations had to cope with unprecedented unemployment levels during the circa 15 years of economic transition. Because of the new capitalist rules conditions with the old socialist long history transition was a difficult experience for the CEE region. Conversion was a necessary project and an experiment on a massive scale, and has no precedents in the past. To clarify, it was an impossible mission to process the economy transition without any harm to the job market. Despite the short economy dumps for the CEE region, and the great GDP rise during the late nineties and the beginning of the new millennium (Cazes, Nesprova 2003). The high level of unemployment was an unpleasant transition cost for the transformation societies. It was an especially depressing experience for the post-socialist countries, because one of the few success of the socialist systems was the very high level of employment (Boeri 2000). Most of the CEE countries used a strict macroeconomic strategy to fight with hyperinflation (IMF 2014), and the labor market was a victim of that policy. Generally, the states that use a stronger and more strict anti-inflation policy, had better economic performance, but the still high unemployment rise was a problem for all countries, even for the ones with better-managing economies. Poland was the best example of that instance, with one of the best region GDP growth during that period. However, at the same time, it possessed the worst performance of the labor market, with almost 3 millions of people without a job and a double digit level of unemployment (Kryńska 1998). The famous rise of unemployment as an exchange for fighting inflation (the Solow equilibrium model) had a significant effect on the economic transformations in Poland. When the restricted monetary policy was used by the government to tackle hyperinflation, the unemployment rose extraordinarily to almost 20% in the span of 8 years. Despite the scale and the intensity of individual countries' monetary policies, all CEE representatives struggled with the unemployment level. Not only due to the anti-inflation strategies, but mostly because of the inappropriate workers' skills (Lehman 2014) and employers' incapability to generate new vacancies, especially the positions with good quality of work. Furthermore, almost all workers were employed in the national companies before the transition, especially in industry sectors. Modern capitalist labor market has a completely different outlook. The transformation from one job market model to another required a large amount of time (IMF 2014). Another big problem of a transition job market was the big grey sector and the dominance of public sector employment (Lissowska 2017), with too much workers wrongly assigned by official statistics to the agricultural sector and the increase of people's unemployment. In many cases, this generated so-called hidden unemployment, which could lead to an presumption that the job market in the CEE region was in the worst condition during the transition span. The unemployment level of mid-nineties lead to a policy of diminishing the supply of potential workers. These nations were trying to get rid of the active employment status of as many citizens as possible. The program of untimely retirement was a temporary solution of reducing the number of older unemployed workers (Cazes 2003). However, that was really a short term idea, just for bettering the labor statistics. In the same time, more and more people were dragged out from the job market using the small pensions



plan, which lead to future structural problems for the state budget. This process also provided a significant increase in the level of dangerous unofficial work, as young retirees need to work to avoid risk of being poor. These circumstances defined a starting position of the CEE countries in the moment of accession to the European Union structure, and caused an a lot of challenges for the new members and also for the EU labor institutions. The dynamic spread of the flexicurity labor model in the EU, successfully implemented in Denmark and in Netherland, created standards of flexible and adjustable economic safety employment in the Europe community. For the new member states candidates, the EU labor market standards were a great goal. Only few of the quality and safety work principles were quickly absorbed, while at the same time the unemployment indicators improved fast. The other rules, cornerstones of the EES unemployment, are still being strongly challenged, due to the low wages in the region, small productivity and high precarisation diminishing the effectiveness and fairness of the CEE labor market.

### **3. MODERN LABOR MARKET CHANGE IN THE CENTRAL EASTERN EUROPE**

There are two critical factors that formed the modern Central Eastern Europe labor market outlook - the rise of precarious work and the accession of these countries to the EU. The occurrence of both is often thought to be connected by many people expressing doubts in the labor market economy theory in the past few years. The CEE Accession to the European Union structure has reduced the unemployment level in the region on an enormous scale (Table 1, Eurostat), and at the same time extended the precarious work level in the CEE (Karolak, Mrozowicki 2017). All transitioning nations possessed the same problem, which was connected with migration; the problem often observed in emerging countries. The increasing possibilities of migration lead to a whirlpool of migrant human resources. During the high unemployment period, governments encouraged emigration as a temporary resolution for the unwanted, jobless citizens. For example, in Poland almost 2 million people left the country in the span of the 3 following years after the opening of the EU borders (Eurostat). This situation evoked a strong negative backlash called the brain drain phenomenon (Koser 2007). This short-term gain for the government unemployment statistic lead in the next few years to the loss of many talented and qualified citizens. For the individuals and recipient states, this process was mostly a successful experience, as the low supply of jobs in the CEE countries was faced in many developed countries with gratefulness, as their labor markets experienced the lack of the demand for low-qualified jobs (Leschke 2014). The CEE region with this enormous change in the supply of the workers, experienced a downgrade of the unemployment indicators during the 14 years after the accession to EU, even by two or three times. At the same time, many countries of the EU, especially in the south, have experienced a rise of unemployment after 2008 in an unprecedented tempo as we can see in the Table 1. During this period, the precarisation, the low-income jobs, and the non-standard forms of employment also occurred much more often. The correlation between these factors its not clear and obvious, as the massive precarisation trend occurred in all of Europe after the economic crisis of 2009, especially in the south (Mariano, Bernaciak, Mrozowicki, Puligano 2007). At the same time, the non-standard employment levels rose in the most of the EU labor markets, which did not help these countries in getting out of the high unemployment caused by the 2009 crisis. The flexibilization of the CEE region labor markets is presented on table 2 in the 4th chapter, illustrating how the given CEE countries changed in terms of the EPL factor - the change that massively influenced the southern countries of Europe. The influence of many differing economic theories was clearly visible during the period that followed the economic crisis. With the big rise in unemployment, the nations' GDPs fallen sharply, in accordance with the Okun's Law. The hysteresis thesis effects were seen as well, as the GDPs rose after the crisis period which did not translate to the employment levels rising in the same rate even now, 10 years after the crisis.

*Table 1: Chosen indicators of the labor market in the EU countries for multiple given years<sup>1</sup> of 2000-2018 as % of the population/employment<sup>4</sup>. Grouped by the welfare states regimes, (OECD; Eurostat)*

Regimes	Countries	Unemployment/Employment				Low-income rate <sup>2</sup>		Temporary work/Part-time work				Short unemployment (<1M)/ Long unemployment(>1Y) <sup>4</sup>			
		2008		2018		2006	2015	2000		2016		2008		2017	
Post-transition (CEE)	Czechia	4.4	66.6	2.9	74.9	5.0	5.8	9.3	10.2	3.0	4.7	6.7	50.2	10.4	36.0
	Slovakia	9.6	62.3	8.1	67.8	5.3	8.3	4.8	10.1	1.9	6.4	7.5	66.0	8.9	58.8
	Hungary	7.9	56.4	<b>4.2<sup>3</sup></b>	<b>69.2</b>	6.7	<b>10.0</b>	7.1	9.7	3.0	<b>3.7</b>	4.8	48.5	12.2	41.8
	Poland	7.2	59.2	<b>4.9</b>	<b>67.7</b>	10.8	<b>11.0</b>	<b>11.7</b>	<b>9.8</b>	<b>27.5</b>	<b>5.3</b>	15.3	29.0	16.1	31.0
Corporatist/continental	Germany	7.6	70.2	<b>3.7</b>	76.0	8.7	9.5	12.7	17.9	13.1	22.4	6.8	52.5	11.7	<b>41.9</b>
	France	7.1	64.9	9.0	65.6	7.4	8.3	15.4	14.7	16.2	14.3	5.3	37.4	5.0	44.0
Anglo-Saxon Liberal	UK	5.3	72.7	4.3	74.5	10.4	10.0	7.0	23.2	6.0	23.1	16.7	24.2	17.6	26.0
	Ireland	6.2	70.3	6.7	68.7	9.4	9.7	6.0	19.1	8.2	23.7	8.6	26.5	8.4	<b>47.0</b>
Social-democratic	Sweden	6.3	74.3	6.3	77.9	7.5	8.5	15.2	14.1	16.7	13.2	32.0	13.3	27.0	<b>18.8</b>
	Norway	2.6	78.1	3.8	75.1	8.6	<b>9.3</b>	9.3	<b>8.7</b>	20.3	<b>19.1</b>	39.1	6.0	22.3	<b>15.6</b>
	Denmark	3.5	77.9	<b>5.0</b>	75.6	5.3	<b>7.0</b>	9.7	15.8	13.6	<b>21.9</b>	34.7	13.5	18.0	<b>22.9</b>
	Netherlands	3.0	75.9	<b>4.8</b>	<b>77.5</b>	6.5	8.3	13.7	32.5	20.8	<b>39.1</b>	6.7	34.4	7.4	40.7
Southern, traditionalist	Spain	11.3	65.4	<b>15.3</b>	63.0	11.3	<b>15.9</b>	32.2	26.1	7.7	15.1	16.0	18.0	8.7	<b>44.5</b>
	Italy	6.8	58.6	<b>11.2</b>	58.6	10.7	<b>13.6</b>	10.1	14.0	13.0	20.0	8.5	45.7	6.0	<b>58.8</b>
EU28/OECD		7.7	70.3	7.6	68.7	<b>9.6</b>	<b>10.6</b>	<b>12.2</b>	<b>12.6</b>	<b>13.2</b>	<b>15.1</b>	11.5	36.7	9.1	45.1

1. Because of the data limitation for given indicators, some measurement were chosen based on statistics from varying years.,
2. Poverty rate after taxes and transfers, Working age population (18-64),
3. The biggest change in the indicators was bolded and underlined,
4. For the accordingly measurement data indicators was bolded; For short/long unemployment, indicators state as % of unemployment people.

The slow process of leaving behind the period of economic depression is visible in the still increasing numbers of unemployment, as well as in the increasing imbalance of the long/short unemployment and the number of people working low-income jobs (table 1). Most of the Labor market quality indicators put in the table 1 show the regimes model as in the classical shapes. The changes during the time after 2008/2009 crisis in the given regimes, did not move any of the countries to any other regime. However, the small in scale but important changes of the labor market models were observed in the table 1 and 2. The order of employment levels between countries is still in line with 2008, with the best employment rates still observed in the Social-democratic and Anglo-Saxon regimes, but with the difference between these and the Corporatist and Post-transition regimes becoming less significant. The post-transformation countries achieved great progress in terms of the employment and unemployment numbers and topped the other EU regimes in these indicator measurements. Despite the quite soft way out of the crisis for the one part of the EU, the negative changes on the labor market are still being observed after almost ten years after the crisis period.

#### 4. CEE LABOR MARKET MODEL SPECIFIC

The drastic change in the labor market indicators seen in the CEE regions, should be confronted with the outburst of the popularity of new work forms. Taking all of them into account, especially in this region, resulted in much less guaranteed security and quality of work (Karolak; ILO 2018). The negative numbers of working poor, increase in long hours of work and the excessive occurrence of low wages is broadly described in the OECD employment outlook and quality job indicators (OECD 2018). Some of the CEE countries that have the negative lead in the most OECD job quality measurements, are the ones that experienced the greatest positive change in their unemployment and employment numbers. For example, both Poland and Slovenia experience a high percentage of precarious employment, while Romania has the highest level of the in-work poverty in the EU as of 2016 - almost 19%.

Poland, Estonia, Hungary and Bulgaria all have the employment values bigger than the EU averages (Eurostat). Poland also has a big problem of labor market radical segmentation, as it holds the highest rate in EU of temporary work with 27.5 percent, which leads to much less job security experienced in these countries (table no. 2). The CEE countries stand in the labor market policy model theory in the same position as in the social policy's models. Many job market model schemes based on the Gasping-Andersen theory situate the transitions states as a separate model dimension, close to the liberal and southern Europe regimes (B.V Maydell 2006). These states have other capabilities to realize labor market policies that depend strictly on economy performance of a country and their social policies (Spicker 2014). Table 2 shows the level of spending on labor market policies, both active and passive. There are still big discrepancies between the CEE countries and the *old* Europe, as active labor market policies spending (ALMP) is still smaller than in the modeled flexicurity countries like Denmark. In the same time, the passive labor market policies (PLMP) spending, measured as percent of GDP, rose in the most of the EU countries. This outcome is based on the policies adopted after the economic crisis, which weakened the flexicurity model ambitions in Europe, and decreased the trend of investment in the more active labor market policies.

*Table 2: Labor market policies in the particular regimes, divided into chosen components and compared with precarious employment,. Data for the period between years 2006 and 2017<sup>a</sup> (OECD; Eurostat)*

Regimes	Countries	Precarious employment <sup>1</sup>		EPL <sup>2</sup>		PLMP/ALMP (as % of the GDP) <sup>3</sup>				Unemployment Benefits recipients <sup>4</sup>	
		2008	2017	2006	2013	2007		2016 <sup>b</sup>		2007	2016
<i>Post-transition (CEE)</i>	Czechia	0.5	0.4	3.31	<b><u>2.92</u></b> <sup>b</sup>	0.19	0.24	0.18	0.36	25.5	19.1
	Hungary	3.8	1.8	2.00	<b><u>1.59</u></b>	0.35	0.34	0.24	<b><u>0.94</u></b>	30.0	40.5
	Poland	4.2	3.9	2.23	2.23	0.51	0.50	0.24	0.45	8.7	8.1
<i>Corporatist/continental</i>	Germany	0.7	0.4	2.68	2.68	1.19	0.85	0.82	0.63	x	x
	France	4.8	5.2	2.47	2.38	1.58	0.92	<b><u>1.98</u></b>	1.01	42.0	37.5
<i>Anglo-Saxon Liberal</i>	UK	0.4	0.4	1.26	1.10	0.15	0.29	x	x	26.1	32.5
<i>Social-democratic</i>	Sweden	4.8	3.5	2.61	2.61	0.70	0.97	0.55	<b><u>1.17</u></b>	21.0	32.7
	Denmark	1.2	1.4	2.13	2.20	1.46	1.27	1.15	<b><u>2.07</u></b>	42.4	46.3
	Netherlands	1.0	1.1	2.88	2.82	1.15	0.99	<b><u>1.68</u></b>	0.72	x	X
<i>Southern, traditionalist</i>	Spain	4.5	4.7	2.36	<b><u>2.05</u></b>	1.42	0.77	<b><u>1.92</u></b>	0.60	27.6	27.0
	Italy	2.3	<b><u>3.5</u></b>	2.76	2.68	0.59	0.44	1.29	0.51	8.4	5.1
OECD/EU28 <sup>d</sup>		2.2	2.3	2.17	2.04	0.65	0.46	0.77	0.54	<b><u>28.9</u></b>	<b><u>29.2</u></b>

1. Precarious employment as percentage of all nation employment,

2. OECD Employment Protection Legislation 0=lowest strictness, 6=highest strictness,

3. PLMP/ALMP (as percentage of the GDP),

4. Unemployment benefits recipients as % of all unemployed,

<sup>a</sup> Because of the data limitation for given indicators, some measurement were based on different years,

<sup>b</sup> Year 2015 for France and Spain;

<sup>c</sup> The biggest changes of indicators were bolded and underlined.

<sup>d</sup> For the bolded indicators is presented OECD countries data

In table 2, examples of indicators were chosen to present a brief change of labor market quality in few of the CEE countries during the 2008-2017, comparing them against other EU member states. The main aim of the this table is to present the change in the flexicurity model based on OECD and Eurostat data. The data visible in table 2 presents the changes in the CEE labor market regimes in regard of the flexibility versus security nexus. Despite the statistical point, the CEE labor market changed, as well as the labor market policies were influenced by the

flexicurity model implementation. Small numbers of unemployment recipients and *status quo* of the low ALMP visible in the GDP factor in the CEE countries, with an exception of Hungary, demonstrate the still far distance from the modeled flexicurity regimes. It's well described in the economy literature that the protection of employees decreased in the post-transition countries, especially in the temporary and part-time workers sector. Sociology analyses, surveys and interviews with the employees, especially the ones working by non-standard employment forms, present a harmful segmentation of the labor market, observed in the southern countries with the same destructive influences on economy and societies (Mrozowicki). This can be well-confronted with the EPL measurement study of Boeri and Ours (2008), as the economists thesis lead to a conclusion that EPL has negative effect on labor market segmentation. Countries with strict legislation like the southern regimes states, have their job markets separated into two segments, with all benefits from highly secured standard employment on one end, and temporary and part time employment with much less security on the other.

## **5. FLEXICURITY MODEL IMPLEMENTATION IN THE CEE REGION**

Highly recognized theoretical model of the flexicurity is strongly connected with the social-democratic nexus of high flexibility and high work security on the labor market. Based on the success of the Dutch and Danish labor markets, after almost 15 years of the first sight of EU directives, is now an inerasable part of the EES. Much better labor market indicators in terms of unemployment and employment compared with the quality measurement lead to a conclusion that this success of the CEE countries job policies was not fully achieved, and as mentioned – there is still much room for improvement. This is a big challenge for the local states, as the EU directives encourage or even obligate the implementation of flexicurity model in every members state, especially with the post-crisis focus on the security part of the labor market, without any losses of the flexibility-adjustability part (S. Bekker 2018). One of the main arguments for the flexicurity role in the EU, is the necessity to adjust welfare states in Europe to the international economy and to the current trends in demography, technology and servitization of labor market (M. Polakowski 2018). Many experts claim that exemplifications of those tendencies already emerge in the European Union's countries with the aging population trend. This impacts labor market as less workers are capable to work full time shifts and prefer working from home or in the part-time mode, as they are getting older. The same trend is applicable to the millennials' new work styles, as they work-life balance culture style impacts many companies work form policies. These include additional possibilities of working from home or making the work time more flexible. The last trend includes all gig jobs, connected with the outburst of self-employment model of work, as the new generation likes the independency from just one and only source of income. Sadly, this process was not fully successful, as forced gig jobs and self-employment occurs more often. Those work forms are described usually as precariat work (ILO 2016). The welfare states need to adapt into already transforming world of work with new labor market policies. Renaming the work definition has led to certainty that every new form of work should have the same level of security connected with the employment status, assuring and extending traditional work security for the non-standard workers. Despite growing worries about precarisation and unsecure flexicurity models spreading (inflexicurity), market labor is reshaping its look into new forms of work and local labor market guidelines that need to be in line with new trends - telework, gig jobs, non-standard work time, and many others. Telecommunication progress and internet-based new work form solutions, impact the labor world in an irreversible way (ILO; A. Hyde 2003). During the development of flexicurity model in the CEE region, it's important to not disturb the nexus of security and flexibility, as the transition countries' have an important chance of modifying their nations' public policies outlooks.

They need to be based on the EU member states' good practices of adaptive and safe job markets with the positive impact of the non-standard forms of work. Main purpose for the flexicurity implementation is to achieve balance between the quality and security of work in the modern flexibility job market without any harm for these two key parts. The flexicurity successful strategy is possible only with the achievement of three inseparable part of the Danish triangle – based on security, flexibility and active labor market policies. Most of the CEE countries have a weaker leg in terms of the flexicurity notion, as most of them struggle with providing secure non-standard jobs without any harm to the quality of employment and to practice successful Active Labor Market Policies (ALMP) in these countries. Furthermore, its alarming that trade union membership fell radically (table 2; Cazes 2018). Another downside of flexibility at the expense of security in such examples as Poland and Czechia shows the hardship of full flexicurity implementation. The countries among the regimes in figure 1 bubbles differ in flexibility and security a little bit, but there are vast differences between one bubble and the other. Particularly, a CEE member state can be closer to the southern regime or to the Anglo-Saxon one, as they also differ between each other. Generally, although CEE states do not achieve the flexicurity model fully just yet, they do implement the flexicurity approach, especially in terms of flexibility.

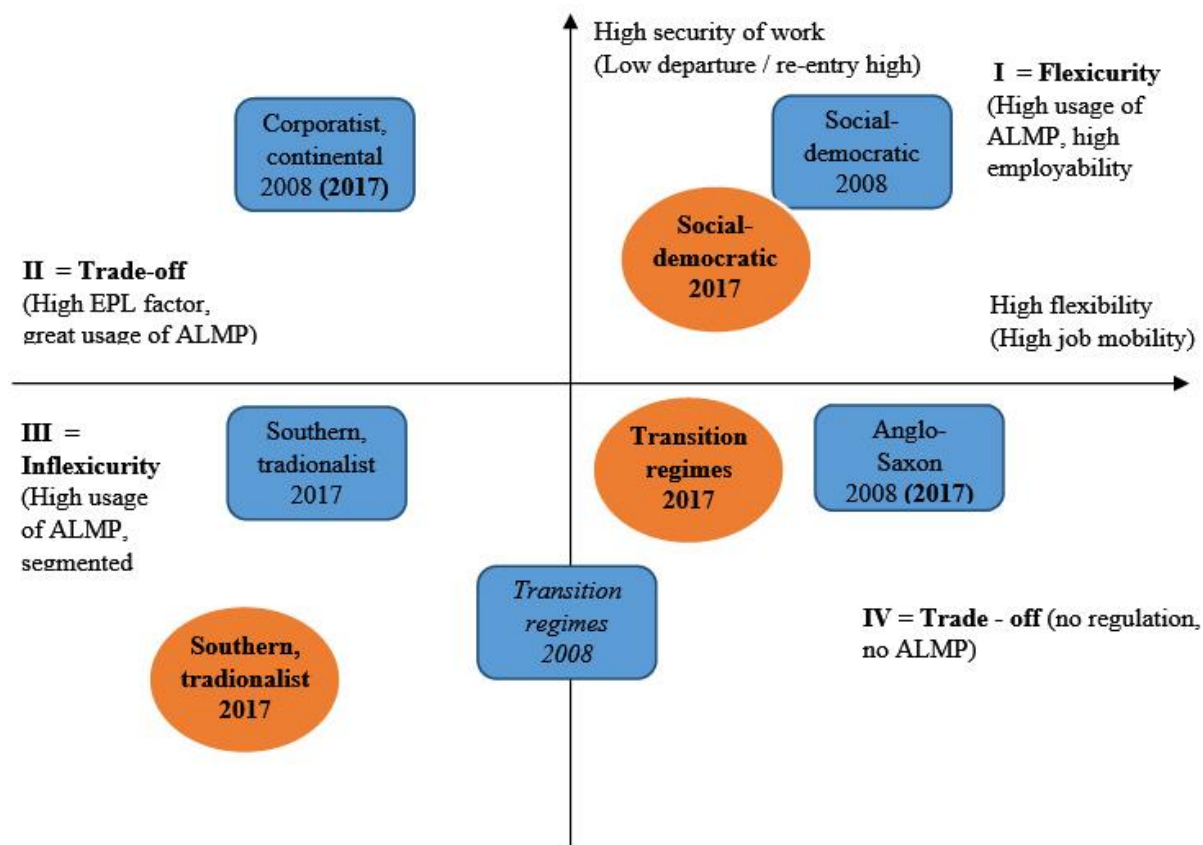


Figure 1: Flexicurity notion in the 2008-2017 span for given Regimes in EU; Figure based on table 1 and 2; model inspired by the work of Maydell (2006)

The CEE countries were not ready in full for the flexicurity model, as they did not based their social policies highly on de-commodification in the free labor market, which resulted in strong segmentation of work (S. Bekker 2016). This worsened the separation between those people with bad quality of work in the transition states, clustered in one segment, when compared with those with all benefits and good security of work in the other. Despite the much higher employment rates in the CEE region, it is still hard to compare the old member state labor

markets with the post-transition ones. Low productivity, high unemployment of youth, low employment of older people and still much smaller wages are all factors not presented in the official, well-known statistics. It is important in the future to look deeper and more closely into the model regime comparisons, as the presentation of the CEE labor model flexicurity implementation isn't yet fully described in the included tables, numbers and facts.

## 6. CONSLUSION

The validation of flexicurity implementation in the CEE countries divided researchers' opinions into two opposing positons. One group criticizes this model as a reason of the rising numbers of precarisation in Europe, while the others defend it as an important part of the CEE region economic improvement, especially in terms of the declining unemployment levels. Both points of view are valid observations, and both of them are interconnected as many of new employees in the CEE economies are recruited for jobs with low quality of work, especially in Poland and Hungary. It is a difficult task to appropriately assess those trends positively or negatively, as visible in the available data collected in tables 1 and 2. Figure 1 presents a small, but significant increase in higher security and flexibility of labor markets of these countries in the 2008-2017 period. On the comparison to the move of the other regimes, post-transition countries labour market has changed visibly positive. Social democratic regimes, moved during this 10 years span to those regimes with the less employment and higher unemployment, and smaller flexibility as well. Closer to the others regimes groups in the figure. Aftermath, of the crisis period adjustment of the social democratic labour market. Same adjustment on the figure was made in terms of the southern regimes, as the great declined in the labour market indicators, lead to a much less security on the labour market. Other two group – Anglo-Saxon and continental didn't moved his position in the analyzed time. Higher level of EPL strictness in the CEE region for the standard forms of work and benefits connected with them in the CEE regions, has validated the status quo of segmentation in the mentioned countries. Tito and Boeri described that a higher level of EPL can lead to a greater level of work uncertainty for the outsiders. Van Vliet and Nijboer's article lead to the same observation, as the flexicurity was proven to guarantee security for the insiders, just as insecurity for the outsiders (2012). Many questions are raised with the flexicurity model so universally spread. For example, the Cazes and Nesprova article points out that with the low cost of unskilled temporary workers in the CEE makes the workers easier to be exploited (ILO 2018). This is backed empirically by the experience of many exploited eastern workers of international companies such as Amazon (Boewe, Schulten 2017). On contrary, the same article provide the data that supports the case for flexicurity effectiveness for the whole EU region and CEE, as it observes a positive correlation of introducing the flexicurity and rises in countries' GDP and productivity, as well as the decrease in poverty.

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## INPUT-OUTPUT APPROACH FOR MEASURING TOTAL ECONOMIC EFFECTS OF PRODUCTIVE SECTORS IN CROATIA

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### ABSTRACT

*The most common approach of quantitative macroeconomic analysis that quantifies direct, indirect and induced effects of certain sectors of interest to the national economy is input-output analysis. In this paper direct, indirect and induced effects of productive sectors to the Croatian economy in terms of output and employment for the year 2010 are quantified. To quantify direct and indirect effects of certain productive sector, open input-output model, where final consumption is considered as an exogenous variable, is used. Induced effects are quantified by using closed input-output model, model where some components of final consumption, mainly households, are considered as an endogenous variables. Based on the input-output approach, output multipliers type I and type II and employment multipliers type I and type II for all Croatian productive sectors are quantified. Productive sectors with the highest output multipliers type I and type II are sectors that have high share of domestic intermediate products, i.e. sectors: Travel agency, tour operator and other reservation services, Other transport equipment and Air transport services. The highest number of employees per 1 million of HRK delivered final goods and services was recorded in sectors: Products of agriculture, hunting and related services, Postal and courier services and Social work services. Productive sector with the lowest number of jobs directly or indirectly related to deliveries of final products worth 1 million HRK was sector Imputed rents of owner-occupied dwellings.*

**Keywords:** *employment multipliers, input-output analysis, output multipliers, productive sectors*

### 1. INTRODUCTION

Input-output (IO) analysis, a practical method of quantitative macroeconomic analysis, has been adopted as a method for analyzing the economic structure of many economies (Jurčić, 2000; Miller and Blair, 2009). The author of the modern IO analysis is Wassily Leontief (1906.-1999.). He made the first IO tables for US economy for the year 1919 and 1929. In 1973, he received the Nobel Prize for Economics for the development of the IO methodology and its contribution to economic analysis. The precondition for IO analysis application is the existence of qualitative statistical-information databases which provide exhaustive and consistent overview of intermediate input deliveries and final products among economic sectors. Those databases are called IO tables. In IO table total economy is broken down into a certain number of productive sectors.



By the Regulation of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union (EU) (European Union, 2013) it is prescribed that IO table for each EU economy should be compiled at least in five years. IO tables are compiled according to the methodology of the European system of national and regional accounts (ESA). From May 2013 the ESA 2010 is valid (Eurostat, 2013). The role of productive sectors in the growth and development of national economy in domestic literature is insufficiently explored. Therefore, the motivation for this paper is analysis direct, indirect and induced effects of Croatian productive sector by using IO methodology. Results of this empirical research will contribute to understanding of the importance of particular productive sectors for Croatian economy. The remainder of this paper is organized as follows. After the introduction, review of the relevant literature of the economic effects of different sectors of Croatian economy is presented. Chapter 3 describes the research methodology and data sources. Chapter 5 presents the empirical results of output multipliers type I and type II and employment multipliers type I and type II for Croatian productive sectors. Finally, in the conclusion, final remarks and recommendations for further research are provided.

## **2. LITERATURE REVIEW**

Review of the relevant literature indicates a limited number of studies concerning the total effects of sector of interest on the growth and development of the Croatian economy by using IO methodology. Based on the IO table for the year 2004 Lovrinčević and Mikulić (2014) analyzed the importance of the Croatian forestry and wood industry on the Croatian economy. Sector Wood and products of wood and cork had the highest output multiplier 1.94, highest gross value added (GVA) multiplier 2.12 and highest employment multiplier 1.77. Buturac, Lovrinčević and Mikulić (2014) analyzed the impact of textile industry on Croatian economy. For sector Textiles the highest output multiplier type I 1.48 was noticed, GVA multiplier 1.50 and employment multiplier 1.4. Buturac and Vizek (2015) measured the overall importance of food industry for the Croatian economy. For food industry output multiplier type II 2.53, GVA multiplier type II 1.13 and employment multiplier type II 2.37 were recorded. Keček, Žajdela Hrustek and Dušak (2016) analyzed the multiplicative effects of the ICT sectors to the Croatian economy by using IO tables for the year 2004 and 2010. In 2004, sector Radio, television and communication equipment and apparatus had the highest output multiplier type I 1.80 and highest GVA multiplier type I 1.88. In 2010, the largest output multiplier type I (1.69) and largest GVA multiplier type I (1.84) belongs to sector Publishing services. In the same paper, for the year 2010, the analysis of output multiplier type I and GVA multiplier type I for ICT sectors was also conducted for the group of new and long-standing EU member countries. Based on the higher values of observed multipliers, authors concluded that ICT sectors were better utilized for economic growth and development in long-standing EU member countries, than in new EU member countries. Mikulić, Keček and Žajdela Hrustek (2017) evaluated overall impact of foreign tourist demand on the Croatian GVA and employment for the period 2010-2014 based on the IO table for the year 2010 and Balance of Payments database updated by the Croatian National Bank and TOMAS survey conducted by the Institute for Tourism. In 2014 expenditures of foreign tourists induced approximately 45 billion HRK or more than 16 % of the Croatian GVA and generated more than 250 thousands of jobs or approximately 17 % jobs in Republic of Croatia. Mikulić, Lovrinčević and Keček (2018) quantified total effects of wind power plant deployment on the Croatian economy. Results of the analysis indicate positive indirect and induced effects related to the deployment of wind power plants in Republic of Croatia. In 2016, 114 million euros of GVA and 481 full-time equivalent jobs were generated by operation of wind power plants in the Croatian economy.

### 3. RESEARCH METHODOLOGY AND DATA SOURCES

Main equations in the IO model:

$$X_i = \sum_{j=1}^n X_{ij} + Y_i = \sum_{j=1}^n a_{ij}X_j + Y_i, i = 1, \dots, n \quad (1)$$

represent flows between  $n$  productive sectors (Miller and Blair, 2009).  $X_i$  is a sector's  $i$  total output,  $X_{ij}$  is output from sector  $i$  which is used as an intermediate input by sector  $j$  and  $Y_i$  is the final demand for products in sector  $i$ . Ratio of a product from sector  $i$  that is required by sector  $j$  in order to produce one unit:

$$a_{ij} = \frac{X_{ij}}{X_j} \quad (2)$$

Is called technical coefficient. The system of main equations in the IO model (1) has the matrix form:

$$X = AX + Y \quad (3)$$

where  $X = \begin{bmatrix} X_1 \\ \vdots \\ X_n \end{bmatrix}$  is column vector of outputs,  $A = \begin{bmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \cdots & a_{nn} \end{bmatrix}$  is a square  $n \times n$  matrix of

technical coefficients and  $Y = \begin{bmatrix} Y_1 \\ \vdots \\ Y_n \end{bmatrix}$  is column vector of final demands. The solution to the system (3) is:

$$X = (I - A)^{-1}Y \quad (4)$$

where  $I$  is an  $n$ -by- $n$  identity matrix. Matrix  $L = (I - A)^{-1}$  is called Leontief inverse matrix, whose elements,  $\alpha_{ij}$ , represent direct and indirect output of sector  $i$  per one unit of final demand in sector  $j$ .

IO analysis is mainly used to quantify direct, indirect and induced economic effects of certain productive sector to the overall national economy (ten Raa, 2005; Miller and Blair, 2009; Mikulić, 2018). Direct and indirect effects of a certain productive sector are quantified by using open IO model. In open IO model final consumption is considered as an exogenous variable. Induced effects are quantified by using closed IO model. In closed IO model some components of final consumption, mainly households, are considered as an endogenous variables. If matrix of technical coefficients  $A$  is expanded with one more row representing compensation of employees coefficients and one more column representing household consumption coefficients, matrix  $\bar{A}$  is obtained. Matrix  $\bar{L} = (I - \bar{A})^{-1} = \begin{bmatrix} \bar{L}_{11} & \bar{L}_{12} \\ \bar{L}_{21} & \bar{L}_{22} \end{bmatrix}$ , a square  $(n + 1) \times (n + 1)$  matrix, allows induced effects calculation. Induced effects are result of household consumption growing, financed by wages earned in sector of interest. This consumption growing induces the growth in production of all sectors involved in the production chain of goods and services intended for final consumption of households. To calculate induced effects for the observed  $n$  sectors, a square  $n \times n$  matrix  $\bar{L}_{11}$  is used (McLennan, 2006; Miller and Blair, 2009). Elements  $\bar{\alpha}_{ij}$  of matrix  $\bar{L}_{11}$  represent direct, indirect and induced effects on the increase in sector's  $i$  production as a result of the unit growth of final demand by the sector  $j$ .

The output multiplier type I for sector  $j$  is defined as:

$$m(o)_j = \sum_{i=1}^n \alpha_{ij}, j = 1, \dots, n \quad (5)$$

The output multiplier type II equals to the sum of the  $j$  column elements of matrix  $\overline{L}_{11}$ :

$$\overline{m}(o)_j = \sum_{i=1}^n \overline{\alpha}_{ij}, j = 1, \dots, n \quad (6)$$

Employment multipliers type I of sector  $j$  is defined as the ratio of total employment increase that includes direct and indirect effects in final consumption and ratio of number of employees and output of sector  $j$ :

$$m(e)_j = \frac{\sum_{i=1}^n \tilde{e}_i \alpha_{ij}}{\tilde{e}_j}, j = 1, \dots, n \quad (7)$$

where coefficients  $\tilde{e}_j = \frac{e_j}{x_j}, j = 1, \dots, n$ , represent the share of the number of employees of sector  $j$  in its output.

Employment multipliers type II of sector  $j$  equals to the ratio of total employment growth in the sector  $j$  which includes direct, indirect and induced effects in the change of final demand and the ratio of the number of employees and output of sector  $j$ :

$$\overline{m}(e)_j = \frac{\sum_{i=1}^n \tilde{e}_i \overline{\alpha}_{ij}}{\tilde{e}_j}, j = 1, \dots, n \quad (8)$$

The main data source used in this research is Croatian IO table for domestic production for the year 2010 (Croatian Bureau of Statistics, 2018). In this IO table the whole Croatian economy is broken down into 64 mutually exclusive productive sectors. Additional data source used in this research is Eurostat database, precisely Eurostat National accounts employment data by industry (nama\_10\_a64\_e) (Eurostat, 2018). From this data source are downloaded data of the number of employees required for employment multipliers type I and type II calculation.

#### 4. RESEARCH RESULTS

This chapter provides results of output and employment multipliers for Croatian productive sectors based on the IO table for the year 2010 and Eurostat National accounts employment data by industry. According to the formulas (5) and (6) output multipliers type I and type II are calculated. Employment multipliers type I and type II are calculated according to the formulas (7) and (8).

*Table 1: Productive sectors with the highest output multipliers type I*

Code	Description	Value
CPA_N79	Travel agency, tour operator and other reservation services and related services	1.94
CPA_C30	Other transport equipment	1.85
CPA_H51	Air transport services	1.82
CPA_M73	Advertising and market research services	1.80
CPA_C10-C12	Food products, beverages and tobacco products	1.77

*Source: Authors' calculation*

*Table 2: Productive sectors with the highest output multipliers type II*

Code	Description	Value
CPA_N79	Travel agency, tour operator and other reservation services and related services	2.72
CPA_T	Services of households as employers	2.66
CPA_C30	Other transport equipment	2.60
CPA_J59-J60	Motion picture, video and television programme production services	2.60
CPA_H51	Air transport services	2.58

*Source: Authors' calculation*

Based on the results shown in Table 1 the highest output multiplier type I was detected for sector code CPA\_N79 - Travel agency, tour operator and other reservation services and related services 1.94. This value suggests that if the final demand for the products of this sector increases by 1 kuna, the total output in the Croatian economy is increased by 1.94 kuna. Other sectors with the highest output multiplier type I in Republic of Croatia are other transport equipment, air transport, advertising and market research, food products, beverages and tobacco. When induced consumption is included, the group of sectors with the highest output multiplier type II is almost identical to the group of sectors with the highest output multiplier type I (Table 2).

*Table 3: Productive sectors with the lowest output multipliers type I*

Code	Description	Value
CPA_L68A	Imputed rents of owner-occupied dwellings	1.08
CPA_K66	Services auxiliary to financial services and insurance services	1.25
CPA_L68B	Real estate services (excluding imputed rent)	1.28
CPA_P85	Education services	1.28
CPA_K64	Financial services, except insurance and pension funding	1.29

*Source: Authors' calculation*

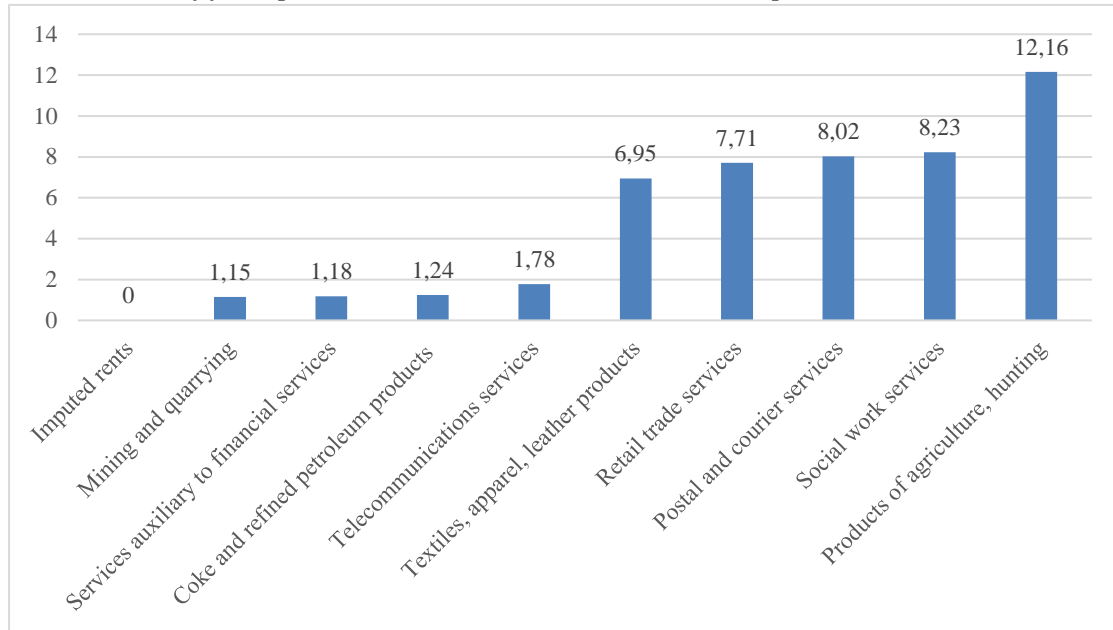
*Table 4: Productive sectors with the lowest output multipliers type II*

Code	Description	Value
CPA_L68A	Imputed rents of owner-occupied dwellings	1.08
CPA_K66	Services auxiliary to financial services and insurance services	1.69
CPA_L68B	Real estate services (excluding imputed rent)	1.72
CPA_K64	Financial services, except insurance and pension funding	1.78
CPA_B	Mining and quarrying	1.80

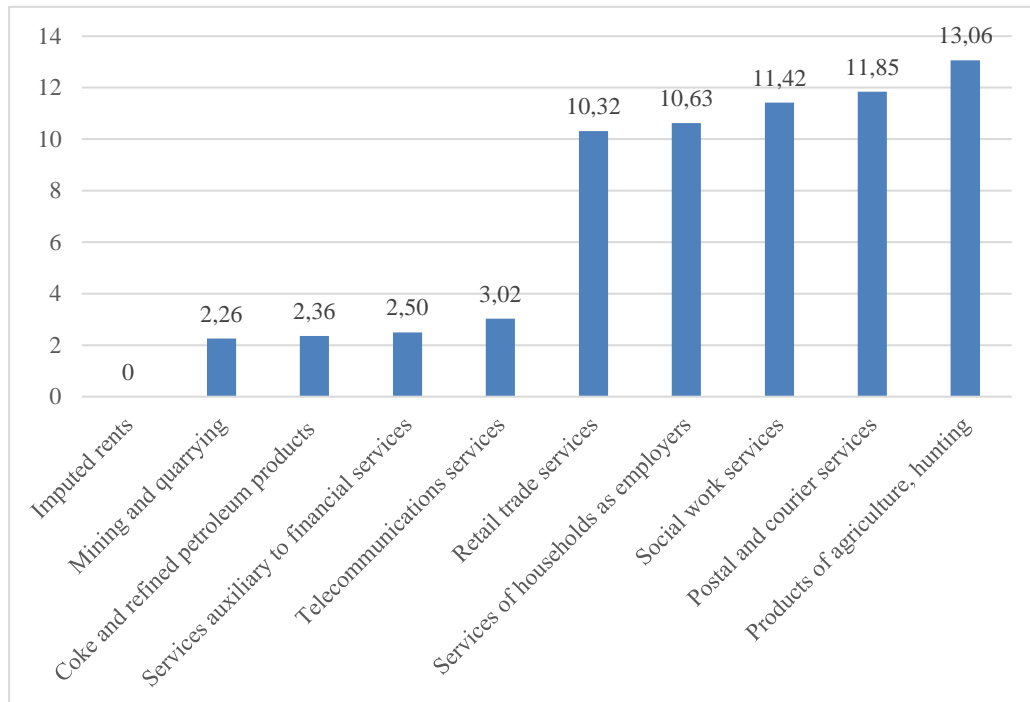
*Source: Authors' calculation*

The lowest output multiplier type I and type II is attributed to the sector code CPA\_L68A - Imputed rents of owner-occupied dwellings, because of the low share of intermediate consumption in that sector. Low effects are also apparent for a whole range of service activities where incorporating induced effects increases multipliers (Table 3 and Table 4). Instead of employment multipliers type I and type II, sectors distribution is graphically presented by the highest and lowest number of jobs directly or indirectly related to deliveries of final products worth 1 million HRK. It can be noticed that 1 million HRK of output of a particular sector directly and indirectly generates up to 12 jobs, in the sector code CPA\_A01 - Products of agriculture, hunting and related services, followed by sector code CPA\_Q87\_Q88 - Social work services and sector code CPA\_H53 - Postal and courier services with 8 jobs (Figure 1). On the other side, the group of sectors that directly and indirectly generates the smallest number of jobs on 1 million HRK of output is very heterogeneous and capture sectors whose production is based on the application of capital input and high technology. It is necessary to allocate sector code CPA\_L68A - Imputed rents of owner-occupied dwellings in which there is no direct employment and has no effect on the production of other sectors.

*Figure 1: Productive sectors with the lowest and highest number of jobs related to deliveries of final products worth 1 million HRK in the open IO model*



When induced effects are induced, 1 million HRK of output of a particular sector directly and indirectly generates the highest number of jobs also in sector code CPA\_A01 - Products of agriculture, hunting and related services (13 employees), followed by sector code CPA\_H53 - Postal and courier services and sector code CPA\_Q87\_Q88 - Social work services (Figure 2). The lowest number of employed person was recorded for sector code CPA\_L68A - Imputed rents of owner-occupied dwellings, where the effect of the induced personal consumption inclusion is negligible.



*Figure 2: Productive sectors with the lowest and highest number of jobs related to deliveries of final products worth 1 million HRK in closed IO model*

## 5. CONSLUSION

IO analysis is the most common approach of quantitative macroeconomic analysis for direct, indirect and induced effects of certain sectors of interest to the national economy quantification. Indicators that determine these effects are called multipliers. Two types of multipliers differ: multipliers type I and multipliers type II, depending on the type of IO model, the open or closed IO model. IO tables allow quantification of total changes that increase production in a sector brings to the overall economy, which are the result of inter-sector dependencies in production processes. Results of multipliers calculation in this paper indicate that sectors with the largest output multiplier type I and type II are sectors with a complex value added chain and a high share of domestic intermediate products. On the other hand, sectors with the lowest output multiplier type I and type II are labor intensive sectors whose production do not require significant inputs from other domestic producers. Furthermore, sectors with the highest number of jobs directly and indirectly related to deliveries of final products worth 1 million HRK are labor intensive sectors with a low level of labor productivity. Sectors with the lowest number of employees on 1 million HRK of delivered final goods and services are sectors whose production is based on the application of capital input and high technology. In the future research it is expected to evaluate direct, indirect and induced effects of Croatian productive sectors for more recent period. Change of production technology under the influence of technical progress over the time leads to a potential change in technical coefficients. Therefore, it would be of great benefit to compare calculations of economic effects based on the IO table for the year 2015 with the results obtained in this paper.

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## THE REDUCTION OF ENVIRONMENTAL POLLUTION IN AFRICA: ICT AND CO2 EMISSIONS

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### ABSTRACT

*The level of CO2 emissions is under constant examination by many scholars. This is because the level of growth of the world population, of the ICT sector and therefore the ever-increasing economic development of the planet contribute significantly to increase CO2 emissions and energy consumption. Despite the fact that technological advances and nations all over the world expect solutions capable of making cities, means of transport, intelligent electrical systems and industrial processes and anti-pollution measures with stringent regulations capable of generating an ever lower environmental impact, the level of global pollution emissions continues to grow. The purpose of this study is examine how the level of CO2 emissions grows with population growth and whether this can be related to the level of industrialization of a country. This will be done taking into account the investments in the ICT sector and other variables implemented in the study. To achieve this goal, after choosing South Africa for the completeness of the information being analyzed, we use a data set containing all the information on the variables analyzed for South Africa and distributed over a period of 42 years. The results of the empirical study confirm the relationship between CO2 emissions and demographic growth, but above all the level of energy use, showing that developing countries over a period of 50 years will have significant increases in pollution.*

**Keywords:** CO2 emissions, ICT, developing economies, developed economies

### 1. INTRODUCTION

Innovation and technological progress are constantly subjects to many scholars analysis. This is because the level of growth in the Information and Communication Technology (ICT) sector contributes significantly to increase the levels of CO2 emissions and energy consumption on the planet (Boden, TA, G. Marland, and RJ Andres 2015). Despite the fact that technological advances and nations all over the world expect solutions capable of making cities, means of transport, intelligent electrical systems and industrial processes and anti-pollution measures with stringent regulations capable of generating an ever lower environmental impact, the level of global pollution emissions continues to grow. In fact, the numerous available literature makes it possible to verify that, in addition to the relationship due to the demographic growth of a country, there is a relationship between the CO2 emissions of some growing nations such as those present in Africa and the energy used. The technological innovation process, besides having a positive impact on the economic and social growth of a country, at the same time produces negative effects (Roula Inglesi-Lotz, Eyup Dogan 2018). These mainly concern the constantly increasing rate of pollution. In spite the measures and commitments made by states with agreements such as the United Nations Framework Convention on Climate Change (UNFCCC), the main international agreement on climate action, to try to reduce pollution levels, the growth of CO2 emissions rates continues to increase with overwhelming effects on



the climate (Boden, TA, G. Marland, and RJ Andres, 2015). To date, global anti-pollution measures have been ratified and carried out by 195 countries. Initially, they represented a means to foster collaborative relations between countries, but today they have become real stringent measures necessary to guarantee the healthiness of the planet for the future. Among the many, we can include the Doha amendment to the Kyoto Protocol, concerning the commitments for the period from 2013 to 2020, and the Paris agreement, a new global agreement on climate change extended to all UNFCCC countries. Over time these have proven to be essential to buffer and reduce the increase of the CO<sub>2</sub> emissions (Wenhui Chen, Yalin Lei 2018). If we analyze the status of literature, highlights the precise analysis of climate influences related to air pollution in Africa and Europe. Specifically, taking as a starting point the year 2013, it can be seen that the European Economic Area (EEA) shows how about 500,000 premature deaths in the African continent, a very alarming fact. In Africa, air pollution causes more premature deaths of chronic problems and much more under the spotlight, such as water contamination and child malnutrition. A phenomenon of remarkable proportions, which could be further magnified and generate an unprecedented health and climate crisis for the continent. These are the data and the result produced by a study conducted by the Organization for Economic Cooperation and Development (OECD) which tried to estimate the economic and social costs generated by the increase in air quality pollution levels. According to a report by the OECD (Roy, R. 2016), the premature deaths caused by air pollution would be 712 thousand each year. Very high figures, as shown by the comparison through data on deaths due to contaminated water (about 550 thousand) and malnutrition (275 thousand). To address the problem, it is estimated that at least \$ 214 billion are required a year. In particular, as specified in the aforementioned report, pollution rate generated by traffic, by the power plants and by the growth of the industrial sector as well as by the combustion of waste is in a strong and continuous increase. The nations that suffer the most from the phenomenon regarding the African continent are Egypt, South Africa, Ethiopia and Nigeria. As can be seen from the results generated by the empirical survey, these are nations with a strong propensity to growth, even if characterized by different forms and levels. If, in the literature, the problem of air quality in Africa has been associated with indoor environments (heat, electric turbines, incinerators, etc.), today to arouse a great deal of concern is the pollution of open spaces. In addition, the mortality caused by the increase in fine particles in Africa grew by 36% between 1900 and 2013 and together have also increased deaths from indoor pollution. In other words, traffic and fumes from industries gallop at double speed. As it is written by 'OECD (Roy, R. 2016), with about 712,000 deaths in the African continent. This estimate, by contrast, is constantly growing: the current level of the death rate is about 1/4 higher than those of the 90's. In order to really understand the real dimension of the data mentioned, the study deaths must be divided by samples. Only a part of the reckless deaths is connected with the high pollution rate in closed areas, from homes that use old-fashioned appliances for the production of electricity, where are also used rudimentary cooking techniques, which during the combustion process damage mainly women and children health conditions. In the literature, if one observes the growth of the environmental impact, it can be noted that regards to open spaces there is a growth of about 36% of mortality, while deaths within the homes are greater than 18% compared to the 90's. The atmosphere of the larger urban centers is heavily polluted because of the high number of means of transport, from the diesel generators used for the numerous blackout outbreaks, from the enterprises and from the combustion of waste. A context that sees a general worsening of the situation with the increase of the population in urban areas more than tripled in the last thirty years. By 2050 estimates predict that in the African continent the population will double in the average number. It is reasonable to think that the risk of a growth in pollution levels will be unequivocal.

Below are analyzed in depth three areas responsible for high and harmful clinical effects with the aim of verifying the relationship between the level of CO<sub>2</sub> emissions and population growth, investment in technology, energy consumption, use of air transport, GDP per capita, level of exports, imports.

## **2. INTRODUCTION**

To cause a strong increase in the level of pollution in this sector, among the first causes we find the use of used and obsolete vehicles coming from Europe and East Asia. As we will see in the empirical analysis carried out later, even if the levels of pollution recorded in the Asian metropolises are not yet reached, it can be seen that in some countries pollution levels have already surpassed the Asian cities. Unfortunately, the monitoring systems currently available in the nations of the African continent are very small, but where there is the possibility of obtaining data, these are significantly worrisome. In a recent OMS ranking, four of the largest cities with the highest level of pollution are Nigerian. The solution, of simple intuition, could be to sanction the import of crumbling and deeply polluting cars and firmly choose new generation electric solutions built taking into account the Smart City models (Dorina Pojani, Dominic Stead 2015).

### **2.1. Electricity generators**

There are still many countries where electricity is almost absent or absent. In fact, the current figure relating to African families that still do not have electricity is about 400 million. By relating the African context to the world context, we see that this represents only 3.5% of the world's electricity. In Africa, large active companies turn out to be a few. The main connection lines are limited and above all concentrated in large urban centers. Furthermore, the cost of electricity is among the highest in the world. This may seem strange considering the resources that Africa has. In order to avoid continuous thefts in homes, the inhabitants are forced to install power generators. To date, in fact, in countries such as Nigeria, approximately twelve million units are estimated with an estimated purchase cost of 10 billion dollars in the period from 2009 to 2012. The energy resources currently available in Nigeria of about 7000 MW are insufficient and therefore similar attitudes by the population in need of electricity are natural. Naturally, the impact that the pollutants emitted have on health starting from the CO and the particulate matter, is significantly important. Inadequate ventilation of homes causes serious consequences and this is due to generators in homes. Therefore, this obsolete system favors a progressive development towards renewable energy sources. Looking at the European context, the rapid drop in prices of alternative sources such as photovoltaics or batteries for the powering of LEDs, will favor in the long run the distribution of innovative solutions to be alternated with diesel or petrol powered generators. Technological progress should in fact start to induce small communities still isolated to create small electricity networks (Wenhui Chen, Yalin Lei 2018).

### **2.2. Food and diseases related to food preparation**

Another area to focus on is the technique of rudimentary cooking using as a cooking system the fire generated by the classic charcoal, leaves, branches, and dried waste products. These practices, used by about seven hundred million Africans. Unfortunately, in twenty-three countries on the continent, about 90% of people do not have a valid and functional alternative. In addition, given the increase in population many Africans will be increasingly forced to use primitive and highly harmful techniques for cooking food to rise to 900 million. The effects of these techniques are quite evident CO, gas and emissions cause serious and irreparable damage to the respiratory and/or pulmonary systems and maternal embryos. According to the OMS each year there are counted about 4.3 million dead people for such reasons. About half are children under the age of 5. Among the main causes we have lung diseases.

A study in which also states that the percentage of subjects exposed to emissions is higher in the female sex. This comes up almost to four times more than men (Megan Sheahan, Christopher B. Barrett 2017).

### **2.3. The effects on the environment**

The effects on the environment are not to be neglected. FAO states from studies that one of six households use 8 kg of wood for cooking. In Sub-Saharan Africa around 300 million tons of wood are used each year with devastating effects on the territory. Desertification and deforestation being disproportionate do not allow the recovery of vegetation. GDP growth in Africa. All these numbers on CO<sub>2</sub> emissions and pollution rates are unequivocally linked to the increase in productivity on the African continent. Recent studies show that, in proportion to its size, the wealth of Africa is remarkable. Naturally, the inability to exploit resources in every sector is the major cause of immigration not only to Europe but also to South Africa (Roula Inglesi-Lotz, Eyup Dogan 2018). 5 of the top ten countries in development for the rate of investments in sustainable economy are African. In the last decades, the GDP of the continent has increased by 30%, and the population of 85% lives in countries that are stable from a socio-economic point of view. In the period between 2012 and 2017, the majority of sub-Saharan Africa has grown by even 6% with peaks in Angola of 6.5%, Ethiopia by 6.3% and in Zambia (6.2%). The main economic indices suggest Africa as a land of investments. By 2030, about half of the population will settle in major urban centers and by 2040 at least six countries will have a per capita GDP that will exceed 10 billion dollars. (Kenneth Creamer, Robert Tregathen Botha 2016).

### **2.4. Pollution and scheduled obsolescence products: A global problem**

In 2017, 229 million TV sets were sold, a figure destined to grow up to 259 over the next 5 years, thanks also to emerging countries. In the last quarter of 2017 alone, 70.6 million PCs and about 2 billion smartphones were sold. Of course one of the main consequences of these data on the increase in consumption of high-tech products is the exponential growth of e-waste. According to UN estimates, every year between 20 and 50 million tons of e-waste are produced, the numbers are destined to grow given the increase in investments in technology that the big giants such as Apple, Samsung, Huawei and many others are forced to do in order to remain competitive in the market. Every technological device sold in the EU includes in the price a "recycling fee", to be used for the regular disposal of the device, once its useful life has been finalized. However, despite this tax is collected annually 5 billion euro, it is estimated that at least 2/3 of the technological waste never reaches a disposal system approved, because it is much cheaper to send it to Africa. To recycle a computer in Germany, in fact, it takes 3.5 euros, while dispose of a monitor in France it takes 5. Sending any equipment in a container in Ghana costs no more than 1.5 euros. One of the problems that feeds this process of pollution is certainly the speed with which products on the market change according to the most innovative technological features and at the same pace of the speed with which a consumer changes smartphone, laptop or TV. In order to understand better, let's analyze the concept of programmed obsolescence. With this we refer to the practice according to which a high-tech product is studied and designed by the producers in order to resist a fixed life time and force the user or customer to replace it with a new one. The main objective of this practice is certainly an increase in business profits. Once a washing machine or a television were fundamental so that the first problem was thought to a solution that could repair and refurbish the tool. Today they begin to give the first problems, working in fits and starts, already in the third year of age in place of the repair, the change is chosen. Unfortunately, as previously stated, to encourage the growth of waste and e-waste, there are many components in the vast majority of cases studied as corporate strategies for increasing profits.

The products on the market currently have a guarantee that does not go beyond two years, spare parts are often untraceable and therefore require the replacement of the asset, the continuous process of technological innovation with the numerous aggressive and persuasive spots in which they are proposed to the average consumer innovative solutions and improvements to the previously purchased product, these are among the main causes of the phenomenon in question. The work allows us to identify, through the consultation of the papers and cited sources (Roula Inglesi-Lotz, Eyup Dogan 2018), the presence of an effective relationship between the level of economic and demographic growth for the African countries and the pollution rate of the same. In Table 1: we find 36 African countries divided by geographical areas.

*Table1: African countries divided by geographical areas*

<i>Sampled countries (2002–2011)</i>				
<i>North</i>	<i>Central</i>	<i>South</i>	<i>West</i>	<i>East</i>
Algeria	Cameron	Angola	Benin	Comoros
Egypt	Gabon	Botswana	Capo Verde	Ethiopia
Libya	Sao Tomé and Principe	Lesotho	Costa d'Avorio	Kenya
Tunisia	Congo	Mozambique	Gambia	Mauritius
Morocco		Namibia	Ghana	Seychelles
		South Africa	Guinea-Bissau	Sudan
		Swaziland	Nigeria	Tanzania
		Zambia	Senegal	
		Zimbabwe	Togo	

South Africa is definitely the leader of CO2 emissions on the African continent (Roula Inglesi-Lotz, Eyup Dogan 2018). Its 499,016 Kilotons are more than twice those of Egypt (216.136 kiloton). Both pale in comparison to the land that destroys the production of China (7.7 million) and the United States (5.3 million). The numbers at first glance may be because the US has the population of Kenya ten times.

*Figure 1: Sahel and West African Club*



So, how are these numbers created when the population is taken into account? Here is a brief breakdown: Kenya 3.2 Kilotons for 10,000 people, Nigeria 4.6 Kilotons for 10,000 people, China 53.6 Kilotons for 10,000 people, South Africa 101.84 Kilotons for 10,000 people, US 173.8 Kilotons for 10,000 people. Recently, the United Nations Organization (UN) has supported the International Panel on Climate Change, and warned how significant are the costs associated with the relentless growth of global carbon emissions and the pollution caused by the lack of stringent measures in the waste disposal sector and how urgent measures are needed to reduce emissions.

### 3. METHODOLOGY: SPEARMAN R NO GAUSSIAN DISTRIBUTION

The aim of this empirical study, through the collection and analysis of information related to the studied phenomenon, consists in the identification of the economical factors which influence the levels of CO<sub>2</sub> emissions in Africa. Specifically, in light of the above, being one of the most polluted states, for the completeness of the data collected and being able to evaluate the variables listed in Table 2 over a period of 42 years, the state of South Africa was chosen. The variables considered to conduct the analysis are the following.

*Table 2: The variables considered to conduct the analysis*

Variables	Definition	Characteristics of the used variables and references
TCO <sub>2</sub>	<b>Total Co<sub>2</sub> emissions expressed in Kt</b>	Dependent variable
POP	<b>Number of the population of the state of South Africa</b>	Independent variable
GDP	<b>GDP-USD</b>	Independent variable
EXP	<b>Export level of goods and services calculated at the value of the US dollar US \$</b>	Independent variable
EPC	<b>Percentage share of total energy consumption from fossil carbon sources</b>	Independent variable
EU	<b>Used energy expressed in oil consumption (Kg) per capita</b>	Independent variable
AT	<b>Number of passengers who used air transport</b>	Independent variable
IG	<b>Import level of goods and services at the current value of the US dollar US \$</b>	Independent variable
ICT	<b>Percentage share of investment on imports of services, BoP, etc</b>	Independent variable

The sample consists of 42 observations for South Africa for the 8 different variables. Data on CO<sub>2</sub> emission index were taken from the data banks of the World Bank and World Resources Institute. The time frame considered was that which goes from 1971 to 2012 in order to have a historical picture on the progress of the variables. With reference to each of the variables there is a brief description of the main statistics

*Table 3: Data on CO<sub>2</sub> emission index*

	TCO <sub>2</sub>	POP	GDP	EXP	EPC	EU	AT	IG	ICT
<b>Min.</b>	168568	23482813	2,03E+13	4,33E+12	2162	1913	1659500	4,74E+12	0,67708333
<b>1st Qu.</b>	263214	30732280	8,23E+13	2,12E+13	3553	2273	3986650	1,75E+13	19.10
<b>Median :</b>	335012	38899040	1,23E+14	3,08E+13	4089	2463	5473200	2,61E+13	0,94027778
<b>Mean</b>	331118	38694483	1,43E+14	3,96E+13	3890	2421	6804378	3,73E+13	22.28
<b>3rd Qu.</b>	384265	46865881	1,55E+14	3,70E+13	4492	2619	8039684	3,45E+13	24.20.00
<b>Max.</b>	503112	52998213	4,17E+14	1,27E+14	4777	2913	17571565	1,24E+14	31.63

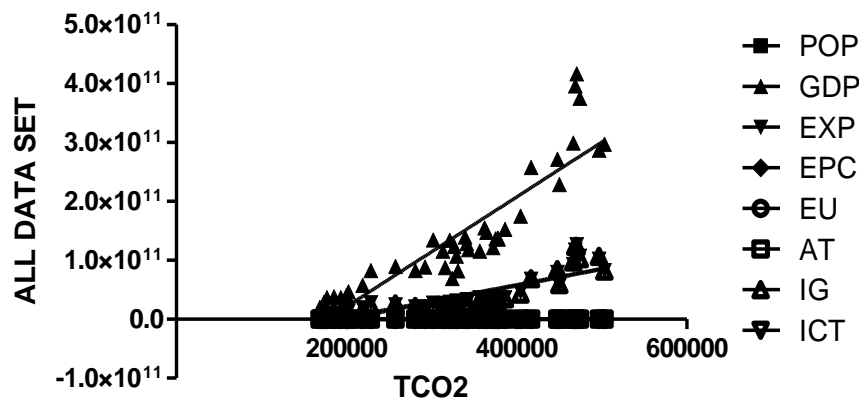
The analysis of correlation was performed via Graph Pad Prism 5.0. putting on y axis the years and on x axis the Co<sub>2</sub> levels emissions. We used this software because we talk about Co<sub>2</sub> emissions that is also correlated with health people (Table 4 and Figure 2).

*Table following on the next page*

Table 4: The analysis of correlation

Number of XY Pairs	42	42	42	42	42	42	42	42
Pearson r	0,9642	0,8911	0,8616	0,9189	0,8986	0,8942	0,8414	0,1395
95% confidence interval	0.9340 to 0.9807	0.8052 to 0.9404	0.7555 to 0.9237	0.8533 to 0.9559	0.8181 to 0.9446	0.8105 to 0.9421	0.7220 to 0.9121	-0.1717 to 0.4255
P value (two-tailed)	P<0.0001	P<0.0001	P<0.0001	P<0.0001	P<0.0001	P<0.0001	P<0.0001	0,3781
P value summary	***	***	***	***	***	***	***	ns
Is the correlation significant? (alpha=0.05)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
R squared	0,9297	0,7940	0,7424	0,8444	0,8075	0,7995	0,7079	0,01947

Figure 2: The analysis of correlation was performed via Graph Pad Prism 5.0.



Linear regression point out that all the variables are significant less than the ICT variable. In fact it is verified that all of these have one R2 very high and P-value is reliable for all variables except for the ICT.

Table 5: Best fit values

	POP	GDP	EXP	EPC	EU	AT	IG	ICT
Best-fit values								
Slope	89.69 ± 3.900	930500 ± 74930	275300 ± 256400.006942 ± 0.0004712		0.002306 ± 0.0001780	37.70 ± 2.985	280800 ± 28520	0.000006446 ± 0.000007232
Y-intercept when X=0.0	8995000 ± 1346000	-164700000000 ± 258600000000	-51580000000 ± 88490000000	1591 ± 162.6	1657 ± 61.43	-5680000 ± 10300000	-55710000000 ± 9842000000	20.14 ± 2.496
X-intercept when Y=0.0	-100300	177000	187300	-229200	-718800	150600	198400	-3125000
1/slope	0.01115	0.000001075	0.000003632	144.0	433.7	0.02652	0.000003562	155100
95% Confidence Intervals								
Slope	81.81 to 97.58	779100 to 1082000	223500 to 327100	0.005990 to 0.007895	0.001946 to 0.002666	31.67 to 43.74	223100 to 338400	-0.000008170 to 0.00002106
Y-intercept when X=0.0	6275000 to 11720000	-217000000000 to -112400000000	-69460000000 to -336900000000	1263 to 1920	1533 to 1782	-7762000 to -3598000	-75600000000 to -35820000000	15.10 to 25.19
X-intercept when Y=0.0	-142800 to -64490	142500 to 203200	148400 to 215700	-319400 to -160500	-913600 to -576400	112300 to 179500	157600 to 227600	-infinity to -723400
Goodness of Fit								
r <sup>2</sup>	0.9297	0.7940	0.7424	0.8444	0.8075	0.7995	0.7079	0.01947
Sy.x	2460000	47260000000	16170000000	297.2	112.3	1883000	17990000000	4.561
Is slope significantly non-zero?								
F	528.9	154.2	115.3	217.1	167.8	159.5	96.93	0.7944
DFn, DFd	1.000, 40.00	1.000, 40.00	1.000, 40.00	1.000, 40.00	1.000, 40.00	1.000, 40.00	1.000, 40.00	1.000, 40.00
P value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.3781
Deviation from zero?	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Not Significant
Data								
Number of X values	42	42	42	42	42	42	42	42
Maximum number of Y replicates	1	1	1	1	1	1	1	1
Total number of values	42	42	42	42	42	42	42	42
Number of missing values	0	0	0	0	0	0	0	0

#### 4. CONCLUSIONS

In conclusion, it can be said that certainly all the parameters analyzed point out that the only parameter ICT is not statistically significant. ICT development, in my opinion, can be strictly linked to EU parameter. Therefore, investment in this direction cannot worsen the CO<sub>2</sub> emission levels. At the same time, the use of clean resources such as electricity but above all technology can significantly cannot change the CO<sub>2</sub> emission rate. It highlights the need to find reliable data on the pollution rate caused specifically by the use of obsolete products, scheduled obsolescence but above all that linked to technological progress (ICT). Precisely with reference to the latter, an exponential increase on a world scale can be deduced as abundantly mentioned. The increase in imports/exports of goods and services as well as the demographic growth generate a significant increase of CO<sub>2</sub> emissions that can be linked to the environmental pollution. Moreover, the international agreements signed by hundreds of nations and world powers is still there the need to implement stringent measures aimed at reducing CO<sub>2</sub> emissions. Although, climate changes is linked to the industrialization and there are bills blocked by years of preparation. The disposal of highly polluting waste and the discourse of renewable is still being structured mainly in continents such as the African one. Technological progress should lead indirectly to the creation of Smart Cities, innovative factories, agriculture with modern cultivation techniques that allow the elimination of pesticides by developing eco-sustainable solutions. In addition, in order to reduce pollution from scheduled obsolescence products, measures should be implemented to extend the legal guarantee of an asset from the current 2 to 5 years for all products and to 10 for cases where it is reasonable to assume a particularly long duration. To oblige manufacturers to ensure the availability of spare parts for as long as the asset is put into circulation in the market and in any case with a cost always proportionate to the selling price of the asset. Implement dissuasive measures such as penalties and fines in an attempt to dissuade companies from resorting to illegal and improper disposal practices.

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## ACCOUNTING PROFIT IN SPANISH LEGISLATION

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### ABSTRACT

*The main goal of this paper is to study the accounting profit in the spanish jurisdiction. For this purpose the accounting profit and its integration in accounting and tax legislation of Spain were analized. In accounting terms the study focus on the Commerce Code and Accounting law. On the one hand, the assumption of accounting profit in corporate income tax law and the significance of its economic periodization were investigated. The results show that the spanish Commerce Code recognizes a relevent role to accounting profit. It also recognizes that it is very important for the companies to give financial information about their economic lives. It establishes specific issues, such as the elements of the annual accounts, and how the net profit should be determined. On the other hand, an effort was made to understand and analyse the relevance of the periodization of the corporations' economic life. It happens having as underlying the accrual basis' accounting principle. This may occur due to several economic, financial and legal reasons. Concerning the economic reasons it is necessary to define economic periods for management evaluation and the distribution of the results to the company's owners. Financially, the company has to assure all the financial needs to maintain its activity. In legal terms, it is important to determine tax periods that can establish the tax due by the entity's economic performance. The analysis of article 10 of the spanish corporate income tax law allows us to conclude that the spanish tax legislator recognizes the tax direct valuation method to determine the taxable profit. It means that the net profit determined under accounting rules is used to calculate the taxable basis that will be subjected to pay income tax by the national economic entities.*

**Keywords:** *accounting profit, corporate income tax, economic periodization, Spain, taxable profit*

### 1. INTRODUCTION

Depending on the area, there are several definitions of result. According to Hicks (1974) it is the maximum value that one person or entity can consume during a week, and maintaining the same financial situation that it had in the beginning of the week. This idea, in the economic area, relates the result to the concept of utility. For García Fernández (2000) the utility obtained with the development of an economic ativity depends on two situations. First, the satisfaction obtained with the consumption of certain goods and services; and second, maintaining the capacity to regenerate wealth in the future. Vidal Hernández-Mora (2003) presents a financial concept of what should be considered the result, stating that in his opinion the result is a magnitude freely used in the business sphere to determine if the business management is correct or not. However, its determination and goal can differ depending on the finality. This way, it is possible to distinguish three kinds of results: economic result, accounting result and tax result. In economic terms the result can be understood as the resources that can be extracted from the entity's patrimony without diminishing its wealth or economic capital (Hicks, 1974). In other words, it is the amount of the company's property that can withdrawn or spent without reducing the invested capital. It is also supposed to maintain the capacity of service of the economic unit, as well as to preserve the purchasing power of own financing (García Moreno, 1997). As explained by L. A. M. Pascual and Zamora (1998) the economic result shall be determined by

deducting from the income generated the amount expended to generate that income, including among them the opportunity cost of capital. This means that the result is the part of the sales income that remains after having paid all the factors that intervene in the production. Economic activity depends not only on the satisfaction of consumption of certain goods or services, but also on the sustainability of the company's capacity to generate such wealth in the future (Menéndez Menéndez, 2011). Thus, to determine the result it is necessary to take appropriate measures for the conservation or sustainability of the capital. It is essential to include all the expenses in order to not overestimate the result. The surplus can be distributed by the owners of the capital. So it is important that the result reflects the true and fair image of the company (Flood, 2019). Otherwise, the company may enter into a process of undercapitalization, resulting in a decrease in financial liquidity that may lead the company to lose its ability to act (Vidal Hernández-Mora, 2003). Accordingly, García Moreno (1997) considers that this concept is next to the concept of residual benefit.

## **2. ACCOUNTING RESULT**

As it was said already, the concept of result is susceptible of several definitions, depending on the perspective. We briefly address the concept of economic result which, although not being our specific object of study, is related to the concept of accounting result or accounting profit. In these terms, the result is the difference between the income and the expenses produced by the entity during the economic year, adding or withdrawing to that difference the positive or negative variation of the final stocks with respect to the initial ones, and it is calculated from the income statement (Chico de la Cámara, 2006). This statement is composed by the income and the expense items, so the operating profit is accurate in this document (LLP, 2018). The operating result comes from the exploration activity of the entity, it should be distinguished from others that do not have the same qualification. Regarding the expenses, they are all the costs of the economic year that were incurred to obtain the income. They can be the consumption of goods, raw materials and other consumable goods, external expenses, expenses with personnel, taxes (including the entity's income tax) and all operating expenses that meet that general definition. Other accounting items can be recognized as expenses, such as amortizations, depreciation and provisions, which are designed to recognize the loss of value of the asset or right (Juan Martín Queral, López, & Galiardo, 2013). The operating incomes are the positive operating result's component, in other words, they are entity's sales and services. They also recognize the variation in inventories and the work done for the company itself. After determining the operating result, other incomes and expenses that do not relate with the ordinary company's activity are added, such as the financial ones (Nabais, 2018). The legal obligation to prepare the corporate's annual accounts and the inherent determination of the net profit are established in the Spanish Commerce Code (Codigo de Comercio). This legal disposition imposes the obligation to present the financial statements at the end of the economic period. (Lapatza, Fernández, & Márquez, 2013). It also determines what kind of financial documents it is necessary to present and that the manager is the person responsible for their formulation. Thus, according to article 34, it is recognized as essential to prepare the statement of financial position, financial performance, cash flows, changes in equity, and the balance sheet annex. This imposition has as underlying the consideration of the assumptions made by the international accounting organizations, such as IASB (Flood, 2019). This entity establishes in its conceptual framework the objectives of the financial reporting, which go in the same direction that the Spanish law determines (LLP, 2018). So, IASB conceptual framework considers that the financial reports should provide information about the entity's financial position, financial performance, cash flows and changes in the financial position which are not caused by financial performance (e.g. share issues) (Freitas, 2007; Melville, 2015). J.M. Queral, Serrano, López, and Ollero (2019) consider that this juridic determination represents the importance of the

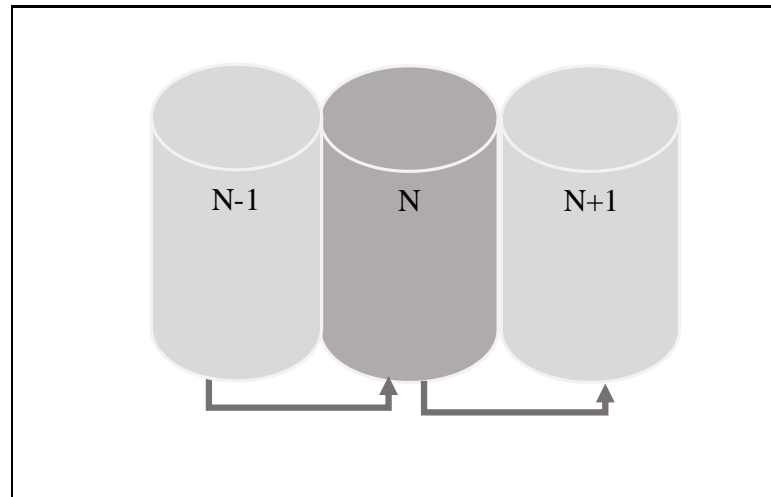
annual accounts as an informative overview of all the accounting process made by the corporation during the economic year. These set of accounting elements form a unit that must be analysed and interpreted as a whole since they are the basis to prepare other complementary financial documents (Ortega, 2015). The Spanish Commerce Code, in article 35.2, also makes considerations about how the accounting profit is obtained. It explains that the net profit is calculated having as underlying the incomes and the expenses taking into consideration the accounting standards. The statement of financial performance has the specific goal of finding out the company's positive and negative returns. The accounting profit is very useful for tax purposes (Lal, 2012). Corporate income tax law resorts to the direct estimation regime to sustain the determination of the corporate income's tax (J.M. Queralt et al., 2019). Accounting profit is taken as the starting point for the determination of the fiscal result and this requirement is of central importance for fiscal purposes (Gadea, 2008). Article 10 of the LIS, establishes that the taxable base will be constituted by the amount of income in the tax period, reduced by the offsetting of negative tax bases of previous tax periods. According to the same disposition it will be calculated, correcting the accounting profit under the determinations requested by the code. So, the result determined according to the accounting standards will be considered as a starting point to determine the taxable result (L. M. Pascual, Gálvez, Gómez, & Pino, 2013). This disposition expressly determines that the accounting profit is calculated considering: 1) the Commerce Code's norms; 2) other laws relating to the mentioned determination and, finally, 3) the dispositions that are dictated in the development of the mentioned norms. For the second condition the Capital Companies Law will be considered. Concerning the third requirement must be considered, essentially, the Spanish General Accounting Plan and General Accounting Plan for Small and Medium-sized Enterprises and specific accounting criteria for micro-enterprises (Lapatza, 2007). The application of the accounting standards is mandatory, even if they have regulatory character, this condition has as main goal the uniformization and standardization of the accounting information (Lapatza et al., 2013). The accounting standards do not define the net income, however they establish the rules set for its determination. The correct determination requires all the incomes and all the expenses to be reflected in the results account (Lal, 1981). If this is not observed, the accounting profit is not correct and the financial position statement does not represent the company's real patrimonial situation (Gadea, 1998). Thus, the obligation to apply the accounting principles and the valuation rules accrue from the Spanish General Accounting Plan. To L. A. M. Pascual and Zamora (1998) the accounting profit presents a relative magnitude and a temporal one as well. Having a relative magnitude means that only at the end of a company's life it is possible to determine the result in absolute terms, because only in that moment the entity ceases its activity and does not need to maintain the productive capacity. On the other hand, the temporal magnitude represents the need for the company's life to be fractioned into time intervals, usually in annual periods. According to Amat, Aguilá, and Marín (2018) this period of time is called economic exercise and it allows each period to be isolated from the previous and the following economic periods. This fractionation allows business leaders to have continuous and relevant information to make economic-financial decisions and to remunerate the investors, otherwise this would not be possible.

### **3. THE PERIODIZATION PROCESS**

The process called accounting periodization must be carried out before determining the result in accounting (García Novoa, 1998). This procedure has the purpose of delimiting the expenses and the income that correspond to the period for which the result is to be calculated, regardless of the payment of expenses or the collection of revenue (Amat et al., 2018). This process will lead to adjustments, which have materialized in a series of accounting corrections (Constans, 2012).

The objective is the aduated allocation of expenses and income in the period in which the specialization does not coincide with the payment dates or corresponding receipt (Deegan, 2016). Periodization is a consequence of the application of accounting principles, in particular the principles of accrual, correlation of income and expenses, as well as the prudence in valuation and registration.

*Figure 1: Representation of the accounting periodization process*



*Source: Author*

Thus, Article 38 d) of the Commerce Code confirms the value of this underlying assumption because it expressly provides that the income and the expenses shall be charged to the financial year to which the annual accounts relate, independently of the payment date or collection. This assumption is recognized in the IASB's Conceptual Framework, that considers the accrual basis as an essential underlying assumption (Walther, 2017). The same relevance is given by the spanish accounting standard, in paragraph 3 of its theoretical framework. It is consensual that the result, from an economic point of view, has a single magnitude and can only be measured exactly at the end of the company's economic life. The determination of the periodic result is an unavoidable necessity as a consequence of several factors of both economic and legal nature. They are: 1) need to determine the result of the period for mercantile and fiscal effects; 2) management of the activity and control of the management itself; 3) financing of the activity; 4) return to the capital owners who invested in the company. The division into financial years is only possible through the periodization process, which is strictly related to the specialization or independence of the exercises (L. A. M. Pascual & Zamora, 1998).

*Table following on the next page*

*Table 1: hypothetical cases*

Economic operation	Period	Payment/ receipt moment	Value	Accounting records (adjustments)			Observations
				N-1	N	N+1	
Insurance cost	June/N until may/N+1	June/N	100		1) Payment 2) 50 of Cost	3) 50 of cost	Corresponding cost imputation at each period, although the payment occurred in N.
Payment of interest in advance	January/N	December /N-1	20	1) Payment	2) 20 of cost		Although the payment occurred in N-1 the interest refer to N. moment they have to be recognized.
Electricity cost	March/N	April/N	25		1) Cost and Payment		The payment and cost happened in the same economic period.
Receipt of interest	January/N +1	January until December /N	5		1) 5 of Income	2) Receipt	Although the receipt occurred in N the Interests refer to N-1, moment they have to be recognized.

*Source: Author*

#### 4. CONCLUSION

The spanish Commerce Code acknowledges the relevant role of the annual presentation of accounts done by the companies. Therefore it gives particular instructions about this process, determining the obligation to prepare financial statements, determining who is responsible for this procedure, what kind of financial information needs to be given and how the accounting profit is determined. This legal disposition does not differ from the international accounting harmonization, following the essencial of IASB's conceptual framework. The relevant role of accounting is recognized by the spanish corporate income tax law. It assumes accounting profit as a starting point to find out the taxable base. It does not mean that all the accounting rules are considered valid from the point of view of taxes, and so some of them may be subjected to tax adjustments. For a correct determination of accounting profit it is essencial that all the period's incomes and expenses are recorded. For this purpose it is important to determine particular rules about this recognition, which means to know in which period the positive and negative components must be acknowledge. The accounting periodization process supports this procedure and it has as underlying the accrual basis. This assumption is also identified by the IASB's Conceptual Framework.

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# THE IMPACT OF ECONOMIC CRISIS ON ENTREPRENEURSHIP AND STRATEGIC PERFORMANCE

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## **ABSTRACT**

*This research investigates the impact of economic crisis on entrepreneurial capabilities and strategic performance of small and medium-sized enterprises. As such, we aim to evaluate the factors that influence entrepreneurial action and strategic performance, by assessing business performance in times of crisis. The research method was based on the sector analysis, substantiated by the literature review. Based on a sample of Brazilian firms our results show that the size of the company is irrelevant, both for taking strategic actions and for speed in undertaking growth actions. It is concluded that MPE's achieve greater speed of growth actions undertake joint actions when they have technological capabilities.*

**Keywords:** *Technological capabilities, Leadership capabilities, Strategic performance, Entrepreneurship, SME's*

## **1. INTRODUCTION**

The incidence of economic crises often leaves many ventures at risk, especially small and medium-sized enterprises. Because they have a lean organizational structure and, in general, little knowledge about strategic management, behavior, and entrepreneurial skills, many of these businesses do not withstand periods of economic turmoil and end up declaring bankruptcy within five years of existence. Due to the relevance of the topic and to the scarce studies available on the competitive performance of Brazilian companies in times of crisis, this work has turned to the following questioning: leading companies to quickly take strategic action in an emerging economy? In order to answer this question, the study followed the line of research developed by Yang and Meyer (2015), in which they investigated the competitive scenario of small and medium enterprises of China, from the combination of behavioral theories (BTF - The Behavioral Theory of the Firm) with Resource Based View (RBV). The main objective of the study was to analyze aspects related to entrepreneurial behavior in small and medium-sized businesses, which make it possible to make strategic decisions quickly, in fast-growing environments. The research also sought to understand the entrepreneurial capacities of this type of company and to verify what strategic actions are commonly practiced in a turbulent environment, and how they can improve the performance of the enterprise.

## **2. LITERATURE REVIEW**

### **2.1. Entrepreneurship: origin and concept**

The concept of entrepreneurship encompasses two main theoretical approaches: Economic (or Schumpeterian) theory and Behavioral theory. The two versions depart for the universality and breadth of the concept of entrepreneurship, which comes to be seen as an individual

phenomenon, linked to the creation of companies, initiated through the use of an opportunity or simply the need for survival, as well as “a social phenomenon that can lead the individual or a community to develop abilities to solve problems and to seek the construction of the future itself, that is, to generate Social Capital and Human Capital” (Zarpellon, 2010, p. 48). Economic theory argues that the essence of entrepreneurship lies in the cunning and creative competence given to new business opportunities, with an interest in creating a diverse use of financial, human and material resources, and how to move them from their traditional system, subjecting them to unprecedented creative combinations for business expansion. Behavioralist theory, in turn, views the entrepreneur as a source of formal authority, with the ability to transform what is obsolete into something modern / new. For Zarpellon (2010, p. 49), theorist economists “associated the entrepreneur with innovation” and behaviorists emphasized “attitudinal aspects such as creativity and intuition”. In the scope of the administrative management, it is pertinent to distinguish the concept of entrepreneurship, due to the subjective sense revealed by the functional differentiation given to the entrepreneurs and managers within the organization. By entrepreneur, it is understood that one that reforms or revolutionizes an existing pattern of production, bringing new ideas and opening a new source of commercialization of a product or process. It is someone who takes risks and deploys new management models, motivating people to invest time and resources in their new idea (Fillion, 2000). Entrepreneurship, therefore, focused on the knowledge and economic development of the business and the local market, contributes to the better performance of administrative activities, through the promotion of new ideas, thoughts and transformative attitudes, encouraging cost reduction and increased productivity as well such as business longevity.

## **2.2. Entrepreneurial Behavior and Entrepreneurial Capacity**

The theoretical positioning on entrepreneur behavior and entrepreneurial skills is focused on the entrepreneurial spirit and the responsibility for their choices during the execution of the enterprise, which should lead to the planning and organization of the business structure, using the necessary resources and assuming all the risks and rewards involved. Drucker (1987) defines entrepreneurial spirit as a method by which individuals seek opportunities without fear of risking, even in the face of social, economic and political difficulties, through innovation, to satisfy their needs. Drucker (2007) ponders that there are seven sources for an innovative opportunity. Are they: a) be prepared for the unexpected; b) understand the paradox between what is and what should be; c) be attentive to the needs of change; d) knowing the right moment to make a structural, demographic change; e) change of entrepreneurial attitude, having, for example, an innovative perception about a certain economic moment, and; f) know the moment to seek new scientific knowledge. The profile of the entrepreneur includes a list of characteristics directed to personal and professional fulfillment, very well described by McClelland (1961, apud Silva, 1991), and divided into two categories: Realization (Category A) and Planning and problem solving (Category B). The first is represented by the pursuit of opportunity and initiatives, demand for quality and efficiency, persistence and independence, and self-confidence. The second category involves notions about taking calculated risks, continuously seeking information and setting goals. Research by Rotter (1966 apud Chiavenato, 2007) complements thinking by reporting that there are two types of beliefs to achieve success: internal control focus, that is, through effort it is possible to achieve the objectives, and; external focus of control, here it is understood that chance or luck leads the individual to succeed. Dornelas (2008) highlights other characteristics pertinent to successful entrepreneurs, such as: commitment, organization, dedication, creation of values for society. Dolabela (2000) still lists some reasons that lead individuals to undertake. These are: self-realization, search for development, support of new SMEs and expansion of the technological base. All the mentioned characteristics establish a singular character to the entrepreneur, to contemplate their behavior



and personality, variables that interfere directly in the development of the business. In this sense, the strategic planning process becomes essential for a better performance of the entrepreneurial activities and for the structuring of the organization (Machado & Silva, 2011).

### **2.3. Strategic Planning: concept and implications for business performance**

Planning, in the entrepreneurial vision, consists of strategically organizing each stage of the business management process, defining where the company will go and how it will achieve its goals and goals. The analysis of the strategic situation of the environment, the strengths and weaknesses, the definition of objectives and strategies, the constitution of functional and operational strategies, and the execution and evaluation of it are part of the content that involves the entire strategic planning process (Maximiano, 2008). The strategies and definitions given for strategic planning can be reformulated and adapted to any business reality, it is sufficient to adapt them to the business purposes. The entrepreneur, in this context, needs to ensure the effectiveness and effectiveness of each strategic action defined for the business. These strategies must be supported by decisions regarding the organizational structure, and the formulation, identification and execution of these actions must be carried out by all those involved (managers, employees, suppliers, customers and the like) to ensure commitment to the implementation of the strategic plan (Bateman & Sneel, 1998). It should be emphasized that strategic planning must carry out continuous processes of monitoring, analysis, information, perception, review and reaction, so that the decision-making process is as close to the real needs of the business.

### **2.4. Small and Medium Business, National Legislation and Strategic Analysis**

According to Complementary Law 123, of December 14, 2006, MSEs are Microenterprises of a business company, a simple company, a limited company and the individual entrepreneur, "duly registered in the competent bodies" and with gross annual income equal to or less than R\$ 360.000,00; exceeding this amount, MPE becomes a Small Business Company (SBC) (Brasil, 2006). After this law, the General Law was created, focused on the Individual Micro Entrepreneur (IME), which is classified as "a self-employed person with registration of up to one employee (not being a member or holder of another company) and has an annual gross revenue of up to R\$ 60,000.00" (Sebrae, 2014a, p. 7). Complementary Law 127, of August 2007, classifies and determines more specific parameters for Microenterprises and small businesses, when defining MPE, according to the following criteria: "the company with annual gross revenue of up to R \$ 240,000.00 is characterized as Microenterprise, while the company with annual gross revenue exceeding R \$ 240,000.00 is characterized as a small business" (Dornelas, 2008, p. 23). With these laws (LC nº123 / 2006 and 127/2007), there was a significant advance in the rules and conditions of development for small businesses, involving greater market opening and improving the tax relations of MSEs. Sebrae (2007) points out that MSEs serve as a basis for sustaining the consumer market and for the country's economy not to be in the process of stagnation, being an option for consumers who wish to consume without spending much. However, nowadays, MSEs experience problems of organizational structuring more frequently, due to enter the market initially informally, only then decide for regulation. The shortcomings most commonly experienced by small businesses are the lack of "environmental analysis, understanding of their processes, performance appraisal, strategic planning and cost calculations" (Manganote, 2005, p. 125). To escape this reality, MSEs must execute their administrative processes in an organized, rational and professional manner, seeking greater flexibility and speed for decision making. The "greater flexibility of action is associated, in many cases, with a second factor, which is the adaptability of the small business to market changes, especially when these changes require frequent innovations or changes of products" (Richers, 1997, p. 38).

### 3. METHODS

This research has a descriptive, explanatory and exploratory character, and it was used the quantitative analysis as investigative method, opportunized by a field study. The primary data collection was performed through the application of a questionnaire, composed of 27 questions, and treated through descriptive statistics and multivariate analysis. The survey was based on the studies conducted by Yang and Meyer (2015) in China on variables that impact small and medium-sized firms in emerging markets and fast-growing markets. The results of this research, together with other relevant scientific contents, defended by Cyert and March (1992), Chen, Lee and Lay (2009), among others, led to the formulation of six hypotheses, presented in pairs, representing the dependent and independent variables. The dependent variables configure the velocity in the strategic action take and the speed in undertaking joint actions, for the three pairs of hypotheses. The independent variables portray the size of the company (H1), technological capabilities (H2) and leadership competence (H3). In order to answer the research questions, to prove the validity of the hypotheses and to fulfill the objectives of the study, an initial bibliographical survey was carried out in reference works (annals, theses, dissertations, books, manuals and reports) , consulting not only the classical authors, but also researchers who produced works in recent years. The analytical procedure covered the theoretical-empirical studies developed on entrepreneurship and strategic performance, focusing on the behavior of the entrepreneur in the face of an economic crisis. The state of Maranhão, a member of the Northeast Region of Brazil, was chosen as the research territory. According to the Central Business Register, there are 76,812 companies established in Maranhão, operating in different sectors (Instituto Brasileiro de Geografia e Estatística, 2012). These companies constitute the universe of research, from which the sample was delimited. The mathematical formulation used for the calculation involved the following variables: population (76,812), normal standardized variable associated with confidence level (for 90% = 1.64), true event probability (0.5) and sample error (0.08), and resulted in a sample of 105 companies. The survey reached an audience beyond the target segment. Of the 109 people who answered the questionnaire, 80 belong to Micro and Small Companies, 21 are part of Medium-sized Enterprises, and only 8 work in Large Enterprises. It was therefore found that 101 companies belong to the target public (micro, small and medium-sized enterprises). These companies belong mainly to the private sector, leaving only five belonging to the public sector, and two are non-governmental organizations (NGOs) or non-profit organizations. Regarding the structure of the questionnaire, it is highlighted that, excluding Section 1 - Basic Data, the questions in the other sections were elaborated with Likert scale responses. The choice of this technique is due to the fact that it is relatively simple, easily understood by the respondents and allows to deal with the different dimensions of the variables. Responses ranged from 1 to 5, with 1 being the lowest response ("much slower" or "much worse than competitors", or "totally disagree") and 5 the higher response rate ("much faster" or "much higher than competitors", or "totally agree"). As a way of validating the questionnaire, in addition to using a model similar to the one applied by Yang and Meyer (2015), a pilot test was carried out with 20 copies, with no difficulty in its interpretation. Immediately after the data collection period (April 26, 2017 to May 18, 2017), the Cronbach Alpha coefficient was applied to test the reliability of the results. In order to examine the relationships between the different variables and thus to be able to evaluate the model, we applied statistical tools of descriptive analysis and linear regression. In the descriptive analysis, the objective was to describe the characteristics of the respondents, while in the multivariate analysis (using the factorial analysis), we tried to confirm the hypotheses proposed. In this research, the exploratory factorial analysis was used, indicated in the embryonic stages of the investigation, and when the researcher's previous knowledge about the dependence relations of the variables.

The method used to extract the factors was Principal Component Analysis (PCA) and the rotation of the factors was the orthogonal Varimax. The Kaiser-Meyer-Olkin test (KMO) and the Bartlett sphericity test (BTS) were also applied.

## **4. ANALYSIS OF DATA OBTAINED AND DISCUSSION**

### **4.1. Descriptive statistics**

Brazil has been suffering the negative effects of international crises and, more recently, the internal economic and political crisis. These effects can be felt in the provision for new investments, both in the opening of start-up ventures and in the expansion, modernization, innovation or diversification of existing businesses. In spite of the incentives given by the government, there was a significant drop in this type of initiative in the first half of 2014. At this juncture, GDP growth (in percentage), according to IBGE 2014, shows continuous falls and rises prospected for until 2018 (Sebrae, 2014b). Given this scenario, the Northeast Region – one of the poorest and with the most alarming indicators of inequality – ends up providing an excellent empirical field to study and understand competitive organizational dynamics in an environment subject to turbulence. In Maranhão, it was observed that most managers, as well as in most small and medium-sized Brazilian companies, make decisions without having all the necessary information in hand, and for this reason can not foresee the results of these measures with a high degree of sharpness. Due to the broad market context and full of growth opportunities, more and more companies are opening up or coming to Maranhão, increasing competition, and consequently requiring more strategic actions by companies to stay in the market. The evaluation of the profile of the entrepreneurs, in these circumstances, contributes to the evolution of the business, insofar as it offers information about their entrepreneurial capacities and managerial characteristics, presenting positive perspectives of growth from the stimulus of the forces and the treatment of identified weaknesses. Considering the entrepreneurial behavior, the positive factors considered important for the establishment of organizational success arise from the moment the entrepreneur invests in himself and the business in an appropriate way, planning with the future thinking and investing in the present. To initiate the study proposed in this work, we initially carried out analyzes on the reliability of the research instruments.

### **4.2. Reliability analysis of the research instrument**

The reliability analysis of the research instrument was assured by means of Cronbach's alpha, previously mentioned. This coefficient tells the internal consistency of a scale by analyzing the average correlation of one variable in relation to the others. For this study, it was determined that Cronbach's alpha was 0.872 for non-standard items and 0.888 for standardized items, which is well above the minimum acceptable value, showing that the variables are organized in an adequate way for the analyze. The calculation was made by the statistical package Statistical Package for the Social Sciences - SPSS, produced by IBM. During the research, no gains were observed in the hypothesis of elimination of any variable, since the Cronbach's alpha coefficients calculated by the SPSS system were all lower than the coefficient based on standardized items. This means that no single variable has the capability to increase reliability. Failure to identify variables subject to exclusion reinforces the validity of the questionnaire applied and its suitability for subsequent analyzes. In addition, it shows the strength of the constructs already tested in previous research.

### **4.3. Factor analysis**

This work was based on factorial analysis as an instrument to identify, in the population studied, the underlying dimensions that explains it. For this, some techniques were applied, such as the Principal Components Analysis (PCA) for extraction of the factors.

The number of extracted factors was obtained by the eigenvalue criterion, greater than one (1), and the rotation was performed by the Varimax orthogonal rotation method. The Kaiser-Meyer-Olkin index (KMO) and the Bartlett sphericity test were also used to explore the suitability of the items to the factorial analysis.

#### 4.4. Hypothesis testing

Although the correlation analysis did not confirm or refute the hypothesis **H1a** (The smaller the size of a company in the market in which it operates, the slower it is in taking growth actions), it is legitimate to say that the frequency of the answers shows that the size of the companies is irrelevant with regard to the speed of strategic action, which leads to conclude that this hypothesis. In relation to the speed to carry out mergers or acquisitions of companies, the hypothesis **H1b** is rejected (The smaller the size of a company in the market in which it operates, the slower it is to undertake joint actions), because the counting of the answers has evidenced that the studied phenomenon (speed in carrying out growth actions) is not slower in small companies or faster in large companies. The technological capabilities of companies are contained in the questions in Section 2 of the questionnaire applied. The correlation matrix between the variables involved showed results below 0.500. At the outset, there is a reasonable correlation between speed in growth action - Introduction of New Products (INP) - and two variables of technological capabilities: Response to Technological Changes (RMT) and Continuous Innovation Practices (PIC). The other correlations are very close to the minimum value considered adequate (0.500), which does not allow to validate the hypothesis from the factorial analysis of the complete set of data. The analysis of the correlations confirms the hypothesis H2a, that there is a greater speed in the actions of growth by the Micro and Small Companies, the stronger they are in their technological capacities. It should be noted that the variable "Stage in which the company is in terms of technology (ETT)" presented a weak correlation with the velocity variables in the taking of strategic actions (below 0.500). On the other hand, the "Continuous Innovation Practices" presented a strong correlation with the "Technological Capacities", in all the analyzed issues. The correlation matrix calculated from the complete set of data showed a weak correlation between the variables related to the technological capabilities and speed in the joint actions (hypothesis H2b). All correlations showed values below 0.500, requiring analysis of these references only with Micro and Small Companies. In this case, a new round of factor analysis was performed in the SPSS system, considering only the questionnaires obtained with the 80 participating MSEs. The results were also not encouraging. The 5 variables related to technological capacity were identified as "equal to the competitor" by 34.4% of the respondents and, as "better than the competitor", by 44.22% of them, representing a cumulative frequency of over 86%, leaving little less than 14% of respondents as conscious acknowledgers that the technological capacity of their companies is "far better than the competitor". The strategic leadership competencies are related to Section 3 of the research questionnaire and include 6 variables: Proper positioning of the company in the market (PAM); Rapid strategic adjustment of targets and operations (SAR); Ability to quickly reorganize enterprise resources (RRE); Formation of ambitious goals and strategies for the company (MMA); Ability to rapidly increase or reduce activities (ARA); and Follow new and creative ideas or proposals for taking advantage of opportunities (NCI). All correlations were greater than 0.500, except for the correlation between Capability to follow new and creative ideas or proposals for use of opportunities (NCI) and Entry into new markets or expansion of existing markets (EEM). However, the correlation of 0.499 is at the border of the minimum acceptable, which validates the hypothesis H3a. We also observed the low correlation in all the variables that involve mergers and acquisitions of other companies (FAE). This is explained by the fact that mergers or even formal strategic alliances are not very common in the region reached by the research. Already, alliances and cooperative agreements are more common.

And these alliances and agreements were most noticeable when focused on rapid adjustments in the goals and operations strategy (RAE), to rapidly increase or reduce activities (ARA) and to follow new and creative ideas taking advantage of opportunities (NCI). It is therefore noted that there is a correlation between strategic leadership and speed in joint actions – not as strong or broad as expected – which leads to confirm the hypothesis H3b, with the proviso that the correlation is evident only in alliances and cooperative agreements and not noticeable in mergers or acquisitions of other companies, a more formal and uncommon process in the region. Before analyzing the data, the hypotheses test is summarized in the following results:

- **H1a:** The smaller the size of a company in the market in which it operates, the slower it is in taking stock of growth - **Refuted**;
- **H1b:** The smaller the size of a company in the market in which it operates, the slower it is in undertaking joint actions - **Refuted**;
- **H2a:** The stronger the technological capabilities of a company, the faster its take of growth stocks - **Confirmed**;
- **H2b:** The stronger the technological capabilities of a company, the faster it is to undertake joint actions - **Refuted**;
- **H3a:** The stronger the competence of a company's strategic leadership, the faster it is at taking action for growth - **Confirmed**;
- **H3b:** The stronger the competence of a company's strategic leadership, the faster it is to undertake joint actions - **Confirmed**.

Faced with each hypothesis, it was observed that size is not decisive for influencing the speed with which companies take strategic actions, such as the formatting of joint actions (mergers and acquisitions of companies) or cooperative alliances. The correlation analyzes processed did not indicate a relevant link between the variables, in order to establish a cause and effect relationship that deserves consideration. It is important to add that the results that indicated the low correlation between the size of the companies and the speed in the strategic action were made for both the total group of companies and only for those of small and medium size.

## 5. CONCLUSION

This research had as main objective, to analyze the pertinent aspects to the entrepreneurial behavior of the small and medium businesses in environments of rapid growth, in order to understand the posture of the entrepreneurs of this segment, and how this can contribute to the better organizational performance. It also sought to verify how these companies practice strategic actions. The study was delineated based on the line of research developed by Yang and Meyer (2015), in a survey carried out in China. The conclusions of this research have important effects in the area of business management of micro and small businesses, because they bring peculiar aspects that comprise entrepreneurship and strategic performance in rapidly changing environments and times of crisis. A first point to be highlighted is that the size of companies has little influence on any variable studied. There is no correlation in this sense, which demystifies the idea that SMEs are not fast enough to take strategic actions or to make partnerships. It was also observed that the entrepreneurial behavior is influenced by technological compacities. SME managers have been more agile in taking strategic actions that lead to performance than managers of the larger companies. However, the formatting of partnerships occurs more clearly when there are strategic alliances, and this is due to the fact that it is not common or is not common in local business relations, especially in the scope of SMEs, to make acquisitions or mergers. Considering that this activity is more common among medium and large companies. In the course of this research, some limitations were identified in the method used, which deserve attention. These restrictions have led to the possibility of further research. The first obstacle concerns the issues applied to entrepreneurs.

The original questionnaire by Yang and Meyer (2015) had been reproduced verbatim, which is composed of some very similar questions among themselves, a fact that may have induced the respondent to think that he had already adjudicated a questioning, thus becoming negligent with other inquiries. The second limitation found refers to the excessive number of questions, which made the questionnaire tiresome for the respondent, and for that reason, some answers were given automatically and without much reflection. A third limitation relates to respondents. Because the questionnaire was arranged in the Google Docs platform and sent by email to the networks of contacts and social networks. As a suggestion of new research, it is recommended to review the questionnaire, eliminating similar or very similar issues. This action would reduce the number of questions, facilitating the mood of the respondent, and also avoid misinterpretation of the questions.

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## FACTORS AFFECTING THE ADOPTION OF ALTERNATIVE FINANCING METHODS FOR STARTUPS BY AFRICANS IN CHINA

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### ABSTRACT

*Alternative financing methods such as Crowdfunding, and Peer-to-Peer lending in the past few decades are becoming more sort after means of business start-up financing. On the other hand, traditional financing methods such as bank loans are now more difficult to acquire especially across African countries. Taking a sample of 410 Africans in China, this study examines the factors that affect the adoption of alternative financing methods for business start-ups. The results show that internet usage in Africa and China, length of residence in China, and the capital intensity of the type of the business to be started are all significant factors to the preference and adoption of alternative financing methods by Africans residing in China. Seeing as research into Africa's adoption of alternative financing is lacking, this study, this study provides insight where Africans are concerned.*

**Keywords:** *Alternative financing methods, Traditional financing methods, Generation Y, Business Start-ups*

### 1. INTRODUCTION AND LITERATURE REVIEW

In today's competitive market, traditional financing methods such as bank loans have become progressively difficult to attain. For Africans, it seems that the probability of getting loans is somewhat slimmer with just 5.4% being the share for loans across African banks compared to the 13.05% in other non-African developing countries. In the face of this dilemma, Africans looking to start their own businesses are forced to look for alternative means to financing their business. Majority of Business starters often look through other traditional financing methods such as using personal finances, or borrowing from friends and families. [1] This is due to the fact that few people know about the details of alternative financing methods such as Peer-to-peer lending, crowdfunding, and online market places among other forms. As a result they are unable to maximize the options available to them besides traditional methods [2], [3]. Business practice over the years have brought about a series of financing methods, majority of which are in use today in several advanced forms. Business startup financing mainly involves the use of personal savings, borrowing from family and friends, or getting bank loans among these traditional methods, small businesses and entrepreneurs predominantly resort to bank loans as a major source of business financing. As a result, traditional financing methods is 72 times larger by net worth compared to other financing methods [2], [4]. Akorsu et al. (2012) identified the standard issues which limit the ability for busienss loan seeks from getting the capital they require from banks. As banks are employing the 'cookie cutter' approach to deciding who to lend to, borrowers are faced with higher chances of rejection if their financial details and



spreadsheets or credit histories do not add up. In fact, most banks do not consider any other aspects such as a borrower's character besides the hard figures [6]. Today more than ever, the quick rise in alternative financing methods is undeniable. Businesses are now leaning more towards other sources beyond traditional methods such as bank loans. Among these, Crowdfunding and Peer-to-Peer lending are most prominent [7]–[9]. Much research has been done on the struggle that businesses across Sub-Saharan Africa face [5], [10], [11]. Besides Africa, Yiu Su et al posit that bank loan lending failure is just as serious an issue in Asia. Nevertheless, alternative financing methods like underground financing and venture capitalism are on the rise [12]. Now more than ever, it is quite visible that China's economy is growing rapidly due partly to its successful SMEs (Small and Medium Enterprises). It is also clear that China despite being a developing country, bears many differences to African countries. Rising up to be the second largest economy in the world has enhanced its technological, and economic advancement levels [13]. In fact, the resource availability difference gap is wider than ever between China and most African countries [7]. The SME growth level of China including its population of almost 1.4 billion surpasses that of Africa at 1.2 billion combined. Nevertheless, in both regions, what SMEs take their place as economical backbones [14]. In China's case, SMEs count as the despite the limited accessibility to credit or bank loans SMEs remain a backbone. As a result, Chinese are known to embrace alternative financing sources when compared to other nations [15]. Some methods practiced in China are known as 'underground financiers', or shadow banks, which bear their own risks [16]. In the case of Africa, Sub-Saharan Africa has been analyzed in details as regards financing and are known to experience difficulty with having access to small business startup financing [1], [10]. Most Sub-Saharan African countries face the most reluctance from banks when in search of loans. When they are given funding, it is usually on a short term basis and with high interest rates [5] [17]. Several factors can be expected to act as determinants for the preference of alternative financing methods among Africans residing in China. Factors such as their internet activity rates in Africa and in China, or level of online trust, their length of residence in China, their knowledge of alternative financing methods, and certainly the type of business they wish to start are key factors to be considered. One key variable for this study is their length of residence in China. When living in a new environment, adaptation is a requirement. When people migrate for one reason or another to a different environment than they are used to, be it to study or work, there is a need to adapt to the new culture, lifestyle, and ways of doing things there According to Berry et al, the process of social learning takes place over the course of time [18], [19]. Another key variable considered is the internet activity and online trust level of the respondent while they were in Africa compared to while they reside in China. Seeing as alternative financing methods are majorly online by nature, and require internet infrastructure availability, this variable is innegligible. Currently, internet infrastructure across Africa is still at a developmental stage despite the fact that internet growth on the continent can be linked to economic growth [20]. Internet usage across China on the contrary has grown over the last decade [21]. Following this reasoning, we first hypothesize the following.

Hypotheses 1A: There exists significant effects of residence length, internet usage, and online trust on the respondent's preference for alternative financing methods.

Capital intensity has been known to be a deterrent to many startup attempts.[22] Technology related startups tend to be capital intensive. This is evidential in IT startups who tend to gain capital more from alternative financing sources such as venture capitalist instead of banks [23]–[25], Manufacturing and hybrid style Startups more likely to be rejected but who have higher capital requirements at startup also shows reliance on alternative sources of financing [26].

As such, identifying the relationship between the business type the respondent aims to start and their preference is paramount. With this reasoning, we hypothesize the following.

Hypotheses 1B: There exists significant effects on higher technological intensive startups and the respondent's preference for alternative financing methods.

## **2. RESEARCH DESIGN AND METHOD**

### **2.1. Data Collection and Online Survey**

The data was collected through the means of an online administered survey. This was sent to Africans residing in China using a snowball sampling method. To ensure that all respondents were indeed Africans residing in China, the survey was started with an information page that allows anyone that doesn't fit into the description to exit the survey. Also, answer options for questions were limited. For example, when we ask the respondents the part of Africa they are from, the options are limited, to being from the north, south, central, east, or west. 'other' is added as an extra option wherein non-Africans could put in their nationality. Also, we asked for their place of residence in China with 'other' option included to ascertain those who were not residing in China. All responses not fitting into the constraints were removed from the analysis. This study also made use of communication means such as Wechat and QQ which are popularly used within China by Chinese and foreigners residing in China alike. Clear explanations and definitions of important terminology were provided at the very beginning and throughout the survey. Terms such as alternative, and traditional financing methods were shortly defined in brackets each time they appeared. Respondents could not use the same device to respond to the survey more than once. Finally, in order to motivate the respondents, red packet lottery games were done via Wechat for those who had successfully completed the survey. The survey was put into two forms. One for computer viewing, and the other for mobile phone viewing. The survey began with questions on demographics. These included age, gender, educational level, region in Africa, as well as their place and length of residence in China. Afterwards, the study inquired about the respondent's business ownership status, the type and structure of business started. For instance, we wanted to know if the respondents planned to start a merchandising, technology, or service business. We questioned them on whether they wished to start it as a partnership, or sole proprietorship. From this point, questions on their internet activity/ usage rate for online transactions while in Africa and in China were asked. Their level of online trust, knowledge of alternative financing methods, their preference for or against alternative financing methods, past usage rate and experience with it, alongside willingness to use alternative financing methods were asked. Finally, open questions were asked on to get their opinions about alternative and traditional financing methods.

### **2.2. Sample**

410 responses were received from the online survey sent out. 26.2% were female, while 73.8% were male. A majority at 80% of respondents were from West Africa, with 10.6% coming from East Africa. 51.9% of respondents knew about alternative financing methods while 48.1% did not know about it. In China, their internet activity was 67.5% daily while being just 7.7% back in Africa. 72.1% of the respondents have resided in China between 1 and 3 years. 82.7% of the respondents prefer to use traditional financing methods instead of alternative. Only 6.7% of respondents have used alternative financing methods before, while 62% of respondents are willing to try out alternative financing methods. Interestingly, up to 54.6% of respondents considered traditional financing methods reliable, while 69% considered alternative financing methods to be unreliable.

### 2.3. Estimation Approach

Detailed discussions and analyses will be done on the response frequencies. However, to analyze the relationship between the factors, Probit regression is used to ascertain preference for alternative financing methods based on residence length, internet activity, residence length, and business type. We assume the following regression formulas:

$$\ln \left[ \frac{p}{1-p} \right] = \beta_0 + \beta_1 RL + \beta_2 BT + \beta_3 IAC + \beta_4 IAA + \varepsilon \quad (1)$$

$$\ln \left[ \frac{p}{1-p} \right] = \beta_0 + \beta_1 RL + \beta_2 BT + \beta_3 IAC + \beta_4 IAA + \beta_5 OT + \varepsilon \quad (2)$$

where  $\frac{p}{1-p}$  represents the probability of preferring alternative financing divided by the probability of preferring traditional financing,  $RL$ ,  $BT$ ,  $IAC$ ,  $IAA$ , and  $OT$  are factors about residence length in China, Business type, internet activity in China, internet activity in Africa, and Online trust respectively.

### 3. EMPIRICAL RESULTS

To get the first look into the factors that affect preference for alternative financing methods among Africans residing in China, we first check the ratio of preference for alternative financing methods according to each independent variable in details. We consider the sum and mean for each response sorted in terms of preference for alternative financing methods as is shown in the table below.

*Table 1: Descriptive Statistics of Key Variables*

	<b>Total Observations</b>	<b>Alternative Financing Preferred</b>	<b>Traditional Financing Preferred</b>	<b>Alternative Finance Preference Ratio</b>
<b>Panel A: Residence length</b>				
<= 6 months	40	6	34	0.150
6 months to 1 yr	18	6	12	0.333
1-3 yrs	297	39	258	0.131
4-6 yrs	36	11	25	0.306
6-10 yrs	12	4	8	0.333
>10yrs	7	3	4	0.429
<b>Panel B: Online Trust</b>				
Strongly distrust	22	3	19	0.136
Distrust	38	12	26	0.316
Indifferent	254	23	231	0.091
Trust	67	20	47	0.299
Strongly Trust	29	11	18	0.379
<b>Panel C: Internet Activity in China</b>				
Monthly and more	60	6	54	0.100
Weekly	73	12	42	0.219
Daily	277	35	86	0.126
<b>Panel D: Internet Activity in Africa</b>				
Monthly and more	362	49	313	0.135
Weekly	19	5	14	0.263
Daily	29	11	8	0.579

From table 1, we observe in panel A that there is an upward trend in terms of preference and resident length in China. The longer the resident length, the higher the alternative financing preference rate. We see a somewhat similar pattern in terms of online trust. In panel B, the more the trust level, the higher the preference rate. For online activity in panels C and D, we see in the case of internet activity in China, that there seems to be a negative trend between the frequency of internet usage and preference for alternative financing methods. However, in panel D, we see a rising positive trend between internet usage frequency and preference for alternative financing methods.

### 3.1. Univariate regression of financing preference on the key factors

In order to prove hypotheses 1 right or wrong, we run a univariate logit regression model testing RL, IAA, IAC, and BT which represent Residence length in China, Internet activity in Africa, Internet activity in China, and Business Type to be started. As business type is a categorical variable, we divide it into BT-MD, BT-MF, BT-IT, BT-HB, and BT-Oth which refer to the following business types; Merchandising, Manufacturing, Information Technology and Communication, as well as Others respectively.

*Table 2: Logit regression results for the Hypotheses 1 and 2*

Preference	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
RL	<b>0.327</b>	0.153	2.15	<b>0.032</b>	0.028	0.626
IAA	<b>0.319</b>	0.082	3.89	<b>0.000</b>	0.158	0.479
IAC	<b>-0.294</b>	0.138	-2.14	<b>0.032</b>	-0.564	-0.024
BT-MD	<b>0.212</b>	0.521	0.41	<b>0.684</b>	-0.809	1.232
BT-MF	<b>1.732</b>	0.688	2.52	<b>0.012</b>	0.383	3.081
BT-ITC	<b>2.130</b>	0.568	3.75	<b>0.000</b>	1.015	3.245
BT-HB	<b>1.652</b>	0.579	2.85	<b>0.004</b>	0.517	2.787
BT-Oth	<b>0.859</b>	0.957	0.90	<b>0.369</b>	-1.017	2.737
Constant	<b>-2.567</b>	0.949	-3.04	<b>0.002</b>	-4.427	-0.706

In table 2 we observe that Residence length has a positively significant correlation to preference for alternative financing methods at a 3% level. In essence, the longer the residence length in China, the higher the preference for alternative financing methods by Africans in China. For Internet activity in Africa, we observe a highly positive and significant relationship between internet activity frequency and preference for alternative financing methods at a 0.0% level. It indicates therefore that the higher the frequency of a respondent's internet usage while in Africa, the higher their potential of preferring to use alternative financing methods for business startup. On the contrary we find a negative correlation between higher internet activity in China and preference for alternative financing methods at a 3% significance level. An explanation to this phenomenon upon further research was that in China, activities such as purchasing products, or phone and popular communication tools such as *WeChat*, or *QQ* require internet availability. Therefore, we realized that higher internet activity in China compared to Africa is not an indication of higher preference for alternative financing methods due to the fact that internet activity in China is mostly a day to day necessity, and is therefore not primarily used as a learning tool by the Africans in China. When we consider Business type as a categorical independent variable, we notice that as a whole business type is significantly positively correlated with preference. However, when we look in details we find that not all categories of business type are positively significantly correlated. We note that only those who intend to open Manufacturing, Information Technology, or Hybrid (mix of types) styles of business show this

strongly positive significant relationship with preference. Overall, we see that opening an IT and Hybrid show the higher positive level of significance at a 0% level. Seeing as majority of the alternative financing methods available for exploitation are online based platforms, we find Online trust to be a relevant factor where alternative financing methods are concerned. As such, we run a more detailed and stringent multivariate regression analysis using the former variables but now including online trust (OL) in terms of parentheses \*\*\*, \*\*, \* which indicate significance levels at 1%, 5%, and 10% respectively. This is represented in table 3.

*Table 3: Logit regression results for the Hypotheses 1 and 2*

Independent V	Preference					
RL	0.283*					0.302**
	(1.901)					(1.974)
IAC		-0.396***				-0.331**
		(-3.356)				(-2.354)
IAA			0.434***			0.318***
			(5.982)			(3.871)
OT				0.400**		0.287*
				(2.552)		(1.742)
BT					0.000	0.000
					(.)	(.)
BT-MD					-0.315	0.324
					(-0.644)	(0.613)
BT-MF					1.648***	1.926***
					(2.540)	(2.764)
BT-ITC					2.100***	2.115***
					(3.884)	(3.704)
BT-HB					1.743***	0.694***
					(3.139)	(2.915)
BT-Oth					0.847	0.916
					(0.930)	(0.951)
Constant	-2.456***	0.516	-2.639***	-2.879***	-2.100***	-3.291***
	(4.605)	(-0.256)	(-6.307)	(-5.398)	(-4.855)	(-3.161)
N	410	410	410	410	410	410

*Note: The t-statistics are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the levels of 1%, 5% and 10%, respectively.*

Table 3 shows similar results as table 2. However, in this case we only consider the significance levels of these variables with the dependent variable preference in this multivariate regression. What we find here is that similarly, Residence length remains positively significant but this time at a 10% level unlike before where it was significant at a 3% level. Similarly, we see that internet activity in Africa remains highly significant at a 1% level, and internet activity at a negative 1% level. We see that in terms of business type, Manufacturing, IT, and Hybrid businesses show the highest levels of significance all at the 1% level. When Online trust is introduced into this regression, we find that online trust is positively significant with preference at a 5% level. In essence, the higher the online trust, the higher the preference of alternative financing methods. Once more the above regression table shows that internet activity in Africa, residence length, business type, and now online trust are important factors that determine preference and adaptation to alternative financing methods.

### 3.2. Results and discussion

Before the analyses, we hypothesized two things. First that there exist significant effects of residence length, internet usage, and online trust on the respondent's preference for alternative financing methods, and second; that there exists significant effects on higher technology intensive startups and the respondent's preference for alternative financing methods.

Upon running the two multivariate regression formulas above, we find that hypotheses 1 and 2 are proven in tables 2 and 3. We find that indeed, residence length, internet usage in Africa, as well as online trust have significantly positive relationships with preference for alternative financing methods. However, for hypothesis 1 we find that internet Activity in Africa has a significantly negative relationship with preference. For hypotheses 2, we find that indeed, the more a business type is technology intensive at startup the higher the preference for alternative financing methods by Africans in China. We can therefore say that hypotheses 1 and 2 are fundamentally proven right, and our robustness tests let us accept these results as truly significant. When we look at the raw data and statistics, it appears that that traditional financing methods is more preferred overall by the Africans residing in China.

### 3.3. Robustness test

We ran the Jaque-Bera skewness-kurtosis test on all raw data in order to see that the regression models run were plausibly normally distributed. As this test looks into the properties of skewness in the raw data and also takes into account chi squared at 2 degrees of freedom, it is a suitable test for this study. After running it, we found that the joint analyses of adjusted chi squared and the P value of Chi squared produces a highly significant result with a P-value of 0.000 for all 410 observations. As our p-value is highly significant at 0.00%, we can conclude that we have enough evidence in this study with which to reject all null hypotheses of normality. Therefore, the relationships between variables found are in fact significantly relevant.

## 4. CONCLUSION AND RECOMMENDATIONS

As traditional financing methods such as bank loan attainment have become more difficult to attain especially for Africans, now more than ever alternative financing methods offer hopeful options. Alternative financing methods such as Peer to peer lending, Crowdfunding, and other online markets connect lenders to borrowers, and serve as a tool for startup financing. However, several key factors play a role in the adoption of alternative financing methods by Africans. In this study, we find that for Africans in China, several key factors affect their preference for alternative financing methods. We find that internet usage of the respondents while in Africa plays a role. We see a positive significant effect between higher internet usage while in Africa and preference for alternative financing methods while in China. We also find that higher online trust alongside longer residence length in China have significant positive effects on preference for alternative financing methods. Interestingly, preference is affected by the type of business to be started. Information Technology, and Manufacturing startups had highly positive significant effects with preference for alternative financing methods. Identifying the preference of Africans, especially those in diaspora is a key element to deciphering the factors affecting the poor state of alternative financing methods adoption. Future research can perhaps look at the state and usage rate of alternative financing methods in Africa, as well as the determinants to preference and the rate of adoption of alternative financing methods by Africans in Africa, and Africans across the globe.

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## ECONOMICAL AND ECOLOGICAL ASPECTS OF PRODUCT INNOVATION IN SUSTAINABLE MANUFACTURING PROCESSES IN WOODWORKING INDUSTRY

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### **ABSTRACT**

*New ways of processing sulphate liquors are therefore only geared to the use of some liquor components or to the production of high-priced products. The production technology of these products must be economically unattractive, technically easy to manage, and must be beneficial in solving environmental problems. Alkali lignins isolated from sulphate kraft liquors are polydisperse, three dimensional macromolecules derived from native lignin by hydrolysis in alkali and subsequent precipitation under acidic condition. Absence of free phenolic hydroxyls and low cross-linking degree make alkali lignins applicable as substitutes of phenol in phenol-formaldehyde (PF) polycondensates. In our research, we focused on studying the preparation of environmentally acceptable mixed polycondensation adhesives by applying reciprocal substitution of PF adhesives to unmodified sulphate liquors. These adhesive mixtures have been applied to the preparation of innovative wood composites with a perspective of sustainable manufacturing processes in the woodworking industry. In our analysis, we also focused on the assessment of selected economic and environmental aspects of sustainable technological processes in the production processes that generate innovative wood composites.*

**Keywords:** *Economy of product innovation, Sustainable manufacturing processes, Wood composites*

### **1. INTRODUCTION**

After the change in the economic system in 1989, the wood and furniture industry in Slovakia was faced with the need to restructure the production program with product innovation and the direction of exports to EU countries. In the 1990s, a number of important technologies were introduced in Slovakia to finalize coniferous and deciduous timber, such as e.g. glued frames for windows and for glued wood building constructions, single-layer and three-layer glued boards made of coniferous and deciduous timber. However, the production of large-area floor panels made of cut blanks and veneers has become crucial for the 21st century. Nowadays, in furniture production, the innovation was also focused on the application of glued boards in the cabinet living room furniture (National program of utilization of wood potential of the Slovak Republic, 2015). The space for the development of wood and furniture industry in Slovakia, which is marked by the long-term attenuation of mechanical and technological innovations, high exports of wood raw material and rough timber and other contexts, is wide. The most important intent in innovation is to achieve the highest level of qualitative wood appreciation with adequate job creation, thereby increasing the competitive capacity of the furniture industry in the domestic and foreign markets. At the same time, some technologies will be verified within the framework of its own development and the trend of product innovation will be monitored, which would enable the production of new products with high quality evaluation of wood raw material (Kajaks et al., 2012; Ružinská et al., 2014). Wood research is currently looking for other ways to increase the utility value of wood raw material and its more complex processing, e.g. production of composite materials. Increasing the efficiency of the use of wood raw materials must take place in a real ecological situation under conditions of reducing the



quality of raw materials, increasing the quality needs of the company and increasing the requirements for hygienic, especially ecological quality of products and technologies (Que and Furuno, 2007; Kajaks et al., 2012; Ružinská et al., 2018a). Bonding in the woodworking industry is becoming increasingly important as one of the methods of economically using wood. In addition, it makes a significant contribution to the increased recovery of woody material, in particular by the ability to process less valuable wood ranges and, in particular, industrial waste (Klašnja and Kopitović, 1992; Kordheili et al., 2016). Synthetic polycondensation resins are widely used as process adhesives in fiber, particulate, and laminate composites as well as structural bonding. In addition to the urea-formaldehyde adhesives, phenol-formaldehyde (PF) adhesives are also important in the wood industry. They are characterized by waterproofness, somewhat more favorable hygienic properties (lower release of formaldehyde and free phenol) compared to urea-formaldehyde adhesives (Danielson and Simonson, 1988; Wooten et al., 1988). The use of these adhesives is limited due to the higher cost of their preparation as well as their brown-red color (the glued joint remains brown-red even after curing). As a result of efforts to improve the environment, global developments in the field of adhesives have led to the development of new or purposeful adaptations of existing technologies with a focus on reducing formaldehyde emissions as product innovations (Duong, 2011; Roffael et al. 2012; Ružinská et al., 2018b). The suggested solution is to replace the toxic components in polycondensation adhesives with natural polyphenols, in particular technical lignins, which can be isolated in significant amounts as a secondary waste material from the pulp and paper industry. Although kraft black liquors are an important part of the energy and material balances of pulp mills, it is possible to divert approximately 10% of them to further chemical processing without compromising the technological balance of the production process (Lynch, 1987; Chen, 1997; Figueiredo et al., 2018; Ružinská et al., 2018a,b). Alkaline lignins are polydisperse, three-dimensional phenolic macromolecular substances that are obtained from native lignins by alkali treatment and acid precipitation. The absence of free phenol groups and the low degree of cross-linking makes it possible to use these lignins as an addition to the phenol formaldehyde polycondensates and thus to replace part of the phenolic component (Shimatani and Sano, 1995; Santana et al., 1996; Hatakeyama et al., 2010). The properties of alkaline lignins depend not only on the raw material from which they were obtained, but also on the whole process of delignification and isolation of lignin from liquors. Organic components of kraft black sulfate liquors are utilized in the regeneration process. They provide thermal energy and carbon to reduce sodium sulfate (Danielson and Simonson, 1988; Singh et al., 1994; Lora and Glasser, 2002; Ružinská et al., 2018a,b). Therefore, new processes for the processing of kraft black liquors focus only on the use of some liquor components or on the production of high price products. The technology of producing these products must be economically unpretentious, technically easy to manage, and must contribute to addressing environmental problems (Klašnja and Kopitović, 1992; Danielson and Simonson, 1988; Ružinská et al., 2018b). In our research, we have focused on the preparation of innovative adhesive mixtures where the original PF adhesive is reciprocally replaced by unmodified, original sulphate black liquors. These waste unmodified sulphate liquors, which are a component for the preparation of innovative adhesive mixtures, were subsequently applied in the preparation of composite wood materials. These innovative and sustainable wood composites are useful in both woodworking and furniture manufacturing as environmentally acceptable materials with higher added value and with significantly lower price ranges than comparable commercial products.

## **2. EXPERIMENTAL PART**

### **2.1. Material and methods**

In our research we focused on the proposal and preparation of innovative wood materials (composites) - plywood, which are prepared with the application of new adhesive mixtures.

Polycondensation adhesives (PF) are reciprocally replaced by the original unmodified kraft black liquors (sulphate) that are formed in the industrial manufacturing processes of the preparation of sulphate pulp in the pulp and paper industry as waste products. At present, these sulphate liquors are used only in energy, and their use for higher value added products is very low (Ružinská et al. 2014, 2018b). The chemical structure of kraft black sulphate liquors has suggested that they contain natural phenolic components which can react in the alkaline medium by the *LEDERER-MANAS REACTION* and incorporated into mixed lignin-phenol-formaldehyde polymeric compounds which may have adhesive effects. In our research we were determined selected characteristics of kraft black liquors and commercial phenol-formaldehyde adhesive to acquire the necessary knowledge to assess their mutual reactivity and compatibility in the prepared adhesive mixtures and also in their preparation of wood composite materials - plywood.

## **2.2. Laboratory preparation of the adhesive mixtures**

Adhesive mixtures to be applied in the preparation of three layer plywood were prepared with the gradual replacement of the original proportional fenolformaldehyde adhesive (PF) original kraft black liquors gradually from 10 to 40 % by weight. Adhesive mixtures were varied with the aim of proportional replacement of PF adhesive: 10, 20, 30, and 40% wt./wt. by origin kraft black liquors. As a reference, a series of three layers plywood was prepared with application of pure PF adhesive (PF + 0% by weight of origin kraft black liquors).

## **2.3. Laboratory preparation of wood composites - plywood**

Three layers plywood was prepared from the above glue mixtures under the following conditions:

- pressing time: 5.7 minute
- pressing temperature: 150 °C
- specific pressure: 1.8 MPa
- coating of adhesive mixture to veneer surface: 150 g.m<sup>-2</sup>
- moisture content of veneer: 5.01%
- Plywood composition: 1.8-1.8-1.8 (mm) beech veneer.

## **2.4. Evaluation of selected properties of laboratory prepared plywood**

In order to assess adhesion as the most important indicator of bond strength, we assessed the shear test for prepared plywood. After pressing, the plywood was conditioned for 14 days. The selected mechanical properties were evaluated:

- Shear strength of the plywood after the exposure test D4 according to EN 314-2.
- The exposure test D4 (EW100) of the glued bonds due to climatic conditions determined according to EN 314-2 and is intended for the use of glued bonds in the interior with frequent strong action of flowing or condensed water, respectively for outdoor applications with weathering effects.

This exposure test consists of the following test sample activities:

- 7 days air conditioning ( $\varphi = 65 \pm 5 \%$ ,  $T = 20 \pm 2 \text{ }^{\circ}\text{C}$ )
- 6 hours of cooking in boiling water
- followed by 2 hours of soaking in cold water
- 7 day air conditioning ( $\varphi = 65 \pm 5 \%$ ,  $T = 20 \pm 2 \text{ }^{\circ}\text{C}$ ).

## 2.5. Evaluation of ecological properties of prepared plywood

Evaluating the ecological properties of adhesive mixtures prepared with the original unmodified kraft black sulfate liquors, we have devoted our research to the results of our research (Ružinská et al., 2014, 2018b). In this paper we present the results of the evaluation of selected ecological characteristics: prepared glue mixtures:

- For prepared glue mixtures - evaluation of free phenol content by bromometric determination. The free phenol must be isolated from the adhesive by displacing the phenol with water vapor (according to specific analytical selective method).
- For laboratory prepared plywood - assessment of the released formaldehyde content by chamber method according to EN 717-1.

## 3. RESULTS AND DISCUSSION

In our research we have designed and prepared adhesive mixtures (5 variants) containing phenol-formaldehyde adhesive with gradual reciprocal substitution of PF adhesives unmodified with original sulphate extracts. This varied adhesive mixture was applied in the laboratory preparation of wood composite materials: three-layers plywood. In the evaluation of the efficiency and quality of bonded joints, they were subjected to evaluation of selected mechanical properties - shear strength of bonded joints according to EN 314-1. These mechanical properties as characteristics representing the most important strength properties of glued joints in prepared plywood were evaluated after the exposure test D4 (EW - 100). Average values of shear strengths of each variant of laboratory prepared plywood are shown in Table 1.

*Table 1: Shear strength of prepared plywood after the exposition test*

Series of samples	$x_s$ (MPa)	$s$ (MPa)	$v_k$ (%)	Composition of adhesive mixtures (wt./wt.)
1	3.2081	0.4341	13.532	PF + 0 % * <sup>R</sup>
2	3.2856	0.4020	12.236	PF + 10 % orig. liq.
3	2.8375	0.5383	18.971	PF + 20 % orig. liq.
4	2.8942	0.4412	15.247	PF + 30 % orig. liq.
5	2.1689	0.2791	12.868	PF + 40 % orig. liq.

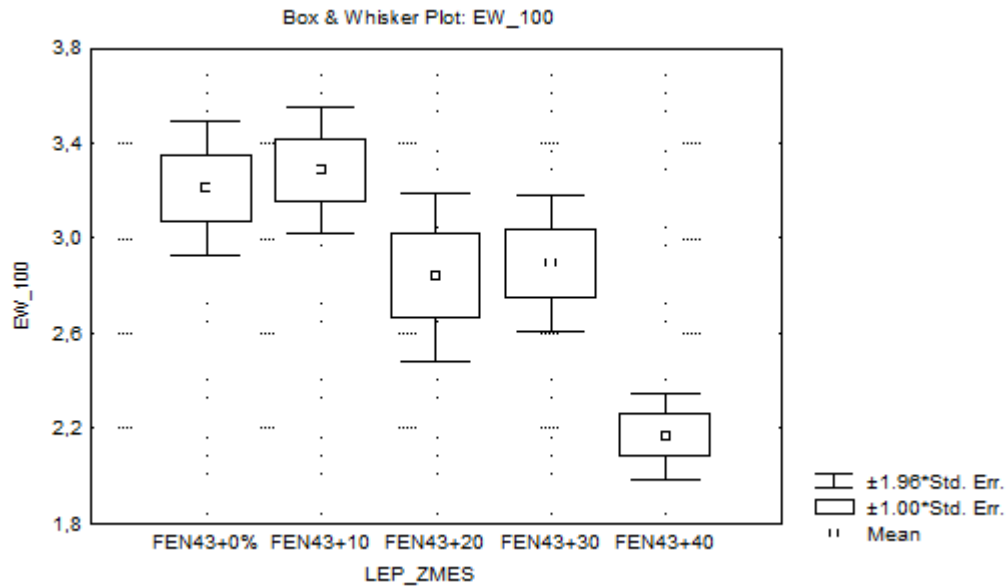
*Notes:  $x_s$  - average dry shear strength values of plywood,  $n$  - number of test samples in each series: 60,  $s$  - standard deviation,  $v_k$  - coefficient of variation, PF + 0% \*<sup>R</sup> - reference sample*

*Source: the author's own results*

In the STATISTICA program we measured the dry shear strength values of laboratory prepared plywood (Figure 1).

*Figure following on the next page*

Figure 1: Confidence intervals for mean values of shear strength of prepared plywood (MPa) after the exposure test D4 (EW 100)



LEP\_ZMES - Composition of adhesive mixtures (wt./wt.), EW\_100 - Shear strength of plywood (MPa) after the exposure test D4 (EW 100)

Source: the author's own results

Using a single-factor scattering analysis, we tested the statistical significance of the difference between the five mean values of the observed properties in the various variations of the adhesive mixtures (Table 2).

Table 2: Single-factor scattering analysis for the evaluation of the shear strength of the plywood after the exposure test D4 (EW-100)

Analysis of Variance D4(EW -100) – orig. liq.								
Marked effects are significant at $p < ,05000$								
	SS	df	MS	SS	df	MS		
	Effect	Effect	Effect	Error	Error	Error	F	p
D4	7.018249	4	1.754562	7.300648	40	0.182516	9.613187	<b>1.52 E<sup>-05</sup></b>

Notes: SS - the sums of squares of deviations due to factors, their interaction and random factors; df - degree of freedom (interaction of factors to dispersion of random factors); MS - scatter caused by factors, their interaction and random factors; F – F test; p - levels of significance of the F-test

D4 - Shear strength of plywood (MPa) after the exposure test D4 (EW 100)

Source: the author's own results

Probability of validity of the hypothesis about equivalence of mean values is  $p = 0.0000152$ . This means that the differences between the mean values are statistically very significant. Using the LSD test, we have evaluated in more detail which pairs of mean values differ statistically significantly from each other. In the Table 3 we can see LSD test for evaluation of shear strength of prepared plywood after the exposure test D4 (EW-100).

*Table 3: LSD test for evaluation of shear strength of the prepared plywood (MPa) after the exposure test D4 (EW-100)*

LSD Test; Variable: D4 (EW-100) – orig. liq.					
Marked differences are significant at $p < ,05000$					
	{1}	{2}	{3}	{4}	{5}
	M=3,2081	M=3,2857	M=2,8376	M=2,8942	M=2,1690
PF+0%* <sup>R</sup> {1}		0,702207	0,073186	0,126946	<b>7,11E-06</b>
PF+10 % orig. liq. {2}	0,702207		<b>0,031774</b>	0,058978	<b>2,06E-06</b>
PF+20 % orig. liq. {3}	0,073186	<b>0,031774</b>		0,779874	<b>0,001929</b>
PF+30 % orig. liq. {4}	0,126946	0,058978	0,779874		<b>0,000865</b>
PF+40 % orig. liq. {5}	<b>7,11E-06</b>	<b>2,06E-06</b>	<b>0,001929</b>	<b>0,000865</b>	

*Notes: M - average values of shear strength of plywood (MPa) after the exposure test D4 (EW-100)*

*Source: the author's own results*

Based on the evaluation of the average values of the shear strengths of laboratory-prepared plywood after the D4 exposure test (EW-100), we can say that a statistically very significant difference is between levels (1, 5); (2, 5); (4, 5). A statistically significant difference is between levels (3, 5). A statistically significant difference is between the scores (2, 3). At the limit of statistical significance is the difference in the mean values at the levels (2, 4); resp. (1, 3). The differences between mean values at levels (1, 2); (1, 4); (3, 4) were not statistically significant. From this mathematical and statistical evaluation of the mean values of the shear strength of the basic set (the shear strength of the plywood after the D4 exposure test (EW-100)) it is possible to recommend reciprocal replacement of the phenol-formaldehyde adhesive with original unmodified sulfate kraft black liquors up to 30% by weight. After evaluating the most important characteristic for strength and quality of bonded shear strength of plywood after the exposure test, it is clear that reciprocal replacement of problematic commercial PF adhesive up to 30% by weight can be achieved. Consequently, we were wondering how the ecological and hygienic characteristics of the proposed adhesive mixtures as well as the laboratory prepared plywood change. Using the bromometric analytical method, we evaluated the free phenol content of the prepared glue mixtures and we evaluated this ecological characteristic for commercial PF glue as well. The evaluation results for individual variants of adhesive compositions are shown in Table 4. The reference sample was a PF adhesive without the addition of additives, which had a free phenol content of 0.208 % by weight. According to recommended hygiene limits, PF adhesives can be considered non-toxic, where the free phenol content is less than 0.2% by weight.

*Table 4: Determination of free phenol in liquid PF adhesive mixtures*

Series of samples	Content of free phenol (% wt.)	Composition of adhesive mixtures (wt./wt.)
1	0.208	PF + 0 % * <sup>R</sup>
2	0.176	PF + 10 % orig. liq.
3	0.162	PF + 20 % orig. liq.
4	0.144	PF + 30 % orig. liq.
5	0.143	PF + 40 % orig. liq.

*Notes: PF + 0% \*<sup>R</sup> - reference sample, Source: the author's own results*

It is clear from the above results that the adhesive compositions prepared by us, which have been varied with the successive reciprocal replacement of PF with the original sulfate extracts, have shown a decrease in the free phenol content of the liquid resins.

This is an important finding because of the safe and environmentally acceptable handling of glue mixtures when applied to veneers in the process of preparing plywood. It is clear from our results that by replacing hygienically problematic PF adhesives currently in use, it is possible to prepare environmentally safer adhesives that have comparable qualities (in terms of the quality of glued bond s) as commercially produced plywood. In the case of finished experimentally prepared plywood, the free formaldehyde content by the chamber method was evaluated by the standard EN 717-1 method. The measured and evaluated emission results of pollutant - free formaldehyde are given in the Table 5 for the individual variant of the plywood. From the evaluated results (Table 5), it is clear that all the variants (2- 5) of the designed adhesive compositions used in the laboratory preparation of the plywood showed a reduction in free formaldehyde emission. The most significant reduction in formaldehyde emissions was observed for variant 4 and 5 with reciprocal substitution of PF adhesive by origin, unmodified kraft black liquors up to 30 % wt., resp. 40% wt.

*Table 5: Formaldehyde release from experimental prepared plywood determined by chamber method*

Series of samples	Content of free formaldehyde (mg.m <sup>-3</sup> )	Composition of adhesive mixtures (wt./wt.) in plywood
1	0.125	PF + 0 % * <sup>R</sup>
2	0.118	PF + 10 % orig. liq.
3	0.116	PF + 20 % orig. liq.
4	0.114	PF + 30 % orig. liq.
5	0.113	PF + 40 % orig. liq.

*Notes: PF + 0% \*<sup>R</sup> - reference sample, Source: the author's own results*

For comparison, we analyzed the free formaldehyde content as a hazardous pollutant from the reference variant, where only commercial PF glue was used in the preparation of plywood without the addition of sulphate extracts. The measured value of 0.125 mg.m<sup>-3</sup> slightly exceeded the established hygienic limit of 0.124 mg.m<sup>-3</sup>, which is considered to be the ceiling of environmentally acceptable glues glued using formaldehyde adhesives. It is clear from our results that the gradual reciprocal substitution of commercial PF adhesives contributes to the reduction of releases of released formaldehyde from finished wood products - plywood (composite materials), the most significant emission reduction of the pollutant was recorded already with 30% reciprocation of PF adhesive with original kraft black sulphate liquors. After the preparation and evaluation of adhesion in the prepared new adhesive mixtures, which were applied in the experimental preparation of innovative composite wood materials, the hygienic and ecological characteristics of these products were subsequently evaluated. From previous evaluations of individual characteristics: (shear strengths of wood composites in the context of their adhesion), further environmental attributes (modification of hygienic and ecological properties - reduction of pollutant emissions) showed that the proposed and prepared innovative products appear to be perspective by replacing the components of the original commercially produced plywood with waste sulphate unmodified kraft black liquors. In our research we also dealt with the specification of all relevant economic costs associated with the preparation of individual variants of glue mixtures that were applied in the preparation of innovative wood composites. Table 6 shows the average prices of designed and prepared adhesive mixtures that have been applied in the experimental preparation of wood composites - plywood.

*Table following on the next page*

*Table 6: Economic evaluation of average prices of adhesive mixtures for experimental preparation of plywood*

Series of samples	Price of adhesive mixtures (€/1 ton)	Composition of adhesive mixtures (wt./wt.) in plywood
1	528.60	PF + 0 % * <sup>R</sup>
2	484.53	PF + 10 % orig. liq.
3	431.41	PF + 20 % orig. liq.
4	373.67	PF + 30 % orig. liq.
5	332.12	PF + 40 % orig. liq.

*Notes: PF + 0% \*<sup>R</sup> - reference sample, Source: the author's own results*

Taking into account the price of the individual variants of the proposed and prepared adhesive mixtures, we started from the base - reference price of commercial PF adhesive. The prices of the individual variants of the glue mixtures prepared with the reciprocal replacement of the PF glue with the unmodified kraft black liquor also included the logistics and handling costs of the distribution of these waste components. In addition to the above-mentioned price, the costs that had to be spent on mechanical treatment (mixing and homogenizing of individual variants of adhesive mixtures), which were subsequently used in the preparation of innovative wood composites (plywood), were added. From the above mentioned price ranges it is clear that there was a significant economic saving when using glue mixtures with a reciprocal replacement of the original PF adhesive with unmodified black sulfate liquor, even at 30% substitution, which was evaluated as an optimal variant in terms of mechanical, hygienic and environmental characteristics. When calculating the price relations of individual adhesive mixtures for industrial use, it is necessary to consider, in addition to costs (logistics, handling), also technico-technological and application costs, which are related to the selection of suitable coating technology for the most effective application of adhesives to the surface of wood materials.

#### 4. CONSLUSION

In our research, we have focused on the preparation of innovative adhesive mixtures where the original PF adhesive is reciprocally replaced by unmodified, original sulphate black liquors. These waste unmodified kraft black sulphate liquors, which are a component for the preparation of innovative adhesive mixtures, were subsequently applied in the preparation of sustainable composite wood materials, usable in the wood-processing industry as products with higher added value, with efficient recovery of industrial waste and with acceptable ecological-hygienic characteristics. From this mathematical and statistical evaluation of the mean values of the shear strength of the basic set (the shear strength of the plywood after the D4 exposure test (EW-100)) it is possible to recommend reciprocal replacement of the phenol-formaldehyde adhesive with original unmodified sulfate kraft black liquors up to 30% by weight. From the results mentioned in the experimental part of the paper, it is clear that substitution of PF commercial adhesive by original unmodified waste sulphate liquors is a suitable variant to reduce the emissions of a toxic pollutant such as formaldehyde. It is clear from our results that by replacing hygienically problematic PF adhesives currently in use, it is possible to prepare environmentally acceptable adhesives that have comparable qualities (in terms of the quality of glued bonds) as commercially produced plywood. At present, efforts to develop innovative technologies in production processes need to focus on the preparation of environmentally acceptable materials with regard to human health, workers in production and also for the preservation of the environment.

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# INSTITUTIONALIZING SOCIAL ENTREPRENEURSHIP: A PATH TO HOLISTIC SUSTAINABILITY

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## **ABSTRACT**

*Social enterprises are organizations that try to reconcile the often competitive economic and social missions, by developing hybrid projects that produce both economic and social value. Nonetheless, the sustainability of those initiatives seems often at stake, due to market pressures. As a result, social enterprises often have to undermine their social mission goals, in order to achieve an economic sustainability. The present paper will try to explore how social enterprises can remain economically sustainable, without losing track of their social mission. The in-depth research of an Austrian social enterprise, i.e. OTELO, and of its regional institutional framework (NUTS3 region of Mühviertel), reveals the need of an institutionalization of this new form of entrepreneurship. In order to achieve a holistic sustainability, social entrepreneurship has to become institutionalized. Potentialities of this process will be investigated.*

**Keywords:** *Holistic Sustainability, Institutional Entrepreneurship, OTELO, Social Entrepreneurship*

## **1. INTRODUCTION**

Social entrepreneurship has received greater recognition during the last years both from institutions and scholars (Stryjan, 2006; Weerawardena and Sullivan Mort, 2006; Nicholls, 2008). This interest has enhanced since the recent global economic crisis, which enacted a broad discontentment with the global economic system (European Commission, 2014) and has renewed interest in the possibility of an alternative economy with a social perspective (Hadjimichalis and Hudson, 2007). Social enterprises are organizations that attempt to reconcile the often antagonistic private and public sectors, by giving birth to hybrid projects (Johnson, 2000) that combine the creation of both economic and social value (Alter, 2004). The permeability of the traditional boundaries has never been an easy task, since as the old forms are dying and the new ones are trying to be born, crises often emerge. Especially when the withdrawal of public funds increases the pressures for diversifying the income sources (Defourney and Nyssens, 2010), social ventures turn more and more to commercial activities to achieve economic sustainability (Chell, 2007). Whether social enterprises achieve a new balance between social and economic sustainability, or the omnipotent market pressures eventually blunt the social edges even further, remains controversial. The present paper critically engages to the question of how social enterprises can achieve an economic sustainability without losing track of their social purpose. More specifically, it investigates how social entrepreneurship can build a social and institutional consensus and eventually achieve a holistic sustainability. Our research makes a twofold contribution. Primarily, it explores the potentialities of sustainability for institutional entrepreneurship. At the same time, it contributes to one of the major deficient of new institutionalism, namely that of interpreting institutional change. In the present research, thus we try to illustrate potentialities of institutional change via the emergence of new organizational forms.

The relationship between institutional entrepreneurship and institutional change seems bidirectional and has been investigated as such. In the second part of the paper, we investigate the theoretical context of social entrepreneurship, and more specifically the complex but also nuanced dynamics that are developed between its economic and social dimensions. The research question of how social entrepreneurship can achieve a holistic sustainability is addressed, with reference to the concept of institutional entrepreneurship. In the third part of the paper an in-depth qualitative research of the Austrian social enterprise of OTELO is presented, as well as of the surrounding institutional framework of the NUTS3 region Mühlviertel. The research has developed a political narrative of the region of Mühlviertel that tries to illustrate the institutionalization of the organizational form of OTELO across the region, with reference to the three basic dimensions of the process: appropriateness, politics, and discourse. The embeddedness of the organizational form of OTELO in all three levels has constituted a major factor of its sustainability, as well as of the change of the political institutions per se.

## **2. THEORETICAL CONTEXT**

### **2.1. Social Entrepreneurship**

Still from 1990s, there has been an extended literature, which expresses concerns about the trend of commercialization of social enterprises (Teasdale, 2010; Curtis, 2008; MacDonald, 2012; Maier and Schneider, 2012). Applying resilience theory, Dennis and Choony (2015) stress the possibility that inside a very competitive market environment such organizations may be drifted away from their original balance between the social and the commercial perspectives; their new balance is often ambivalent. The strategy of commercialization often has to sacrifice the social mission goals, in order to gain success and economic sustainability (Weisbrod, 1998). The most basic reason for the acquired commercial activity is the imperative need for survival and economic sustainability, reflected to the social entrepreneurs' constant needs and agonies. One of the most extensive researches of the field, by questioning a sample of ninety-three self-designating social enterprise leaders reveals an overarching, commercially focused growth orientation for the sustainability of the enterprises (Jenner, 2016). This is the outcome of a commercial pragmatism reflected to the quote that "if it does not work financially, it does not work socially" (Jenner, 2016). Due to the difficulties of addressing both a social and an economic sustainability (Russell and Scott, 2007), social entrepreneurs often identify commercial outcomes as the primary driver for sustainability of their ventures (Jenner, 2016). Applying market solutions to the provision of social services presumably increases efficiency, reduces costs and raises the work ethic (Garrow and Hasenfeld, 2014). This enhanced focus to the entrepreneurial practices of social enterprises (Diochon and Anderson, 2009) cannot be ignored. The wide application of a strict economic rationality has many interpretations, ranging from being an alibi for an application of a neoliberal agenda (Teasdale, 2012; MacDonald, 2012; Maier and Schneider, 2012), to even an unconscious application of the market strategies that have prevailed (Shaw, 2004). In any case, the balance between the economic and the social perspectives seems hazardous. A seemingly reasonable critique would be that it is better to provide limited services, than sticking to an economically unsustainable model that in the end would result to no services at all. Such an argument ignores the fact that social sustainability is not only merely an ethical vision but a fortiori an economically sustainable endeavor of development (Daly, 2007; Neumayer, 2004). The strong interrelation between sustainable development and social entrepreneurship has been widely researched (Popescu et al, 2016; Hudon and Huybrechts, 2017; Munoz et al, 2015). What remains less investigated is how this sustainability is enacted, or in other words, what are the processes through which social enterprises become sustainable without undermining their social goal. To address this question we have focused our analytical attention to organizational theory and more specifically, to the

embeddedness of new social enterprise organizations to the socio-political framework via a process of institutionalization, namely what DiMaggio introduced as institutional entrepreneurship (DiMaggio, 1983).

## **2.2. Institutional Entrepreneurship**

DiMaggio (1983) coming from an organizational theory perspective has first introduced the concept of institutional entrepreneurship. The term refers to the practices of agents “who have an interest in particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones” (Maguire et al, 2004). Institutional entrepreneurs create thus “a whole new system of meanings that ties the functioning of disparate sets of institutions together” (Garud et al, 2002). The development of organizational forms seems to be one of the main drivers of institutional change that has only recently gained the attention of institutional theorists. What all perspectives of institutionalism have hitherto considered as uncontroversial is the embeddedness of institutions to society and economy (Peters, 2012). Institutions are systems of meanings, discourses and symbols and cannot but remain grafted onto their social context. The population ecology model of organizations (Hannan and Freeman, 1989; Singh, 1990) when applied to political science emphasizes exactly this interdependence (Cassstevens, 1984; Peters and Hogwood, 1988). The basic principle of the applied population ecology model is that the environment of organization is similar to the biological environment and as such, it gives a very specific and limited spectrum of opportunities for structures to survive (Peters, 2012). Furthermore, it gives specific conditions of survival that render institutions resistant to change (Strang and Sine, 2002). Institutionalism becomes thus more eligible in interpreting institutional continuity and reproduction, rather than change and transformation (Peters, 2012). This is one of the main arguments against institutionalism, namely that by placing so much emphasis on convergence (Powell and DiMaggio, 1991), autonomous decision making has been completely undermined and removed from the picture (Dowding, 1994). A tendency to anthropomorphize norms and ideas, allowing them to interact directly without the mediation of actors, has been a mainstream element of institutionalism (Jenson and Mérand, 2010). Such an account leads to a major deficient, namely that if institutions can be empirically proven as not so stable and continuous then new institutionalism’s potential for explaining preference formation, discursive practices, and strategic action is sufficiently weakened (Harty, 2005). By introducing this critical strand, DiMaggio (1983) shifted the analytical focus on the emergence of new organizational forms and the institutional change that they could enact. This perspective approaches organizational forms as the manifestation of institutional logics (Greenwood et al, 2010). Thus, an introduction of a new organization form could influence or even drastically change the institutional logic that underpins it. The dynamics between institutions and organizational forms appear nuanced and bidirectional. Organizational forms are created through a process of bridging institutional entrepreneurship, in which an institutional entrepreneur creates new hybrid logics that underpin new organizational forms, by combining aspects of established institutional logics. In other words, actors try to manipulate the institutional structures in which they find themselves embedded (Garud et al 2002). In our field research, we attempt to trace the emergence of a new organizational form underpinned by a new institutional logic. The actions of the rather well embedded OTELO social enterprise has been investigated with reference to the three theoretical dimensions of institutional entrepreneurship as summarized by Tracey et al (2011):

- Legitimacy and appropriateness of the actions of the agents within a system of norms, values, beliefs and definitions.
- The political dimension of institutional entrepreneurship where power contests unravel between the participants

- A discourse dimension, to create systems of meaning through the strategic use of symbols and language.

Field observations have confirmed the significance of all three dimensions in the institutionalization of the organization and will be further analysed.

### **3. OTELO: INTRODUCING INSTITUTIONAL ENTREPRENEURSHIP TO THE REGION OF MÜHLVIERTEL**

#### **3.1. Research Design**

The OTELO project started as a network of open technology laboratories. OTELOs essentially provide “open spaces” and “open technology labs” to create inspirational environments for innovation to flourish and to attract young and innovative people to live in rural areas. The concepts of innovation and openness lie on the core of the OTELO project and have gradually developed a “network for innovation culture” (Monetz, 2018). The economic success of OTELO is reflected to its broad expansion across Austria but also to a constantly growing international network. Founded in 2010, OTELO has already opened 10 locations throughout Austria, and is spreading internationally with two German and one Spanish OTELOs currently in the start-up stage. In addition, within one year OTELO developed 17 collaboration projects with industry partners and NGOs and hosted more than 150 events on regional innovations, involving more than 20.000 people in these activities. The sustainability of the project is in any case one of the main criterion of its success as the continuity of the project is assessed as rather crucial (Derma, 2018). The NUTS3 region of Mühlviertel constitutes the institutional framework inside which OTELO has been investigated. The reason for that is the strong historical and contextual bondages between OTELO and some of the LEADER regions of Mühlviertel, which render the process of institutionalization clearly identifiable. The region of Mühlviertel consists of six LEADER regions: Perg Strudengau, Mühlvierter Alm, Mühlvierter Kernland, Sterngartl-Gusental, Donau- Böhmerwald, Urfahr-Umgebung<sup>1</sup>. Mühlviertel is a prosperous statistical region that is constantly growing in economic terms. The GDP adjusted by current market prices constantly rises from 2007 at 3.896 to 5.279 million euros at 2015, i.e. a growth of 74% during an eight years period. At the same time the population remains moderately stable, 204 thousand people at 2007, 206 thousand people at 2015. We are thus, overall talking about a prosperous region. The in-depth qualitative research presupposed a triangulation of data. The institutionalization of entrepreneurship was systematically compiled with resource to three sources: field data, documents, and qualitative interviews that were conducted in the research region. The method that has been used for data analysis was Grounded Theory. The controversial nature of politics, rendered the selection of the research subjects quite challenging. The prerequisites of the interviewees could be synopsized as following:

- In which political level is social entrepreneurship facilitated and who has the actual policy making power. Especially, for countries like Austria, which had the 14<sup>th</sup> most decentralized political structure among OECD countries (OECD, 2016), with multiple political levels of intervention, this is a factor that should be taken into serious consideration.
- Interviewees should be as least biased as possible. This parameter might exclude politicians a priori, since their political identity seems to heavily influence their responses, their general stance as well as the terminology that they use, towards the researched topics.

Drawing from field observations of the Mühlviertel region, the role of the Regional Development Offices (RDOs) was constantly exalted. While working with social enterprises of the field, talking to locals and policy makers of all levels the term social entrepreneurship came

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<sup>1</sup> For more see <https://www.leader.at/ueberblick.html>

usually with reference to the RDOs and the LEADER processes. Indicatively, managers of regional offices have often been found involved to the OTELO social enterprise network (Torning, 2018), as well as to other social economy ventures. Eventually seven semi-structured interviews have been conducted with the seven managers of the RDOs (NUTS3 and the six LEADER regions). The results of those interviews were compiled with reference to field observations of the OTELO network during a two-month internship, as well as with two in-depth, semi-structured interviews with two of the founders and main stakeholders of OTELO. All the interviews have been anonymized for reasons of political sensitivity.

### **3.2. An appropriate initiative**

The idea of OTELO did not emerge unexpectedly. On the contrary, it was a rather grounded project that was developed by regional development stakeholders in order to address the deficient of the hitherto regional development process. More specifically, the idea began in 2009 from Monetz, a then director of regional management for the Upper Austria districts of Vöcklabruck and Gmunden, and was the outcome of a critical stance towards the regional development strategies of all political levels, European, Federal Austrian and Upper Austrian. The gradual centralization of processes as well as the alienation of the civic society from the policy-making were the main reasons behind the OTELO project. Derma, a project manager and one of the first founders of OTELO stresses that OTELO has been itself initially financed by the LEADER in a schema where the two “played very well together”. Nowadays there is a process of further centralization, by moving the decision making of projects in Linz, and “taking out the energy of the regional process” (Derma, 2018). The intimacy and the connection between OTELO and LEADER has developed around the axis of experimentation. LEADER as well as OTELO “is like experimenting, prototyping and if you produce a prototype that is not working sometimes it is ok”. Now the regulations and the bureaucracy are constantly growing, dictated by the European tendency of mainstreaming enhanced by the Austrian common perception that “it has to work, otherwise you don’t get the money”. A very open project where you do not know exactly what will happen at the end is really difficult to get LEADER money. However, if you say, “I am designing something which at the end displays a space and a hard structure” you can get funding much easier. This led many people to retreat from LEADER projects since it is too time-consuming, too complicated and you have to know everything in every detail before you start (Derma, 2018). Eventually, two institutional logics that were supplementary and were combined efficiently soon became complementary, with OTELO being the appropriate new institutional logic to substitute basic elements of the community-led regional development of the LEADER. It seems that the OTELO project came to fill the void that the 2007-2013 LEADER mainstreaming period left behind, in terms of public participation, innovation and openness. The community building process that was facilitated mainly through the LEADER projects seems to have been undermined, and the founders of OTELO wanted to develop a culture of openness, sharing and cooperation that could generate innovative ways of participatory regional development. Finally, by using the traditional materials of community building and enriching them with technological initiatives, the OTELO has established a way of “doing something completely new in their system” (Derma, 2018). In other words, it managed to manipulate the structure in which it found itself embedded (Garud et al 2002).

### **3.3. A political predominance**

Engaging to the political dimension of the institutional entrepreneurship, the question that essentially emerges is how political debates between the traditional institutional logics and OTELO unravel. What raises as a common pattern from the interviews of our research is that political debates are often non-existent.

The reason for that is that among the perceptions of the institutional members, there is a common sense that OTELO has entrenched its own socio-political field of action and remains somehow autonomous from the mainstream institutional projects. Even if the supply of open spaces is often conceived as a less important action, in contrast to the basic infrastructure of the public sector (Korfer, 2018), these open spaces are considered substantial for young people “to work in a community and in an open way, to have meeting places where they could be together, work in a creative way” (Korfer, 2018). The dichotomy between political institutions and OTELO appears at times clear-cut and rather fundamental, as “a difference between serving communal and personal needs respectively” (Torning, 2018). The topic of developing open spaces to promote one’s own interests is considered to be (and usually is) independent from political institutions and public funding (Torning, 2018). When this is not possible and this autonomy is somehow violated, institutional agents become overcritical about OTELOs’ “dependence on public funding” and their “loss of impulse for innovation” (Dies, 2018). Even in this case, though OTELO actions are described by institutional agents rather eloquently as “a moment of happiness that certain things come together” (Dies, 2018). Especially, when there is a broad acceptance of the fact that the public sector cannot provide the services that OTELO provides (Korfer, 2018; Turning, 2018; Dies, 2018), the autonomy of its field of action is highlighted. An inadequacy of the public sector that seems rather ad hoc, since there were no convincing arguments of why these open spaces could not be provided by mainstream political institutions. The correlation between innovative, open spaces and social entrepreneurship appears as the political predominance of the new institutional logic that OTELO has introduced. It could be argued, that this has been the outcome of a bounded rationality of the institutional actors, namely an identification of their interests with this predominance. More specifically, when actors realize that the consequences of alternatives are promoting their own self-interest then change is possible (Peters, 2012). The intense dynamics between actor’s preferences and institutions have been broadly emphasized (Pierson and Skocpol, 2002,) Although the notion of self-interest has been criticized for being constantly imputed to motivations, nonetheless, when the self-interest is identified with the alternative policy, then actors do tend to act strategically to promote change (Peters, 2012). In the case of the Mühlviertel region, restricted by a time-consuming bureaucracy (Maill, 2018; Grubinger, 2018), traditional institutions seem to have conveniently retreated from the field of action of OTELO. In other words, in the OTELO actions, political institutions might have not only found a complement but a fortiori an alibi of their absence.

### **3.4. An open-space discourse**

After a process of embeddedness to the regional structures and institutions and a predominance in the political debates in the fields of action, the last step of the institutionalization of the new organizational forms is a dissemination of the discourse, namely an institutionalization of the discourse itself. A discourse dissemination reveals exactly the high level of embeddedness and the fact that the new institutional logic has gradually become a common perception across the regional field. Arising out of the mainstream regional development process, the OTELO discourse is closely interlinked with the regional development discourse, with terms such as community building, experimentation and innovation characterizing both the traditional and the newborn agendas. Nonetheless, a further element that seems to have been introduced by the OTELO agenda, at least in its present density, is the notion of open spaces, or more broadly openness (Derma, 2018; Monetz, 2018). The influences of the OTELO terminology to the institutional discourse becomes apparent from the fact that the closer you get to the core of the OTELO initiatives, the more embedded the OTELO terminology becomes. Spatially identified, the institutions of the LEADER regions of Mühlviertler Alm and Mühlviertler Kernland due to their spatial and historical intimacy to OTELO seem to have explicitly adopted a discourse of

openness and open spaces. Especially for Mühlvierter Alm, where one of the founders of the OTELO has been a key actor to the regional development of the region (Derma, 2018) this is immediately noticeably. Identifying the basics of the region as “openness, future thinking and acting, heart building, curiosity, bravery and optimism” the interrelation of those basics to the new organizational form is highlighted, since it is these basics that “make projects like OTELO possible” (Griwern, 2018). This open space ethic has been grounded for years on the municipal level with former mayors perceiving of innovation as exactly those “open spaces that allow people to try things” (Korbe, 2018). In cases, not only the discourse but also the idea of open spaces has been adopted in the municipal level (Korbe, 2018), by facilitating public open spaces. The fact that there have been public, municipal open spaces confirms for once more the ad hoc predominance of social entrepreneurship in the field. The lack of open spaces is now commonly conceived as a major deficient (Torning, 2018), reflected also to the fact that the manager of the LAG is one of the key actors in recently establishing the OTELO Mühlvierter Alm (Torning, 2018). Even when moving away from the established open environment of OTELO, the open space discourse is used to describe organizations, such as Youth Culture Centers (Grubinger, 2018). The open space ethic is considered as important for the population to be able to participate and do things that are done neither by the business nor by the public (Grubinger, 2018). Moving even to the higher political level of NUTS3, where there is an adequate distance of the institutions from the local open spaces, institutional members often refer to open spaces and their future important role (Wernberg, 2018) as meeting, non-consuming places, where people just meet or do workshops (Grubinger, 2018). The open spaces discourse seems to have been gradually embedded to the mainstream political institutions, rendering the new terminology a common perception across the regional framework.

#### 4. CONSLUSION

Social enterprises are initiatives that are balancing between their economic and social mission goals. In virtue of an economic sustainability, they often seem to lose track of their social dimension. The sustainability of both dimensions often (but not explicitly) comes through the institutionalization of the new organizational form that they introduce. This phenomenon was initially theorized by DiMaggio (1983) as institutional entrepreneurship, i.e a process in which the social entrepreneur manipulates the institutional materials to eventually install the new institutional logic that underpins the organization and ipso facto to change the institution itself. The research case of OTELO reveals exactly the importance of this process for the economic and social sustainability of the enterprise, in the three basic dimensions of institutionalization: appropriateness, politics, discourse. It might be objected, that for the social entrepreneurship structures, that are inextricably interwoven with the particular social contexts (Bacq and Janssen, 2011), generalizations seem arbitrary. Unequivocally, the path to the institutionalization of social entrepreneurship appears rather subjective. Nonetheless, displaying examples and potentialities of this process is a major precursor for the further applied research that has to be done.

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## **BIG FINANCIAL CRISIS: ANALYSIS, ASSESSMENT, PERSPECTIVES**

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### **ABSTRACT**

*In the work we aimed to present on the basis of 2008 big financial crisis, main tendencies of development and reformation of financial system in the modern world. So that we looked through and analyzed once again financial crisis, causes of the crisis, system of fundamental diagnostics. The work highlights the crisis lessons, fast liquidation of its negative results, necessary reformation of financial system entirely and main problems of financial regulation. On the background of reformation of the changes of the world architecture of financial markets we tried to show what negative role was played by fast wide transformation in the frame of economic reforms and decay of the state regulating role in the process of economic and financial reforms.*

**Keywords:** *financial crisis, financial regulation, Act of Dodd-Frank, financial intermediaries, nonfinancial companies, hedge-fund, globalization risks, reform of financial system*

### **1. INTRODUCTION**

It has passed ten years since 2008 great financial crisis, as we call it. So, we came up with an idea to present its cause - effect aspects. In the work we tried to highlight main problems: how to avoid financial crisis, to find ways to overcome it effectively and fast liquidation of its negative results. Herewith, realization of financial reforms in the country is a vivid point. It should be mentioned that high level of non-stability of outer financial environment factors condition intensive researches of the mentioned sphere. Anti-crisis financial management and in general theoretical basis of financial reforms are not completely formed yet in some ways (even mostly) is opposed in some authors' publications. In that period a lot of scientist-financiers worked on the essence of the financial crisis, causes of the crisis, its classification, fundamental diagnostic system of financial crisis, elaboration of anti-crisis management to escape from financial crisis and emergency steps and crisis lessons (Adrian T., Shin H., 2008). And yet, concretely, what is the main virus which caused the syndrome of immune- deficiency and destroyed the whole economic organism and its life-giving financial system, - It is possible to show only some aspects of it and with diagnostics of partially revealed symptoms. According to which causes and effects of the problem we will connect and discuss in relatively wide point, other aspects and reasons accordingly will be presented in a narrow point, i.e. we can't restore completely cause-effect reality. So far a human' mind finds it difficult to imagine complex space with more than three measurements, which is common and implemented in evaluating risk and computerized models and symptoms of management. Financial managers', as people's inappropriate level of non-even trust to hardly completed cybernetic products and , mostly, virtual illusions of newly-born postindustrial economics of scientific- technological revolution, simulative computerized models of financial or other risks portfolio management completely changed the recognition of reality , relation towards risk, future imaginations and became main

provocative factors in non-natural directions in financial relations and size-proportion way. It's rather difficult to define whether financial crisis fermented on the whole economics first or general economic problems sacrificed functioning of billions of securities. The direction of this vector of these dependences are presented accordingly what kind of problems we discuss, or the direction of this vector changes in dynamics of crisis development. It seemed that banking-credit organizations had less credit rating and liquidity problems before revealing crisis not because credit risks were not increased but because these risks were simply taken into off-balance accountants. The reason is evident - increased risk coefficients not to be used for regulative enquiries according to risks for calculating measured activities. Instead of hiding risks and debitorial debts for attracting liquidated money flows, usage of securitization and credit derivatives appeared to be quite effective, and regulators' reaction - too late and weak.

## **2. MAIN PART**

### **2.1. What Caused the Reformation Financial System?**

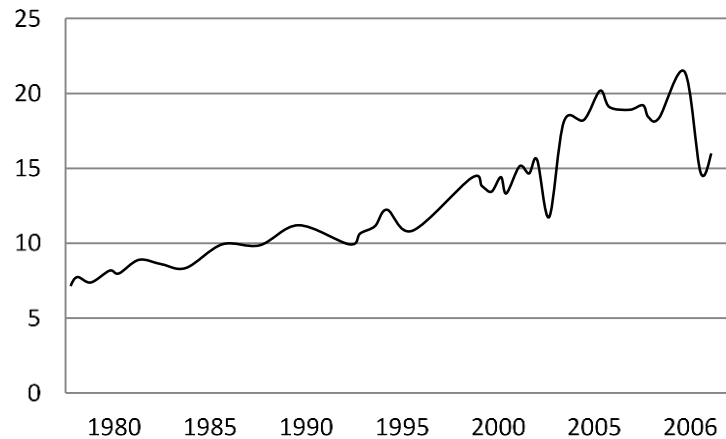
After the crisis of 2008, it became evident, that reasons for financial crisis were caused not only by economic factors, but also, by the shortcomings characterising the system of financial regulation. Created system of financial regulation after 1980, in the era of Great Modernization, conditioned development of financial investment, sharp growth of the market of derivatives, mitigation of financial regulation, extension of possibilities for free cross-border movement of capital, which gave rise to the financial and commodity assets. Active boom at the financial market was adequate to the created economic models. The system of financial regulation conditioned liberalization of financial markets, allowing maximum decreasing of price of borrowing for corporations, using preemption of globalization. This allowed provision of high rates of growth of global economy (in 2007, global GDP was increased mostly during last 30 years). However, this system had shortcomings as well, which gave rise to the passed crisis, which is related with the growth of risks in the financial system, insufficient amount of regulation of multiple sectors of financial market, increasing the meaning of "Financial Economy". Concentration of the risks in financial system and insufficient control from the side of regulator and the participants of the market, the problems of management arbitration gave rise to the strengthening of negative trends at the equity market. Of course, we cannot assign all reasons for global economic crisis exclusively to the rules of state regulation. However, at the same time, it's clear that completed crisis showed necessity of essentiality of upgrading all systems of financial regulation. Herewith, it is evident that the reform of financial regulation, which has already began in USA (Act of Dodd-Frank), upcoming changes in the system of bank regulation (Basel-III), the reform of global financial institutes speak not of the cosmetic changes in essential system of financial regulation, but also – about global changes. Global nature of changes allows us compare these reforms with the one of regulation of financial system, which took place in USA in 30s of the 20<sup>th</sup> century, and the reforms of 80s, which became the beginning of the era of Great Modernization. Herewith, we shall understand which changes in the financial system of the last 20 years gave rise to the necessity of financial reform. It is evident that not all offers set today, will be adopted. Many normative acts, completing the procedure of adoption, will require law enforcement practice, which is absent today. This will give rise to the fact that part of such offers appears insolvent or they will be essentially changed in course of their adoption. We cannot underestimate lobbying opportunities. For example, legislative force of Wall-Street in the congress is recognized by multiple experts to be much more serious than the opportunities of Main-Street. It's clear that current reforms will support taking populist decisions by the politicians in the fighting for political rating. It is quite simple to blame "Fat Cats" – the financiers in everything, to declare secure war against them, request deduction of their bonuses and premium and obtain additional voice of electorate. However, the offers related with the reform of the architecture of global financial system will give rise to

the contradiction from the side of “Current Mountain Kings” not being interested in the fundamental changes of existed system. Due to this, carrying out such measures will give rise to the political will (not at the national level – as any reforms are characterised with “public love”, the events in France related with the adoption of pension reform shows this clearly – so at the global level). We may recall, how long the emerging countries requested increasing of own representativeness in the Global monetary Fund and how titanic attempts will be requested for creation of the total global organ, coordinating activity of national regulators for the purpose of preventing situation, which took place in 2008. Due to this, we shall clearly understand that everything said regarding the reform of financial sector in many ways is of recommendation nature. Future of these reforms is not determined. However, they will take place. Moreover, another issue is the one about economic price of such reforms. As we have already noted before, the era of Great Modernization gave rise only to the crisis of 2008, misbalance in the global financial system. It gave rise to significant economic growth, in many ways explained by the high level of liquidity in the global financial system, low levels of exchange rates, in relation with the low expenses, related with the attraction of capital at the global financial markets and allowing the corporations of nonfinancial sector increase the leverage significantly, and the households – to provide increase of consumption, stimulating the growth of global GDP. The measures offered today for “curing” global financial system, ideally shall increase its stability and secure them from falling, similar to that, which took place in 2008. Another side of such reform will be the growth of real interest rates, decreasing the leverage level, increasing expenses of the corporations, related with capital attraction, decreasing rates of growth of consumption (moreover in the developed countries). It gives rise to the question foreseeing large circle of investigations on the subject, will such reform give rise to the essential slowdown of the rates of economic growth (we keep the issue about quality of economic growth aside)? Will the emerging countries (led by such flagman as China) recover the group of protectors of society of consumption or global economy will appear under depression conditions for long term? Primarily it is necessary to evaluate the changes, which took place at the global financial market during last 20 years and which preconditioned the changes, which appeared necessary.

## **2.2. Creation of Financial Economy and Changing the Role of Financial Intermediaries**

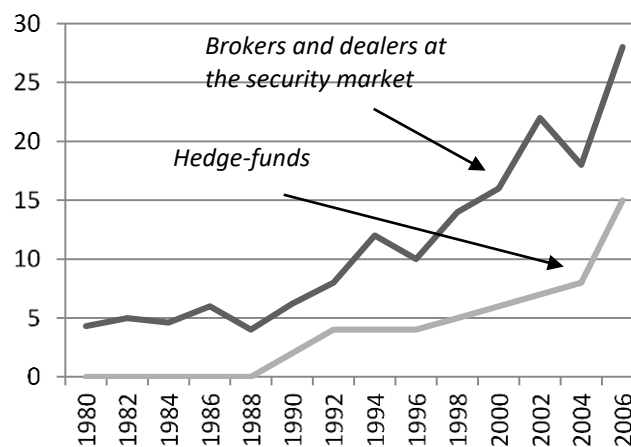
In many developed countries so-called financial economy was created, which occupied significant part of global economy. For many countries, financial services became important for national economy. For example, for Great Britain, which was able to turn London into the largest global financial centre, share of financial services in GDP fluctuate between 10 to 15% (per different evaluations). It is interesting to look at the share of capitalizations of the companies of financial sector in total capitalization of local financial market. In USA, this share reached 25% in 2007 (Figure 1.). The value reached same level in Japan at the end of 1980s, at the background of maximum values of Nikkei 225 index. This was followed by multiple years of recession. Any analogies are conditional, though evident; i.e. some consistencies allowing making conclusion regarding the measures of financial economy shall have its restrictions.

*Figure following on the next page*



*Figure 1: Share of financial sector in the capitalization of US exchange market  
 (Adrian T., Shin H., 2008, p. 256.)*

The structure of financial intermediaries was essentially changed. At the background of increasing of the exchange market, liberalization of financial markets, and globalizations the share of nonbanking intermediaries – investment and pension funds, hedge-funds, funds of direct investments and other nonbanking financial intermediaries. For example, in 2008, assets of mutual funds of USA amounted about 13 billion US Dollars, those of pension funds – 16 billion US Dollars, while banking assets not exceeding 11 billion US Dollars (according to International Monetary Fund). Moreover, the assets of investment companies and hedge-funds have been significantly increased (Figure 2.)



*Figure 2: Share of brokers, dealers and hedge-funds regarding banking asset  
 (Adrian T., Shin H., 2008, p. 256.)*

This gave rise to the new complexities for regulation of the agencies. Opportunities were created for the so-called arbitration on the control of agencies, regulating financial markets, while for different participants, different norms and procedures are applied, which conditioned opportunity for avoidance of essential restrictions and rules. Moreover, such situation gave rise to the risks related with the occurrence of “shadowed zone”, non-controlled by any of the regulators.

### 2.3. Changing the Functions of the Banks

During the era of Great Modernization, real erasing of the ties between investment and commercial banks took place. Separation originated in the 30s of the 20<sup>th</sup> century was related

with the evaluation of the investment risk of commercial banks at the security market during the boom of US exchange market in the 20s. At the background of continuous growth of quotation and strengthening speculative moods, the banks were engaged in the investments at the exchange market. Herewith, they actively attracted borrowings insured with the essential packages of shares, for the purpose of purchasing new ones. Existed credit pyramid played bad joke with the banks during Great Depression and gave rise to the bankruptcy of multiple US banks. The regulator, in his turn, was to declare bank holidays and to be engaged in the clearance of their balances independently. As a result, the Glass-Steagall Act was adopted, separating commercial banks into the investment and commercial ones. Except separation of the field of their activities, attraction of wholesale deposits was prohibited by the investment bank. Thus, the regulator tried to mitigate risks for the insurance system of wholesale deposits. This gave rise to the fact that many bank are liable to "split". For example, J.P Morgan Chase and Morgan Stanley appeared. In 1980s, at the beginning of the era of Great Modernization, gradual process of erosion of existed restrictions commenced in relation with the activities of commercial banks. Commercial banks were allowed to participate in underwriting of securities, at the beginning, exclusively with the fixed yield (state, then corporate), and then of the dealers. At the same time, the investigations took place, which showed that investment risks are characterised not only for the operations with securities, but also – for the ordinary commercial credits (in the event of continuity of evaluation of financial condition of the borrower and undertaking high risk per single borrower). Moreover, lobby of US banking sector spoke of the absence of such restrictions at the European and English markets. For real, restrictions were annulled after occurrence of financial supermarket Citigroup, which occurred after merger of banking and insurance business (the Company "Traveller"), which completely contradicted Gauss-Stiggle Act. Formally, prohibition disappeared after adoption of Gramm-Leach-Blale Act in 1999, when such mergers were allowed. Simultaneously, supporters of rejection of such restrictions were referring to the created and effective mechanism of risk management (VAR, etc.). Passed Crisis of 2000-2002 showed that the banks considered themselves quite calm at the background of fluctuations at the exchange markets. In the event of falling Dow-Jones Index during this period by 30%, cumulative index of US banks fell only by 5%, which spoke of the fact that US banks were adopted to the change of conjuncture at the financial market, and gave rise to the illusion about existence of developed system of risk-management with them. Though, formally the separation between the two types of banks existed, really, mutual interaction of their activities took place. For example, Boston Consulting Group, performing quarterly overview of the activities of investment banks, freely involved into their composition not only Goldman Sachs, Morgan Stanley, Lehman Brothers, Merrill Lynch, Bear Stearns, but also Citigroup, J.P. Morgan Chase and other banks, formally being considered to be commercial ones. In 2008, the Bank Lehman Brothers stopped existence, Merrill Lynch was absorbed by the Bank of America; Bear Stearns was of similar fortune (it was acquired by J.P. Morgan Chase). Remaining independent two investment banks Goldman Sachs and Morgan Stanley applied for reregistration in the banking holding () for the purpose of receiving credit resources from Federal Reserve System (according to the existed US legislation, investment banks could not claim obtaining borrowings at the expense of Federal Reserve System). Thus, formally separation into the investment and commercial banks was eliminated. In view of the aforesaid, in 1980s, distinctions between different investment and commercial banking was gradually disappeared. At the same time, the structure of returns of commercial banks was essentially changed as well. If at the beginning of 1980s, main source of returns for the banks was played by corporate crediting, in 2008, the situation was principally changed. Main article of returns was wholesale crediting (from the one side, more profitable, and on the other side – more risky) and noninterest returns, related with the operations and financial. Exchange and commodity markets (Figure 3).

At the beginning of 1990s, the articles “Will the Banks Survive?” were very popular. Under the conditions of the growth of nonbanking intermediaries and possibilities of large corporate direct entering the market (so called disintermediation) the banks were liable to adopt with the changed conditions. On the other hand, they were forced to this by the strengthened competition as at the national, so – international level. Growth of globalization was noted in the first place in the financial sector, which gave rise to the sharp growth of the level of consolidation in the financial sector (Figure 4).

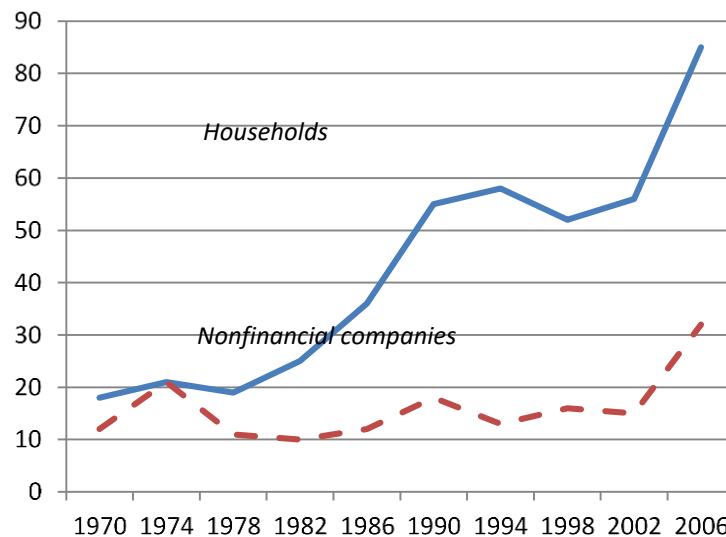


Figure 3: Debt of Households and Nonfinancial Companies, % on GDP  
(Report of Bank of England, 2008, p. 111)

Growth of the consolidation level, increasing share of noninterest returns, increasing “non-profile” kinds for the banking activities, strengthening competition in the sector, occurrence of new financial innovations (developed in high rates) required development of new methodologies of risk-management and more adequate actions for monitoring of the situation from the regulator’s side. However, regulatory system, created in the middle of 2000s, was not ready for this at all. Existed system of risk-management in the banks was not ready for the realities as well. To be more accurate, top management under the pressure of the shareholders were to be oriented in their work towards making profit, increasing profitability of their business. Failing to do so forecasted loss of the share of the market. Due to this, even when occurrence of particular warning signs from the side of the experts and risk-managers, they were not heard.

*Figure following on the next page*



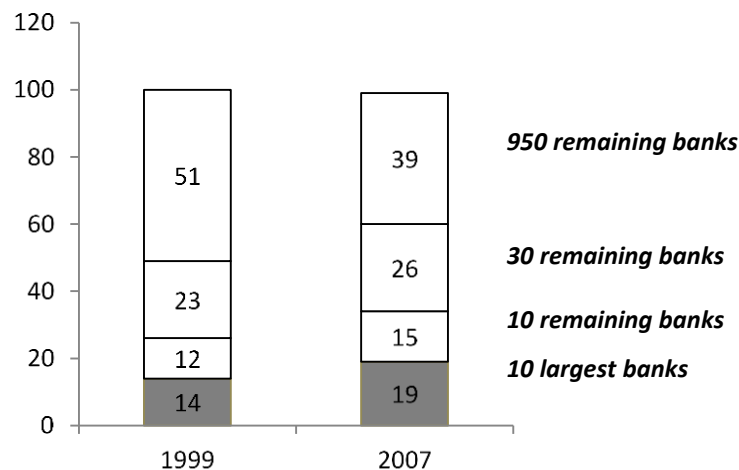


Figure 4: The Level of Concentration. Share of the Banks in the Assets of the Largest Banks of the World (International Financial services London, Banking, 2008)

The banking system, which overcame the dot-com crisis in 2000-2002 quite easily, observed future with optimism. Herewith, the banks significantly increased their leverage. The Figure 5 shows correlation of long-term equity against assets of US banks.

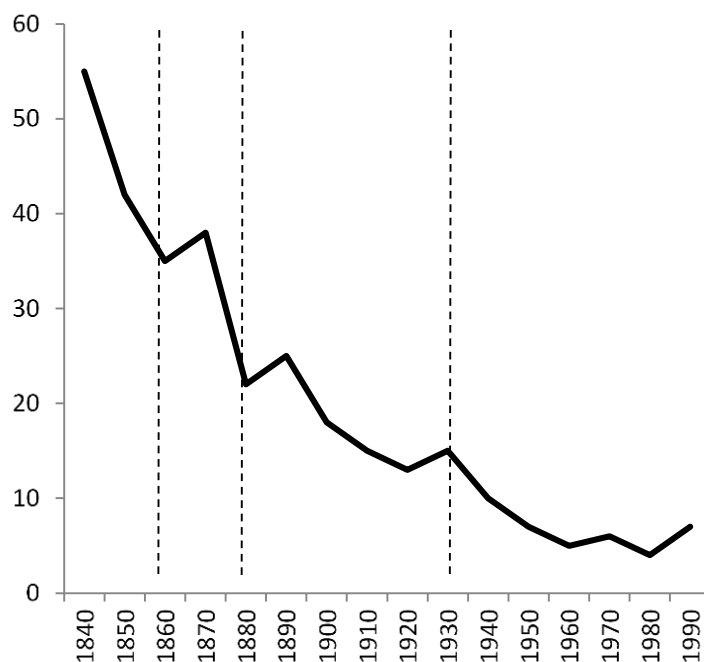
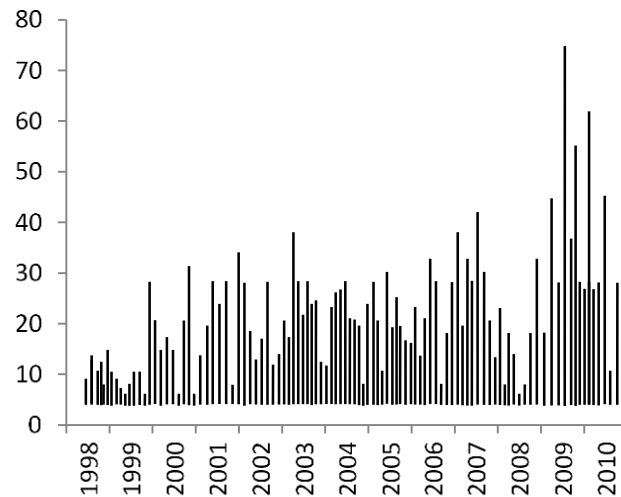


Figure 5: Correlation of long-term equity against assets of US bank (Berger A., Herring R., Szabo G., 1995, P. 405.)

This problem has another lobe. Decreasing participation in crediting corporations, banks push them out the market of corporate bonds. It is interesting that in 2009 historic maximums were achieved on emission of corporate bonds at the US market. Under the conditions when the banks are not in a hurry for crediting, and the enterprises are in need of the cash resources, the corporations are actively entering the market of bond loans. Moreover, the crash and freezing of the market in autumn of 2008 gave rise to the postponed demand at the market and postponed offers. However, it is also interesting that the record was registered at the European bond market as well (Figure 6).



*Figure 6: The volume of emission at the market of corporate bonds of Europe (Global Financial Stability Report, IMF, 2010, October)*

#### **2.4. New Risks: Globalization Risks**

Meanwhile, globalization at the financial market had other risks as well. They were related not only with the arge dependence of national financial system on the movement of financial flows from the side of financial investors. Rejection of restrictions on the movement of speculative capital, characteristic to many emerging countries in 1990s, was not fashionable. Growth of globalization of financial markets itself strongly increased opportunities of “infection” with financial crisis. However, not only in the emerging countries in regards with the financial relationship, but also in the developed ones. Another risk of globalization was related with arbitration on the actions of controlling bodies of different countries, when financial institute was able to use its nonresidential status and avoid control from the side of national regulator. The fact that this is possible is proven by the experience with the crisis of hedge-fund of Long-Term Capital Management (LTCM) in 1998, when this fund attracted borrowed sources of the largest financial institutes and performed operations at multiple risky equity markets, including the market of Russian state bonds, when using their managers’ reputation (their roles were plaid by the laureates of Noble Premium in the field of economy). When buying Russian ruble state bonds, the fund insured currency risk by purchasing currency forwards on the exchange rate of Russian Ruble. Herewith, at the moment before the crisis, size of the leverage (credit shoulder) of hedge-fund amounted more than 100. Market collapse of Russian state bonds, rejection of multiple counteragents on the payments under forwards, the problems at the equity market of the emerging countries suspected sustainability of further functional hedge-fund. The fund was recognized bankrupted. However, it was identified that the roles of its clients and creditors were multiple large financial institutes, facing large financial losses. The managers of G7 countries sanitized fund liquidation and the financial system remained sustainable. However the problem of interstate arbitrage remained. Other not less meaningful situation appeared to be fighting of Deutsche Borse for friendly takeover of London Stock Exchange. Two largest stock exchanges of Europe approved creation of Pan European Stock Exchange, which could compete with other global players. High volume of cash, accumulated by Frankfurt stock exchange, and large volume of trading, which is characteristic to London Stock Exchange, should do their work. The transaction was approved as by the regulators of Germany and Great Britain, so the largest shareholders of London stock exchange. However, the shareholders of German stock exchange were involved. The case is that this latter was and will be the stock exchange of the highest capitalization. Being vertically integrated holding, it includes more amounts of infrastructure institutes.

Except trading platform, it includes largest deposit systems of Clearstream, the exchange of derivatives of Eurex, several large trading systems at the base of Xetra platform, energy stock exchange etc. All these allow the stock exchange to generate huge amount of cash flows on continuous basis, making it leader among competitors; and this, in its turn, attracts foreign shareholders. For example, in 2005 it became evident that the shareholders of Deutsche Borse almost do not include German participants (their amount did not exceed 7%). It involves English and US hedge-funds. When learning about the fact that the stock exchange intended to waste approximately 10 billion US Dollars for procurement of competitor, the shareholders expressed doubt in the feasibility of such procurement and blocked the merger. This is the period the hedge-funds became one of the "Favorite Issues" at the meetings with the participation of German representatives. As soon as they speak about the reform of financial system and its regulation, German managers necessarily understand the necessity of "reigning in" of hedge-funds. They call them rebusts (locusts) in Germany. Let us review the phenomenon of hedge-funds in more details. The hedge-funds in particular way represent quintessence of financial globalization. Occurred in the 40s of the 20<sup>th</sup> century at the background of restrictions, related with the investments of retail investors into the joint funds (particularly, prohibition of short positions), primarily such funds were oriented towards rich people, being ready to undertake the risk of the investors (today called "qualified investors"). Taking into account the fact that these funds were not primarily tooled for the massive investments, they received offshore status, did not fell within the influence of particular national or transnational regulator. In due course, started particularly with the arbitration operations (procurement of undervalued and sale of overvalued shares). Extended their circle of the operations with the investments at the bond market, equity market, and commodity market. Macro-funds appeared, which were actively involved to the market of emerging markets; distress-funds, investing into the problematic assets; "event funds", specialized in investments, related with the merger and consolidation market etc. Functional extension of hedge-funds was accompanied with their geographic expansion as well. Being free of the "views" of national regulators, the funds appeared to be more mobile in the opportunity to shift capital from one market to another.

## **2.5. Problem of International Financial Regulators and Rating Agencies**

Passed crisis still gave rise to the question about quality of international financial regulators, their involvement and inability to avoid financial crisis. Neither in IMF, nor on International Bank became the institutes, which could coordinate activities of national financial regulators. Their reputation again became subject to suspicion. The issue arose as on the reforming of these institutions, so – occurrence of new ones, with the capacity to solve problems. When evaluating prerequisites of the crisis, we'd like to note the role of the international rating agencies in it. Three largest rating agencies – Standardt&Poors, Fitch, Moody's – are controlling larger share of the market, having long history, represent interesting objects for investment (the globally famous investor Warren Buffet holds the shares of rating agencies). It is evident that rating agencies became preconditions for the crisis. However, the fact that they made a bid into the crisis is evident. As a rule, rating agencies underestimate the risks related with the possible deterioration of the situation at the market before the crisis and show increased ratings of securities and issuers. And after beginning of the crisis, the ratings start falling in emergency order, trying to overtake the market. This prompts the market participants to the sales, and often these trading are of panicky nature. Hence it becomes that rating agencies support speculative growth of the market at the moment of boom, not giving adequate evaluation of the quality of the securities and issuers. During breakdown and the crisis, they strengthen volatility at the market. At the beginning, we wish to stand up for the rating agencies. During the era of financial innovations, it is quite problematic to evaluate new financial products correctly.

For example, we may review the bonds, issued based on the mortgage credits of subprime category with the floating rate. Here, the analyst shall evaluate the risks:

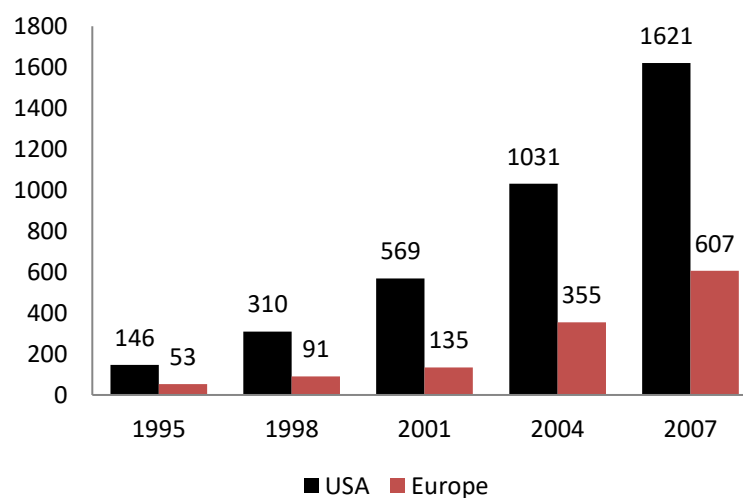
- Of growth of interest rates at the cash market, to which such credits are bounds;
- Probability of decreasing the prices at the market of real estate (for example, department of risk management of Fannie Mae in the beginning of 21<sup>st</sup> century evaluated the most pessimistic scenario for the market – this decreasing of prices by 10%, and they fell by 30% during three years);
- Opportunities of rejection of creditor of performance of liabilities on mortgage credit (so-called performance option);
- Expectation for occurrence of global crisis at the mortgage market. To take all these risks into account in one model is quite difficult, not speaking about the fact that many such products had extremely few amount of statistics for the similar conclusions.

Moreover, sharp growth of the market gave rise to the such great amount of new financial instruments, that rating agencies “could not overtake” the market. There are inconsistencies as well, which are included in the model of rating agencies itself. The first is related with the fact that there is the monopoly of three international rating agencies worldwide. Of course, their evaluations not always coincide with each other, they use different methodologies. However, they are three, and they lead entire investment community. Herewith, all of those agencies represent USA. This used to give rise to protests from the side of the national regulators several times, who tried to create alteration in the form of national rating agencies. Moreover, objectivity of evaluations of the agencies is prevented by the historically created model of their business. Rating agencies receive money from the issuers, who order their rating to them. Though, the rating agencies themselves speak about the fact that they avoid conflict of interests, the facts is the fact. Who pays – he orders the music. This gives rise to the fact that the regulators spoke about necessity of the reform of the system of evaluation from the side of rating agencies. In China they created rating agency, receiving money not from the issuers, but from their clients.

## **2.6. Can We Be Insured from the Financial Risks, or O Roles of the Derivatives?**

Herewith, important issue for evaluation of the risks is the one of the risk management. It shall be noted that during last 20 years they did not do much for improvement of the system of risk management; however, at the same time, at the background of creation effective protection mechanisms for the risks, new risks were created. For example, securitization of mortgage credits. Classic versions of securitization representing sale of assets by the bank-organizer of special legal entity, offered decreasing of the risk, related with the bank-organizer. Moreover, created instruments of increasing credit quality of the bonds through creation of excess provisions, insurance from the side insurance companies, necessary rating bonds should give rise to further mitigation of risks. However, this gave rise to the illusion on the fact that all risks are taken into account. Truly, as the crisis showed, the creditor’s risk remained unforeseen. However, it appeared to be conclusive for sharp fall of mortgage market. Occurrence of financial investments gave rise to the significant distribution of risks between the participants of the market. Occurrence of such synthetic product, as CDO (Collateral Debt Obligation), allowed creation of the mix between bonds of investment class and high profitable bonds. Herewith, many “cocktail” bonds received rating of investment securities. Extension of the class of such bonds was approved by the regulating bodies and rating agencies, however the risks related with such securities remained high. Mathematic models, proving profitability of such securities under the conditions of the crisis appeared to be unprofitable. Another hit of the season before the crisis was the market of dividends. Its volume was significantly increased before 2008, at the background of the crisis took place particular decrease of the volumes;

however, at the beginning of 2009, the market was entirely recovered after breakdown in 2008 (in nominal amount). Today, according to the assessment of the Bank of International Settlements, their price exceeded 623 billion US Dollars (Figure 7). Sharp growth of the volumes at this market, on the one hand, spoke about the increase of speculative composition and, from another – the fact that the participants of the market hoped for insurance of the risks through new instruments. Herewith, the market of derivatives was characterized with the fact that significant part of the engagements fell within non-exchange segment. Truly, this was creating new risks, which became clear in full, under the conditions of the crisis of 2008. Herewith, the peculiarity of the market was high concentration. For example, more than 125 billions of nominal costs of the derivatives fell within five US banks. It is evident that the nominal volume at the market of derivatives itself is not significant (maybe, cross-positions, hedging and arbitration), however such a high concentration of the sirs could not stay without reflection in its system of regulation.



*Figure 7: Increasing the volumes of trade at the market of derivatives in Europe and North America (at the stock exchange – in yearly expression and at non-exchange market – turnover of trading per day) (Trends on Financial Markets, Europe&USA, International Financial Services, London, Banking, 2009)*

## 2.7. Prospects of the Reform of Financial System

The reform of financial sector has commenced and has been going on for ten years. The discussions about the reform of global architecture of financial market are provided, as well as on the necessity if not creation of the global mega regulator, or at least formation of the agency, being engaged in the monitoring at the market and coordinated actions of cash investments. Huge activity is expressed by Global Financial Stability Board, coordinating work of the experts and regulators in direction of the reforms of regulation of financial sector. Recent meeting of G20 countries increased the share of the emerging states in IMF, offering them great amount of votes. All countries approved necessity for coordination of their actions at the exchange market, however; herewith, following issue remains to be still topical, how calls for coordination of the actions coincide with the actual policy of the countries, as it is possible to overcome actual imbalances with common actions. Huge work has been performed in the field of raising the level of bank equities. Basel Committee on Banking Supervision offered particular recommendations on the gradual increasing of the required own capital up to 4.5% of shares of the bank by 2019, on creation of buffer for unforeseen losses from 2013 and bringing it to 2.5% by 2019; bringing equity of the 1<sup>st</sup> level to 6% in 2019, existence of nominal equity in 8%, and taking into account buffer of bringing this number to 10.5% in 2019.

Other measures were offered as well for increasing sustainability of banks in view of their exposure to risks. Moreover, it is offered to strengthen observation functions, of permanent monitoring and creation of the agency, which would monitor the situation with the risks at the financial market at international level. The Act of Dodd-Frank adopted in USA introduced particular limits for trading with banks for their costs (in the event if they take state credits), decreasing opportunity for speculative trading of the banks and their possibility to influence on the formation of speculative balloon at the financial markets. This situation was adopted as a result of adoption of more acute so-called Walker's rule, offering to go back to the strict restriction to commercial banks for investment operations. Regulation organ of different countries approved the necessity for decreasing the level of influence of large banks over the financial system and global economy. It is not quite clear how to do this. Simple restriction of the measures of large financial institutes, their compulsory separation cannot give desired effect. However, it is evident, that particular decision will be taken in this regards; at least, taking measures towards the fact that the creditors and shareholders to assume responsibility for risky policy of the largest financial institutes. Moreover, the measures are being developed for restriction of the measure of the bonus of the managers of the largest banks and reducing the size of such payments with larger indicators of the bank performance. However, adoption of such restrictions faces opposition from the side of regulators of the leading countries. US regulator introduced stricter restrictions in relation with the possibilities of the banks to participate in other companies of financial sectors and hedge-funds. The state regulators intend to fight against shadow unregulated part of the financial sector as well. For example, in USA, hedge-funds with the assets of more than 150 million US Dollars are liable to complete necessary registration in US Sec (Securities and Exchange Commission). In total, global regulators took decisions about increasing transparency of activities of the hedge-funds. However, the necessity for rising transparency is recognized by the hedge-funds as well. Taking such measures regarding alternative trading systems, obliging the latest to represent information about pricing at these platforms is evident. This may include the decision on increasing transparency of CDS market, and its reliability. Particularly, in close future, the trading systems will appear with the instruments with central counteragent, which ideally mitigate the risk of counteragent and give rise to the increasing of reliability of the market as it is. The measures for restriction of the activities of financial investors at the emerging market may take place as well. The rumors about the fact that such measures in the close future would be adopted, gave rise to sharp strikes of volatility at the futures market. At the same time, adoption of such measures is not evident. In the first place, particular researchers speak of the fact that we may not relate growth of prices with the commodity assets, exclusively with increasing of the activity of financial investors (Irwin S. H., Sanders D. R., 2010, p.67). On the other hand, the accounting mechanisms existed today allow us separate positions of hedging, arbitration and speculative. The case is that the hedgers may open speculative positions. On the third hand, creation of particular artificial restrictions will negatively impact on the determination of real fair value of commodity assets. Another question is related with the protection of the rights of retail investors. In USA, guaranteed minimum on the deposits of individuals is increased; the agency is created which will be engaged particularly in the protection of investors' data at the financial market. Herewith, some restrictions in relation with the activities of the banks at the market of credit maps, in favor of retail investors; the procedures are also adopted for existed fall of the profit of the banks. There are other opinions about reforming of financial sector as well. G. Caprio (Caprio, 2009, p. 169) offers unexpected view on the opportunity of the reform of financial sector. The author refers to the fact that completed crisis was related with incorrect evaluation of risks, calculated based on the internal models of banks or rating agencies. Herewith, evaluation of the risk was founded on the normal distribution. Letting the banks use off-balance financing allowed avoidance of requirements regarding nominal share of own

capital. This gave rise to the obtaining opportunity by the banks to have very high financial lever and ungrounded high risks. Due to this, passed crisis, according to the authors – is the crisis of information and incentives. As a conclusion, they offer to create the system of regulation to be able to be adjusted with the serious changes at the market and comply with the high level of self-discipline with the participants of the market themselves. Moreover, it is necessary to arrange the information disclosure by the participants themselves, to let the market to monitor the participants and their risks themselves. And for this, financial incentives may be created for the employees of the regulator and financial institutes.

### 3. CONSLUSION

At the background of financial sector, the issue on coordination of national regulators at the local level and increasing their coordination at the global level arises. We have already reviewed the latter. However the issue on coordination at the national level remains unclear. For example, we may review USA and British system of regulation. US system of regulation for long period remained segmented, i.e. conditioned existence of multiple regulators, being responsible for particular sector of financial economy. Insufficiency of coordination of the attempts of different regulators gave rise to the increased functions of Federal Reserve System in course of the crisis. The system of regulation in Great Britain is much different, where at the base of self-regulated organizations of the market participants the mega-regulator – Financial Service Authority (FSA) was created – the agency having supervisory functions over all participants of the market, including the banks. Banks of England remained to be only “Night Guard”, i.e. responded exclusively for the regulation of monetary market. According to FSA, mega-regulators were created in Germany, France and Japan. However, passed crisis showed limited nature of such model. The case is that under the conditions of financial crisis, main acting period at the market became the agency, being able to offer liquidity. And the mega regulator has only supervisory functions. Moreover, quality of supervision is of doubt from the side of mega-regulator for financial position of the banks of Great Britain. It is evident that the reform will continue to the direction of decreasing possibilities for “regulatory arbitration”, as at the national, so – international market (Qoqiauri L., 2013, p. 558-571.). In course of performance of financial reform, we shall evaluate economic price of the reforms as well. Investigations show that the Act of Oxsley-Sarbainess adopted in 2002 gave rise to the increasing of market attractiveness for private investors; however, at the same time, strengthened disbursements of the company on the information opening. This gave rise not only to the fact that part of US companies were liable to reject the status of public companies, but also to the significant outflow of foreign investors and issuers to the international markets. Particularly, exactly during this period, London became the largest international trading centre, the leader in trading depository receipts and the volumes of primary public investments. In other words, the first threat of “strong tightening of bolts” is related with the opportunity of moving liquidity to other markets. And meanwhile, at the global capital market, continuing processes of consolidation, including in the field of infrastructure of financial market. At the end of October of 2010, they announced the fact of absorption of the largest trading platform in Asia – Australian Securities Exchange (ASX) by Singapore Exchange. Asian markets are becoming direct counteragents of the developed ones for attraction of capital. Another not less negative outcome of completing financial reforms may become increasing the cost of capital at the market. Under the conditions of Great Modernization, cost of borrowings at the debt market as well as that of own capital were being decreased, which gave rise to the sharp increase in the leverage level at the market. And still, the process of deleverage is not completed. However, reverse process – sharp growth of the cost of capital attraction – may be negatively reflected on the functioning of the global economy. It would not be complete to be depended only on above mentioned materials of causes of economic collapse.

The reasons were deeper. The reasons of the accomplished economic and financial reforms played a big role. It created new economic obstacles and disproportions. A wide range of transformations and decay of the state regulating role in economic reforms played a negative role in the frames of economic reforms. The plan was quite primitive: new market mechanisms, namely a market will improve the situation, eradicate disproportions, will support transfer to stable increase. Herewith, experience of the world economic development, especially regulating, socially oriented market economics functioning was not considered. Let's remember historic 1929-1933 great depression. It clearly showed that crisis-causing self-regulative mechanisms of that time cannot support to escape from the crisis and to create necessary macroeconomic regulating system. A country's macroeconomic regulation is not spontaneous but determined, regulated process which is not separated from thorough processing and fulfillment of the strategy of economic and financial transformations. It has nothing to do with vagueness of aims and tasks, stages of accomplishment, forms and methods. That is what happened after the crisis period and is still going on in my country, Georgia, where the factual absence of such strategy has become characteristics of fulfilled economic and financial reforms.

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## FRESH EVIDENCE ON THE INVESTMENT-ECONOMIC FREEDOM- GROWTH NEXUS IN OECD MEMBER STATES

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### ABSTRACT

*This paper aims to explore the nexus between investment, economic freedom and economic growth in the sample of 35 OECD member states in the time span 1996-2015. The empirical methodology relies on the panel VAR model. The findings of trivariate model suggest a significant negative response of GFC to EFI. Investment is however found to respond positively to the improvements in real GDP per capita. With regard to GDP it is found to respond negatively to the GFC as well as EFI. Lastly, economic freedom is found to respond negatively to GFC but positively to GDP. IRFs display the response of EFI to GDP to be negative only in the short-run reaching the positive value at the end of the period of interest. Similar conclusion can be drawn for the response of EFI to GFC. GDP is found to have a positive response to the EFI in both, short- and the long-term. Similar conclusion can be drawn for the response of GDP to GFC. GFC positively responds to and to GDP. This paper suggests a necessity for policy makers to support the economic freedom since it has a great potential to contribute to the both, investments and finally the economic growth of the countries of interest.*

**Keywords:** *economic freedom, economic growth, investment, panel VAR*

### 1. INTRODUCTION

The empirical evidence on the link between economic output and institutions is given by many authors (Sirowy and Inkeles, 1990). However, Doucouliagos and Ulubasoglu (2006) suggest that the relationship between economic freedom and economic output has not been explored quite extensively. Apart from that, there is a general consensus on the positive impact of economic freedom on economic output. Besides that, economic freedom is considered to be one of the most important pillars of the institutional structure of some country. Taking into account the challenges assigned with the economic growth, the understanding of the role of institutions is essential. Since the economic freedom is a component of institutional structure, the understanding of its role in economic growth is crucial. Every person needs to have the economic freedom, e.g. every human should have a right to govern its own activities and equity. In societies that experience the high level of economic freedom, human works and produces freely. Besides that, economically free societies enable individuals to invest in the way they like. Thus, there are many benefits of economic freedom including higher accomplishment, promoting the achievement of socio-economic objectives, human development, the reduction of poverty, increasing the standard of living and the protection of environment (Satrovic, 2017). This is due to the fact that human free to produce tends to come up with new ideas and to offer new products that can enhance the quality of the life. Taking this into account, the economic freedom tends to contribute significantly the investment approximated using gross capital formation as well as the real GDP per capita, what was the motivation to conduct this research.

The fact that the definition of economic freedom is the matter of discussion in research community and the lack of data supporting the definition are lacking, can explain the potential poor empirical evidence on the link between economic freedom and economic growth. However, the meaningful steps were taken in the end of 20<sup>th</sup> century to measure and define the economic freedom. For instance, Gwartney et al. (1996) outlines the importance of the index developed by the Fraser Institute while Holmes et al. (1998) highlights the importance of the index introduced by The Heritage Foundation. For the purpose of this analysis, we propose the Economic Freedom Index introduced by The Heritage Foundation. This index measures economic freedom for more than 20 years. It consists of twelve freedoms and covers the sample of 186 countries. To obtain the overall score, every 12 freedoms are graded. The scale includes the points from 0 to 100. These values are then averaged using the equal weight to obtain the overall score, e.g. every freedom is considered equally important. Thus, The Heritage Foundation suggests that these countries that take into account the economic reforms that will lead to the improvements in economic freedoms may benefit significantly from the opportunities to improve the economic output. On the other way, investment is expected also to have a significant positive impact on the economic growth. This is since it tends to increase the production possibilities and consequently employment opportunities that will lead to economic growth and increase the standard of living. The proxy variable of investment in this paper is the gross capital formation indicating the investment level in some country (Rajni, 2013). Investment is strongly connected with the savings. Thus by reducing the consumption in present, the savings opportunities are increased. It is believed that savings will support the investments that will boost the income and consumption in the future. Capital formation is also believed to be one of the key factors of the abilities of some economic to produce income. Rajni (2013) defines the capital formation as the rise in capital stock. Thus, it tends to increase income, the opportunities for employment and economic output in the countries. Moreover, if the inequality in income distribution is minimized, it will lead to the elimination of poverty. Besides that, capital formation tends to have a significant positive impact on the international trade. With regard to the international export, it is important to emphasize the fact that it can decrease the dependence on other economies. Thus, capital formation is believed to be one of the key factors of the improvement in economic output. Capital formation actually includes the amounts of money that private and public sectors invest in capital (equipment, buildings, machines etc.). With regard to the link between investments and economic freedom, it is important to emphasize that the countries with the high levels of the key dimensions of economic freedom are expected to gain more from spillovers in investment. There are few supportive arguments. First, Azman et al. (2010) suggest that less regulation tends to foster the progress of economy. This is since open market enables entrepreneurs to come up with innovative ideas. Moreover, the firms are eager to accept riskier business in a search for higher returns. The second argument is connected with the labor market. Strict regulations may prevent workers trained by foreign companies connected with foreign investments to enter local firms; the spillover effect is thus reduced. Property rights are also of the great importance. Multinational corporations prefer to launch their FDI to the countries where property rights are highly protected since these markets enable the development of R&D activities (Nunnenkamp and Spatz, 2004). With regard to previous paragraphs, this paper aims to analyze the link between these three economic terms of interest. It is expected to contribute to the research to date in a line that it takes into account the interdependencies between all three variables of interest, introduces the latest available data, analyzes impacts in both, short- and the long-term and suggests the significant policy implications. In addition, this paper provides important insights for policy makers supporting the need to contribute to the main dimensions of economic freedom since the spillover effects tend to be positive in terms of investments as well as economic growth.

This paper will present the overview of literature to the on the link between variables of interest. It will also present the methodology to be employed together with the explanation of the data and variables. The results section will display the empirical research together with the discussion of the obtained results. The last chapter will summarize the concluding remarks.

## **2. LITERATURE REVIEW**

The macroeconomic role of economic freedom did not obtain much attention among research community what was the motivation to conduct this research and to explore the nexus between economic freedom, investment and growth. Thus, this part of the paper summarizes the empirical evidence on the matter. Azman et al. (2010) have explored the link, if any, between FDI, growth and economic freedom. For this purpose they have collected the annual panel data for the sample of 85 economies. In terms of methodology, they have employed GMM. The findings suggest no significant impact of FDI on economic growth. However, this impact is conditional on economic freedom. Thus, those countries with higher level of economic freedom tend to attract more foreign direct investors. These findings are also supported by Barro (2000) indicating that the countries that pay much attention to the promotion and protection of property rights tend to attract foreign direct investments and thus to increase the growth performance. Doucouliagos and Ulubasoglu (2006) have employed the meta-analysis to explore the literature to date on the link between economic freedom and growth. The authors suggest a positive impact of economic freedom on growth. Besides this direct impact, the authors provide the evidence on the positive indirect impact over physical capital. Przeworski and Limongi (1993) have also proposed economic freedom to be an important determinant of growth. Thus, the models that do not take into account this macroeconomic variable are assumed to be misspecified. Xu (2018) promotes the economic freedom to be essential for operating a business. In addition it is recognized to be as an important determinant of foreign direct investments. They have collected the data for 155 countries and employed the gravity model. The results suggest a significant positive correlation between economic freedom and foreign direct investments. This result is found true in the sample of developing countries by Kapuria-Foreman (2007). Additionally, the positive correlation between the economic freedom and foreign direct investments is found true for the sample of East Asian countries by Quazi (2007). Al Najjar (2002) has investigated the determinants of economic growth. The results suggest a significant positive impact of economic freedom on economic growth. Thus, the results are found to be consistent with the general conclusion on the positive link between economic freedom and economic growth. This is since high levels of economic freedom stimulate the investment and enhance the trade and monetary freedom in the country. Besides that, propose the economic freedom as a key determinant of economic growth. These findings are consistent with Ayal and Karras(1998). De Haan and Siermann (1998) have explored the link between economic freedom and economic growth. They have tested the sensitivity of the results by employing a set of the measures of economic freedom. The findings suggest that the link strongly depends on the selection of the proxy of economic freedom. To measure the economic freedom they have used the indices proposed by Scully and Slottje (1991). Vukotic and Bacovic (2006) recommend the economic freedom as a significant determinant of economic growth since it reduces the barriers for business activities. It is assumed to have an indirect impact on economic growth since it tends to develop the institutional framework that is business friendly. To analyze the link between the economic terms of interest, the authors have proposed the various proxy measures of economic output suggesting the positive link. Pattanaik and Nayak (2014) have investigated whether or not the greater economic freedom contributes to the growth of Indian economy. The results suggest a positive impact of the key dimensions of economic freedom on economic growth. The findings are confirmed by Gwartney and Lawson (2003) suggesting the positive impact of economic freedom on both, economic growth and the national

income. With regard to the link between fixed investment and economic growth, Kwan et al. (1999) have explored this link in the case of China. The results promote the fixed investment as one of the most important determinants of economic growth in China. These findings are supported by Hao et al. (2018). In addition, Chen et al. (2008) suggest that investments tend to provide the better technology that is expected to increase energy consumption and promote the economic growth. Lastly, Abusomwan and Ezebuihe (2017) suggest that the economic output tends to be adequate determinant of the gross capital formation in the case of Nigeria over the period ranging between 1981 and 2014. These findings are supported by Jain and Baliyan (2014). The research to date provides mixed evidence on the link between economic freedom, economic growth and gross capital formation. In addition, it is important to emphasize that this link has not been explored quite intensively in the case of OECD countries what was the motivation to conduct this research. Taking into account the previous paragraphs, a positive link between variables of interest is expected.

### 3. METHODOLOGY AND VARIABLES

Panel VAR models are used in modern economic research due to their ability to deal with the heterogeneity among individuals (Abrigo and Love, 2016). Besides that, under the minimum restriction set, they enable the estimation of interdependencies that are dynamic. Additionally, impulse-response functions based on the structural form can be easily calculated by including the shocks. Due to its great popularity, the disadvantages of panel VAR models were explored quite extensively (Chari et al., 2008). Apart from the fact that there are some drawbacks, these models are expected to significantly contribute to DSGE models and are thus used to explore the link between many macroeconomic terms of interest. These models were proposed in 1980s (Sims, 1980). The idea was to introduce some option for SEM models. Very important feature is the assumption that all variables are endogenous. Taking into account the fact that this methodology is recently introduced in macroeconomic research, we have followed the methodological properties presented in Love and Zicchino (2006). Panel VAR model is very similar to the one that uses time-series data. The difference arises from the introduction of heterogeneity among individuals. Thus the panel VAR model to be estimated and interpreted in this paper can be summarized as following:

$$\begin{aligned}
 EFI_{it} &= \sigma + \sum_{i=1}^k \beta_i EFI_{t-1} + \sum_{j=1}^k \theta_j GFC_{t-j} + \sum_{m=1}^k \varphi_m GDP_{t-m} + u_{1t} \\
 GFC_{it} &= \alpha + \sum_{i=1}^k \beta_i EFI_{t-1} + \sum_{j=1}^k \theta_j GFC_{t-j} + \sum_{m=1}^k \varphi_m GDP_{t-m} + u_{2t} \\
 GDP_{it} &= d + \sum_{i=1}^k \beta_i EFI_{t-1} + \sum_{j=1}^k \theta_j GFC_{t-j} + \sum_{m=1}^k \varphi_m GDP_{t-m} + u_{3t}
 \end{aligned}$$

where the dependent variable is estimated as a function of lagged values of the variables in the models. The innovations are denoted by  $u$ . EFI (Economic Freedom Index) is a proxy of economic freedom. The data are collected on annual basis using the dataset of The Heritage Foundation. GFC denotes gross capital formation (% of GDP) and is used as a proxy of investment (Satrović, 2018; Satrović and Muslija, 2018). These data are collected from The World Bank datasets. Lastly, GDP is a proxy of economic growth obtained from The World Bank and can be defined as GDP per capita (constant 2010 US\$) (Muslija et al., 2018).

EFI is index while GFC is presented as a ratio, while GDP is expressed in constant 2010 US\$. To make data comparable, these variables are expressed in natural logarithmic form. With regard to the estimation, this paper suggests GMM method do be employed. Beforehand, it is necessary to control for the stationary properties of the variables and to determine the order of the panel VAR models. In order to choose the order of panel VAR models, we follow the propositions of Andrews and Lu (2001). The pair of vectors are expected to minimize the following model selection criteria (MMSC):

$$MMSC_{BIC,n}(k, a, b) = J_n(k_a^2, k_b^2) - (|b| - |a|)k^2 \ln n$$

$$MMSC_{AIC,n}(k, a, b) = J_n(k_a^2, k_b^2) - 2k^2(|b| - |a|)$$

$$MMSC_{HQIC,n}(a, b) = J_n(k_a^2, k_b^2) - Rk^2(|b| - |a|) \ln \ln n, R > 2,$$

where  $J_n(k, a, b)$  is  $J$  statistics of over-identifying restrictions for panel VAR that is  $k$ -variate, has order  $a$ , sample size  $n$  and  $b$  lags that are the basis for moment conditions. Maximum likelihood based criteria are denoted by BIC (Bayesian information criteria); AIC (Akaike information criteria) and HQIC (Hannan-Quinn information criteria) respectively.

To conclude, the empirical research will proceed to the calculation and interpretation of Impulse-response functions (IRFs) as well as the forecast-error variance decomposition (FEVD). Tiwari et al. (2013) suggests that the link the variables of interest can be explored while assuming the other shocks to be constant. There was also the necessity to select the confidence bounds. For this purpose, 200 Monte Carlo simulations are selected. The results are not opposite to those obtained using 1000 Monte Carlo simulations.

#### 4. RESULTS OF THE RESEARCH AND DISCUSSION

The results section introduces first the most important measures of summary statistics. Table one suggests the mean value of EFI to be 69.66%. The maximum reported value is 83.10% for Australia in 2012. The minimum reported value of 50.40% is recorded in Slovenia in 1996. Huge differences are reported among OECD member states in terms of economic freedom. With regard to investment, the maximum GFC value of 39.68% is reported for Korea in 1996. The minimum reported value of 9.82% is found for the case of Greece in 2015. These results are quite expectable taking into account the economic and political situations (wars, economic crisis etc.) in these countries in the years of interest. On average, GFC reaches the value of 23.44%. Lastly, with regard to the real GDP per capita, the maximum value is reported in the case of Luxembourg in 2007 while the minimum value is recorded in Colombia in 1999. The descriptive statistics suggests significant difference among 35 OECD member states in terms of the all variables of interest.

*Table 1: The main measures of descriptive statistics*

Statistics	EFI	GFC	GDP
Mean	69.66	23.44	35569.28
Sd	6.96	4.16	21369.34
Max	83.10	39.68	111968.00
Min	50.40	9.82	4629.50
skewness	-0.09	0.59	0.94
kurtosis	2.27	4.21	4.13
countries	35 (Appendix 1)		

*Source: Author*

As indicated in the methodological section, there is a need to test for the stationary properties of the variables. For this purpose, we propose the three commonly used unit-root tests. The stationary properties are tested in log levels as well as in first difference. Panel VAR model requires the variables to be I(1). Table 2 summarizes the results of the selected unit-root tests for the all variables of interest.

*Table 2: The selected unit-root tests*

Trend included in the model	lnEFI		D.lnEFI		lnGFC		D.lnGFC		lnGDP		D.lnGDP	
Method	Stat.	P-value	Stat.	P-value	Stat.	P-value	Stat.	P-value	Stat.	P-value	Stat.	P-value
Levin–Lin–Chu (LLC) t* test	-7.80	0.000	-22.88	0.000	-7.69	0.000	-15.38	0.000	-6.02	0.000	-11.94	0.000
Im–Pesaran–Shin test	-7.41	0.000	-20.22	0.000	-4.11	0.000	-12.99	0.000	0.41	0.659	-8.73	0.000
ADF – Fisher inverse chisquare	93.36	0.033	355.24	0.000	143.72	0.000	314.96	0.000	70.01	0.477	229.92	0.000

*Source: Author*

With regard of economic freedom, all three tests agree on the rejection of null hypothesis (all panels contain unit root) in the log level as well as in the first difference. Thus, this variable meets the assumptions of the panel VAR. The same holds true in the case of GFC variable. However, Levin–Lin–Chu (LLC) t\* test reports that both, log level and the first difference of the GDP, are reported to be stationary. However, Im–Pesaran–Shin test and ADF – Fisher inverse chisquare suggest that the log value of GDP is found to contain unit root. Apart from these results, all of the three tests agree on the stationary properties of the first difference value of real GDP per capita. Hence, all of the three variables are reported to be stationary for a 1% level of significance in first difference and are thus meeting the requirements of the panel VAR model. To estimate the panel VAR model, there is a need to determine the order of the model. For this purpose, we follow the propositions of Andrews and Lu (2001). Thus, we have calculated the J statistics together with the p value and R square. Moreover, it is essential to have a number of moment conditions to be higher than the number of endogenous variables. Table 3 presents the results that help to choose the appropriate order of the trivariate PVAR model that will be estimated and interpreted below.

*Table 3: The selection of the PVAR order*

Order	CD	J	J p-value	MBIC	MAIC	MQIC
1	0.477917	54.59644	0.001285	-112.653	0.596436	-43.8805
2	0.522484	33.74841	0.013527	-77.7509	-2.25159	-31.9029
3	0.497825	14.66943	0.100426	-41.0802	-3.33057	-18.1562

*Source: Author*

The MBIC and MQIC criteria agree on the first-order panel VAR since the values of these criteria are the lowest in the first row. However, the MAIC reports the opposing results suggesting the third-order panel VAR. Taking into account the fact that two out of three criteria agree and that we use annual panel data, we consider the first-order panel VAR appropriate and use GMM to estimate the model. Table 4 shows the empirical results of the three bivariate panel VAR models.

*Table 4: Bivariate VAR models*

Independent variables	Dependent variables				
	D.lnGFC	D.lnEFI		D.lnGDP	D.lnEFI
Model 1: GFC and EFI			Model 2: GDP and EFI		
D.lnGFC <sub>t-1</sub>	0.131 (0.055)**	-0.004 (0.024)	D.lnGDP <sub>t-1</sub>	0.433 (0.053)***	0.078 (0.086)
D.lnEFI <sub>t-1</sub>	-0.095 (0.063)	-0.248 (0.071)***	D.lnEFI <sub>t-1</sub>	-0.042 (0.022)*	-0.231 (0.067)***
Model 3: GDP and GFC					
	D.lnGDP	D.lnGFC			
D.lnGDP <sub>t-1</sub>	0.530 (0.074)***	0.377 (0.215)*			
D.lnGFC <sub>t-1</sub>	-0.065 (0.025)***	0.052 (0.074)			

Note: \*\*\*, \*\*, \* significant at 1%, 5% and 10% respectively.

Source: Author

The first bivariate model suggests a significant positive response of GFC to its lagged value as well as significant negative response of EFI to its lagged value. Other responses are not found to be significant. The second model suggests a significant negative response of GDP to EFI. This results is expected in the short-run since many of the jobs that are as opposed to the properties of economic freedom can be canceled out and increase unemployment rate. However, the long-run impact is expected to be positive which will be explored using IRFs. Table 4 suggests a significant negative response of GDP to GFC while GFC is found to responses positively to GDP in model 3. The stability properties are also explored for all of the models of interest. The eigenvalues lower than one suggest that all of the models meet the stability properties. To explore for the potential causal link between the variables of interest we have employed the Granger causality test. The Table 5 suggests a unidirectional causal relationship running from EFI to GDP. Moreover, the results provide the evidence on the bidirectional causal link between GDP and GFC. The other causal relationships are not found to be significant.

*Table 5: Bivariate models (VAR based Granger causality test)*

Equation	Excluded	chi2	p-value
D.lnGFC	D.lnEFI	2.293	0.130
D.lnEFI	D.lnGFC	0.029	0.865
D.lnGDP	D.lnEFI	3.686	0.055
D.lnEFI	D.lnGDP	0.840	0.360
D.lnGDP	D.lnGFC	6.923	0.009
D.lnGFC	D.lnGDP	3.089	0.079

Source: Author

Since this paper focuses on a trivariable VAR model, we rather proceed to the estimation and interpretation of this model. The results are shown in the Table 6.

*Table 6: A trivariable VAR model (GMM estimation)*

Independent variables	Dependent variables		
	D.lnGFC	D.lnGDP	D.lnEFI
D.lnGFC <sub>t-1</sub>	0.085 (0.073)	-0.063 (0.024)***	-0.056 (0.034)*
D.lnGDP <sub>t-1</sub>	0.358 (0.205)*	0.583 (0.072)***	0.272 (0.129)**
D.lnEFI <sub>t-1</sub>	-0.106 (0.058)*	-0.029 (0.022)	-0.250 (0.062)***

Source: Author

The findings suggest a significant negative response of GFC to EFI. This sign is expected in the short run since EFI can lead to the cancelation of the some business that are as opposed to the postulations of economic freedom. However, the response in the long-term is expected to be positive what will be explored further. Investment is however found to respond positively to the improvements in real GDP per capita. With regard to GDP it is found to respond negatively to the GFC as well as EFI. IRFs will used to explored whether this impact holds true in both, short- and long-term. Lastly, economic freedom is found to respond negatively to GFC but positively to GDP. Granger causality test presented in Table 7 suggests a significant causal link running from GDP and EFI to GFC. The joint impact of these two variables is also found to be significant. Moreover, a significant causal link running from GFC to GDP is also found. Additionally, joint link of GFC and EFI with GDP is found to be significant. Lastly, GFC and GDP are found to Granger cause EFI. However, joint impact is not found to be significant.

*Table 7: Trivariate model (VAR based Granger causality test)*

Equation	Excluded		
	D.lnGDP	D.lnEFI	All
D.lnGFC	3.033 (0.082)*	3.323 (0.068)	6.394 (0.041)
	D.lnGFC	D.lnEFI	All
D.lnGDP	6.698 (0.010)	1.787 (0.181)	9.017 (0.011)
	D.lnGFC	D.lnGDP	All
D.lnEFI	2.744 (0.098)	4.418 (0.036)	4.421 (0.110)

*Note: \* p-value*

*Source: Author*

The stability of the model is explored using the tabular and graphical procedure. The tabular procedure suggests all eigenvalues to be lower than one. Thus, these models are considered stable. These results are confirmed using that graph that displays all eigenvalues to lie within unit circle. To conclude the empirical part, we present the forecast-error variance decomposition of trivariate model as well as the IRFs. Table 8 shows that approximately 98.6%, 1.1%, 0.3% of the variability of GFC is explained by GFC, GDP and EFI respectively. Moreover, 39.0%, 60.8%, 0.2% of the variability of GDP is explained by GFC, GDP and EFI respectively while 0.3%, 1.5%, 98.2% of the variability of EFI is explained by GFC, GDP and EFI respectively suggesting that all of the variables of interest are very complex and require the selection of determinants to be conducted with the great attention.

*Table following on the next page*



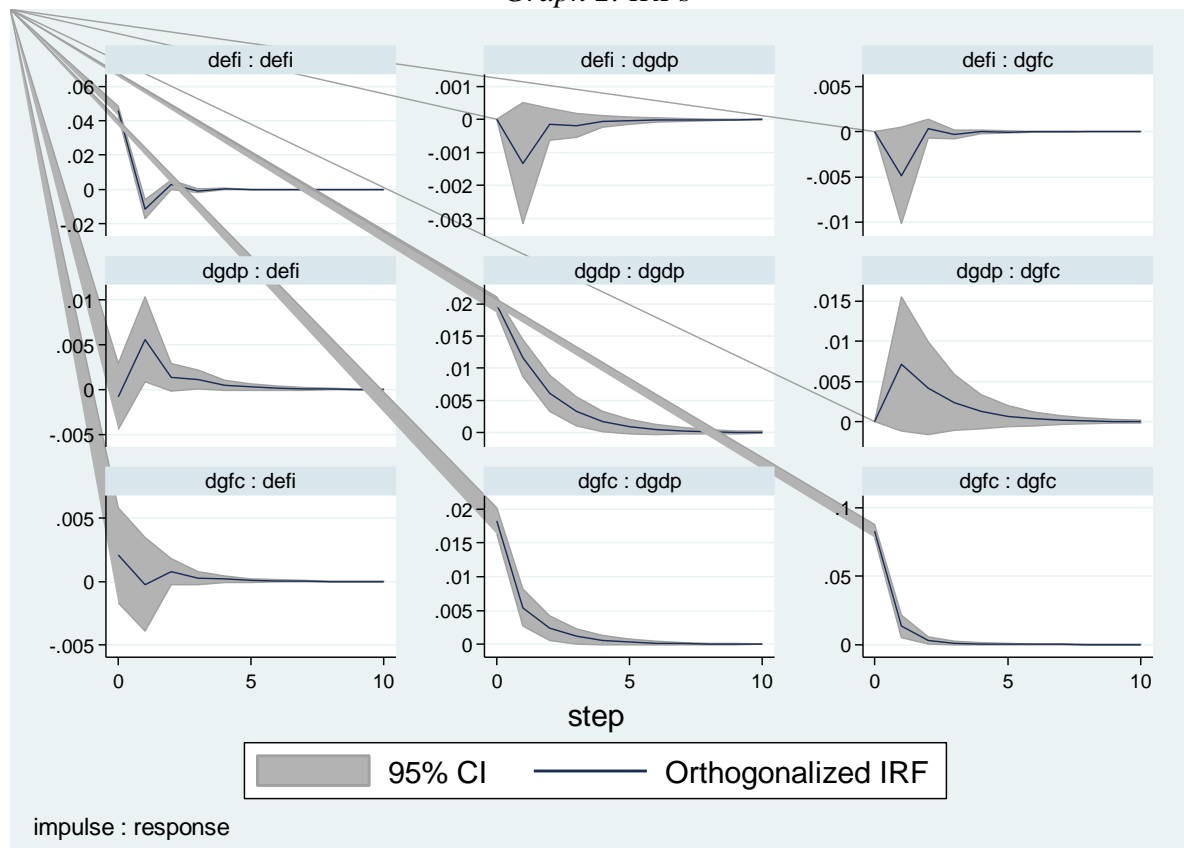
Table 8: FEVD

Response variable	Impulse variable			Response variable	Impulse variable			Response variable	Impulse variable		
D.lnGFC	D.lnGFC	D.lnGDP	D.lnEFI	D.lnGDP	D.lnGFC	D.lnGDP	D.lnEFI	D.lnEFI	D.lnGFC	D.lnGDP	D.lnEFI
0	0.000	0.000	0.000	0	0.000	0.000	0.000	0	0.000	0.000	0.000
1	1.000	0.000	0.000	1	0.460	0.540	0.000	1	0.002	0.000	0.998
2	0.989	0.007	0.003	2	0.408	0.590	0.002	2	0.002	0.014	0.984
3	0.987	0.010	0.003	3	0.395	0.603	0.002	3	0.002	0.015	0.983
4	0.986	0.010	0.003	4	0.391	0.607	0.002	4	0.002	0.015	0.982
5	0.986	0.011	0.003	5	0.390	0.608	0.002	5	0.002	0.015	0.982
6	0.986	0.011	0.003	6	0.390	0.608	0.002	6	0.002	0.015	0.982
7	0.986	0.011	0.003	7	0.390	0.608	0.002	7	0.002	0.015	0.982
8	0.986	0.011	0.003	8	0.390	0.608	0.002	8	0.002	0.015	0.982
9	0.986	0.011	0.003	9	0.390	0.608	0.002	9	0.002	0.015	0.982
10	0.986	0.011	0.003	10	0.390	0.608	0.002	10	0.002	0.015	0.982

Source: Author

Lastly, we plot and interpret IRF (Graph 1). The response of EFI to GDP is found to be negative only in the short-run reaching the positive value at the end of the period of interest. Similar conclusion can be drawn for the response of EFI to GFC. GDP is found to have a positive response to the EFI in both, short- and the long-term. However, this impact decreases over time. Similar conclusion can be drawn for the response of GDP to GFC. With regard of GFC it is found to positively respond to EFI but this response decreases over time. The similar conclusion can be drawn for the response of GFC to GDP. The impact in the short-run is much stronger than the impact in long-run.

Graph 2: IRFs



Source: Author

## 5. CONCLUSION

This paper explores the link between investment, economic freedom and economic growth. The annual panel data are collected for 35 OECD member states in the period between 1996 and 2015. The findings are presented for both, two-variables and three-variables models. The unit root test shows stationary properties at the first difference of the variables. Moreover, first-order panel is found to be appropriate. Bivariate models suggest a significant positive response of GFC to its lagged value as well as significant negative response of EFI to its lagged value. Moreover, a significant negative response of GDP to EFI is reported as well as significant negative response of GDP to GFC. The eigenvalues lower than one suggest that all of the models meet the stability properties. Granger causality tests provide the evidence on the bidirectional causal link between GDP and GFC. The findings of trivariate model suggest a significant negative response of GFC to EFI. Investment is however found to respond positively to the improvements in real GDP per capita. With regard to GDP it is found to respond negatively to the GFC as well as EFI. Lastly, economic freedom is found to respond negatively to GFC but positively to GDP. Granger causality test suggests a significant causal link running from GDP and EFI to GFC. The joint impact of these two variables is also found to be significant. Moreover, a significant causal link running from GFC to GDP is also found as well as the joint link of GFC and EFI with GDP. Lastly, GFC and GDP are found to Granger cause EFI. IRFs display the response of EFI to GDP to be negative only in the short-run reaching the positive value at the end of the period of interest. Similar conclusion can be drawn for the response of EFI to GFC. GDP is found to have a positive response to the EFI in both, short- and the long-term. However, this impact decreases over time. Similar conclusion can be drawn for the response of GDP to GFC. With regard of GFC it is found to positively respond to EFI but this response decreases over time. The similar conclusion can be drawn for the response of GFC to GDP. The impact in the short-run is much stronger than the impact in long-run. This paper suggests a necessity for policy makers to support the economic freedom since it has a great potential to contribute to the both, investments and final the economic growth of the countries of interest. Thus, key dimensions of economic freedom including rule of law, government size, regulatory efficiency and open markets should be stimulated since these can significantly contribute to the key macroeconomic variables explored in this research. Papers to date did not explore quite extensively the link between investment, economic freedom and economic growth. Hence, this paper tends to fill in this gap in literature by providing empirical evidence on the matter. Moreover, OECD member states are in general developed, and to have enough capacity to promote the key dimensions of economic freedom what was the motivation to take these countries into consideration. Thus, these findings tend to provide an important insight for policy makers on the necessity to support the development of the key dimensions of economic freedom since it tends to contribute to investments as well as economic growth. The recommendations for future research suggest the need to take into account the trade openness of the variables since trade freedom is important dimension of open markets. Moreover, it is of key importance to explore the potential impact of 2007-2008 financial crisis. At least, in addition to the joint impact of overall EFI index, there is a need to explore the relationship of interest by introducing the impact of every single component of EFI.

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## *APPENDIX*

The list of the countries:

- Australia
- Austria
- Belgium
- Canada
- Chile
- Colombia
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Israel
- Italy
- Japan
- Korea, Rep.
- Luxembourg
- Mexico
- Netherlands
- New Zealand
- Norway
- Poland
- Portugal
- Slovak Republic
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom
- United States

## VALUE AT RISK ESTIMATION OF THE MARKET INDEXES VIA GARCH MODEL: EVIDENCE FROM VISEGRAD COUNTRIES

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### **ABSTRACT**

*Stock markets stand as an important element within the financial system. Financial crises of 2008 showed that stock market crash influence the real economy. On the other hand, economic and financial globalization has created interdependency within national economies. The current research tends to measure risk exposure of the Visegrad stock markets (Czech Republic, Hungary, Poland and Slovakia). One of the indicators of the risk exposure of a financial assets is value at risk. In this study, value at risk is estimated using GARCH model in a dataset of almost three thousand working days per each stock markets. White noise process and ARIMA (1, 1) were applied to get more robust results. The worse stock index among Visegrad countries was identified SAX (Bratislava index, Slovakia) and the most promising one was BUX (Budapest index, Hungary). Value at risk is a useful tool that investors can use to analyze the performance of a share or market index in terms of risk exposure. Furthermore, it can be used even as an instrument to forecast the level of risk exposure an investor could face in the future.*  
**Keywords:** Stock market, value at risk, GARCH, Visegrad countries, rugarch

### **1. INTRODUCTION**

Risk is mainly measured through the volatility of returns. High volatility within financial securities generates uncertainties for financial investors. Financial decisions are prone of risk preferences. Risk preferences define expectations for future rewards. Risk is a key component in the investment decisions. Investors tend to maximize their return by minimizing their risk exposure. Nowadays, complexity of the financial system is enhanced, since within the system are involved diverse set of synthetic financial instruments. Hedging is one form of eliminating risk. However, hedging overall investments narrow the space for financial reward. Stock markets are the most complex arrangement of the capitalist system. Moreover, daily prices within the stock markets reflect fundamental conditions of the company, national economy, political environment etc. The crisis of 2008 proved that sometimes stock prices stand beyond economic reality. Moreover, the crisis affected not only the upside of the financial system but also income of the ordinary citizens. In many countries government intervention through fiscal stimulus was required. In addition, the crisis of 1929 and 2008 disproved the fundamental paradigms of neoliberalism that markets self-correct their own problems. Countries of eastern and central Europe reopened their stock markets after the communist system fall apart. Financial investors are concerned on the efficiency level of the eastern and central European

stock markets. The study conducted by Dragotă and Țilică (2014) on the ex-Soviet Union countries confirmed that number of stocks lie within market efficiency hypothesis. Risk linked with the stock markets is captured through volatility of returns. Higher volatility generates uncertainties among investors. Stock prices reflect future expectations of the company's outcomes. Fama (1968), considers that stock prices tend toward equilibrium where deviations from the mean are random and prone to short run speculations. Moreover, efficiency of the markets claims that nobody can achieve excess returns in the long run. In contrast, Soros (2003), pretends that markets are never in equilibrium since future outcomes are unknown. In addition, financial crises have spill over effects on the local and international economies. Financial and economic globalization has interconnected local economies with international one. Moreover, the economic downturn of 2008 showed that financial problems in one country are transmitted on the other countries. Value at risk (VaR) is extensively used risk instrument that measures portfolio probability of facing losses during a period of time (Angelidis, Benos, & Degiannakis, 2004). Moreover, VaR became widely used risk metric since the implementation of Basel Committee on the banking supervision. Moreover, banks are required (Basel III) to measure the risk of their portfolio, since it prevents banks from engaging to higher risk activities. Investors use VaR on the daily basis to protect their investments from higher risk exposure. Studies have confirmed that financial securities contain heteroscedasticity on the variance. Moreover, Engle (1982) and Bollerslev (1986) introduced autoregressive conditional heteroscedasticity model (ARCH) and general autoregressive conditional heteroscedasticity model (GARCH). In addition, volatility over time is measured with the GARCH family because they are constrained by heteroscedasticity (Orhan & Köksal, 2012). Since GARCH and ARCH were introduced, more than 100 forms of the GARCH family have emerged. However, still there is not consensus among economists which of the GARCH family has the strongest ability to forecast market volatility. Countries of eastern and central Europe went from the central managed economy into the market economy. Economic and political changes enabled creation of the stock market. Poland, Czech Republic, Slovakia and Hungary have created their stock markets via transforming the ownership structure of the state owned enterprises. Moreover, eastern European countries are constrained from limited number of listed companies. Eastern stock markets compared to the western stock markets are characterized from low turnover, inadequate number of analysis and less interest from international financial investors. Moreover, Poland stock market (WIG20) is the biggest stock market on the Eastern Europe based on the turnover and number of listed companies. Most of the works concerning the Visegrad countries were conducted on the issues concerning the influential factors that determine stock prices. Prazak and Stavarek (2017) claim that macroeconomic indicators have huge influence on the stock prices of the Visegrad countries. However, the study by Horobet and Dimetrescu (2009) indicate inflation has positive effect on the Visegrad stock markets while exchange rate negative effect. Stoica et al. (2014) confirm that international interest rate shows significant influence on the Visegrad stock markets. The work differentiates itself from the previous studies, since it is the first attempt (to our best knowledge) to measure risk level of the individual stock indexes (SAX, WIG20, BUX and PX index) based on the VaR model. Results of work gives clear outlook on the portfolio managers to get answer on the risk perspectives linked with stock markets of the VISEGRAD countries.

## **2. METHODS AND PROCEDURES**

The stock exchanges of the VISEGARD countries have been the research unit for this study. The study aims estimating the persistence and value at risk of the following stock indexes: PX, BUX, SAX and WIG20. GARCH model is performed to measure persistence and value at risk of the return of market indexes. Persistence can be account for as the sum of the ARCH and GARCH coefficients and value at risk was estimated based on GARCH results.

The ARCH and GARCH models were formulated by Engle (1982) and Bollerslev (1986), respectively. The depended variable was labelled  $r_t$ , which represent the return of the market index. GARCH( $p,q$ ) model can be written as below:

Mean equation:

$$r_t = \mu + \varepsilon_t$$

Variance equation:

$$\sigma_t^2 = \omega + \sum_{i=1}^q \alpha \varepsilon_{t-i}^2 + \sum_{j=1}^p \beta \sigma_{t-j}^2$$

Where  $\omega$ ,  $\alpha$  and  $\beta$  are estimated by the maximum likelihood estimation.

VaR can be estimated for a given probability level of the normal distribution using the conditional variance of the GARCH model (Çera, Çera, & Lito, 2013). To obtain robust results, white noise and ARIMA(1,1) are employed. To perform GARCH and ARIMA(1,1) computer statistical packages were used, such as EViews 9 and R. To compute the VaR back test, rugarch package of R was installed (Ghalanos, 2017). ARCH models can be extended in other forms, for instance in TGARCH (Çera, Dokle, & Çera, 2015), EGARCH, PARCH etc. The price of four stock exchange indexes from Visegrad countries are manipulated to achieve the objective. Data analysed in the current research covers the time spam from 2006 to 2017, and each stock exchange has reported almost three thousands days. Table 1 illustrates some key descriptive statistics about the stock exchange index daily returns of the VISEGARD countries for the time spam from 2 January 2006 to 13 November 2017. The number of the observations were not the same because these countries have different number of holidays. PX and SAX reflected a negative daily return means, whereas BUX and WIG20 had positive ones. The highest and the lowest mean among them was performed by BUX and PX, respectively. Moreover, they had quite the same standard deviations with some little differences. Most volatilities was within BUX index, followed by PX, WIG20 and SAX, manifesting these standard deviation values 0.0144, 0.0157, 0.0115 and 0.0126, respectively. So, we have seen a correlation between the daily means and volatilities: the highest daily return mean matched with the highest return index volatility – BUX. For contrast, the lowest index mean corresponded to the second lowest index volatility – SAX.

*Table 1: Descriptive data of the index returns*

		PX	BUX	SAX	WIG
Mean		-0.00011	0.00021	-0.00008	0.00019
Std. Dev.		0.01443	0.01572	0.01151	0.01255
Skewness		-0.53028	-0.08900	-1.14902	-0.48515
Kurtosis		18.9269	10.5273	25.8975	6.91651
Sample	From	1/2/2006	1/2/2006	1/9/2006	1/2/2006
	To	11/13/2017	11/13/2017	11/13/2017	11/13/2017
Observations		2976	2963	2899	2971

Attention have been paid to the fat-tails of the index daily returns. All the index returns showed evidence of fat tails, since the kurtosis statistic exceeds the normal value, which is considered the value 3, and figure of negative skewness, which indicated that the left tail is particularly



extreme. So, the index returns are not normally distributed. There is another factor to be consider when modelling the GARCH model and through it the value at risk: long memory of the time series. The index returns showed evidence of ARCH effects as tested by the autocorrelations of the squared residuals in Table 2. Beside the SAX case, all the autocorrelations of squared index returns were all positive and significant. The autocorrelation coefficients of the squared SAX return alternated between positive and negative values, which is common in most economic time series (Engle, 2001), and at its first lags were insignificant, but after the seventh lag they became significant. There were at least three reasons that suggested the implication of the GARCH model: clustering volatility, showed through the amplitude of the returns that varied over time; fat tail, controlled by skewness and kurtosis statistics of the index returns, and long memory, tested by the autocorrelation coefficient of squared index returns.

*Table 2: Autocorrelations of squared index returns*

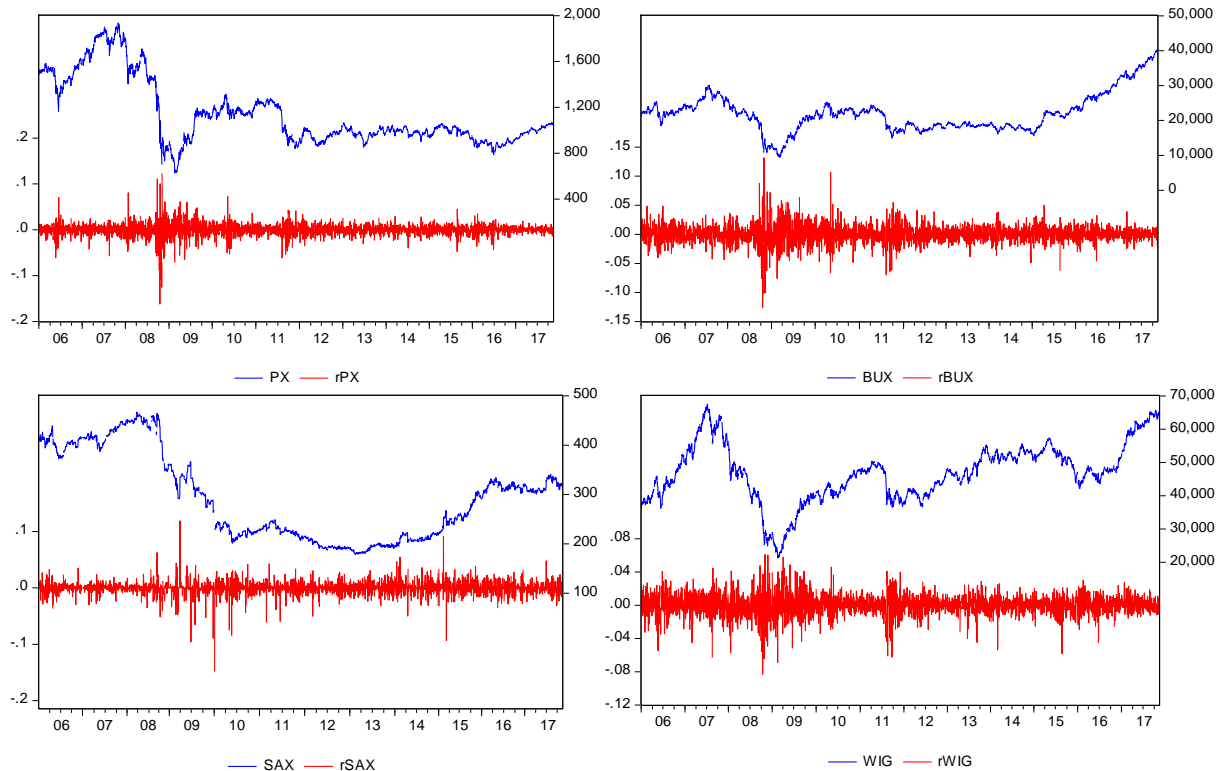
	PX		BUX		SAX		WIG	
	AC	Prob	AC	Prob	AC	Prob	AC	Prob
1	0.374	0.000	0.348	0.000	0.014	0.457	0.123	0.000
2	0.395	0.000	0.251	0.000	0.010	0.654	0.152	0.000
3	0.284	0.000	0.185	0.000	0.001	0.837	0.219	0.000
4	0.257	0.000	0.165	0.000	-0.001	0.931	0.241	0.000
5	0.331	0.000	0.202	0.000	0.000	0.973	0.219	0.000
6	0.180	0.000	0.349	0.000	-0.009	0.981	0.145	0.000
7	0.240	0.000	0.312	0.000	-0.005	0.991	0.151	0.000
8	0.227	0.000	0.317	0.000	0.133	0.000	0.192	0.000
9	0.266	0.000	0.168	0.000	-0.002	0.000	0.197	0.000
10	0.369	0.000	0.183	0.000	0.037	0.000	0.157	0.000

### 3. FINDINGS

#### 3.1. Descriptive statistics

Figure 1 represent daily prices of stock exchange index and its daily return for each countries stock indexes. Short description for each index, given while comparison is used to point out the similarities and differences within the stock indices. Aggregate prices within PX index increased during 2007 while in 2008 and the first half of 2009 index experienced huge downturn. Price level declined in the PX index during 2008-2009 from 1,936 CZK (Czech currency) to 628 CZK (68% decline in the price level). In addition, decline in the price level corresponded with the financial crisis of 2008 that started in the USA and followed the world financial system. High range of PX return (rPX) during this time interval indicate high risk that investors faced during 2008-2009. Moreover, PX index recovered after 2009 while in 2011 experienced another downturn that corresponds with the Eurozone-crisis. PX index in 2012 was characterized with stability on the price level while in 2016-2017 index experienced had a slight positive trend. Its "closed" price was almost 1,000 CZK, far below that the maximum achieved in 2007. Each group of range for rPX throughout the years marks a different cluster of the series, meaning that there is a significant different variance for each of them. Hungarian Stock Index (BUX) during 2008-2009 showed huge downturn where prices dropped at the level of 9,461 HUF (77% decrease) exposing all the investors within the index toward enormous financial risk. After 2009, the economic state followed positive changes, where the index experienced a gradual recovery. This indicates a promising opportunity for investors but at the same time it marks uncertainty for the future outcomes. In terms of return, BUX shows higher risk compared to PX index (note the range of the red line). SAX index during 2008, experienced a huge drop in overall prices. In contrast to other stock indexes, SAX continued to fall until 2010. Moreover,

during 2010 trading reacted positively but not for long time. In 2011, the fall of index prices once more followed a smooth decreasing trend. The end of 2013 and beginning of 2014 marked the gradual positive change for the stock exchange index of Bratislava. This shows that Slovakia “suffered” for several years the agony of having a negative trend of the stock exchange market. In addition, maximum price in 2008 reached 467 euro while in 2011 declined to 201 euro (57% decrease), which corresponded to the second major difference compared with other selected indices. During the most recent years the price for SAX did not record any progress.



*Figure 1: Price and return of the indexes. Blue colour shows daily stock prices while in red are represented daily stock market returns*

Meanwhile, the WIG20 index (Warsaw Stock Market) showed large uncertainties through the years compared to other stock indices. In 2006 and 2008, the index price reached 67,568 Polish zloty. Moreover, in June 2007 the index reached its peak which was followed by an enormous decrease in the prices level (69%). Despite the increase of index price during subsequent years, in 2011 the price decreases with 27%. The high level of the risk during this time is shown by the high range of rWIG20 (WIG return). From 2011 till 2015 the index had a positive long run trend. In contrast, after 2015 the WIG20 experienced another down turn shock in the aggregate price level. However, during 2016-2017 WIG20 performed positively, which succeeded almost the same trend with BUX and PX index. Each of the return series appeared to show the signs of ARCH effects in that the amplitude of the returns varies over time, which is called clustering volatility.

### 3.2. Empirical results

Table 3 summarises the empirical results of GARCH (1, 1) model (both mean and variance equations) for four stock indexes. Beside the constant from the mean equation of the SAX, all the other coefficients resulted statistically significant. These results indicated that the volatility of stock return of Visegrad countries can be predicted. SAX model did not satisfy all the requirements so it was not interpret. The sign of the coefficients were positive.

The long-run average variance ranged from 0.0128 in case of WIG to 0.01534 in case of BUX. As it can be seen, the return of WIG reflected the highest level in terms of long-run average variance, which indicates it as less risky compared to other stock markets returns. By persistence, we mean that relatively high recent volatility implies a relatively high forecast of volatility in the near future. Likewise, with persistence, recent low volatility is associated with a prediction of lower volatility in the near future. Furthermore, the persistence of the models were reported to be close to one. This means that the stock returns analysed here can be predicted.

*Table 3: Empirical results of GARCH models*

	PX	BUX	SAX	WIG
C	0.000335**	0.000630***	-0.000055	0.000402**
<i>Variance Equation</i>				
$C = \omega$	3.2E-06***	4.0E-06***	4.6E-07***	1.6E-06***
$ARCH(1) = \alpha$	0.13845***	0.09863***	0.02055***	0.07059***
$GARCH(1) = \beta$	0.84741***	0.88420***	0.97734***	0.91989***
Long-run average variance	0.01509	0.01534	0.01473	0.01280
Persistence	0.98586	0.98283	0.99789	0.99048
Prob ARCH LM test (lag=7)	0.9397	0.9203	0.8138	0.4595
(lag=15)	0.6828	0.9869	0.0000	0.8456
Prob Ljung box test (lag=7)	0.941	0.921	0.800	0.432
(lag=15)	0.671	0.985	0.000	0.811

*Note:* \*, \*\*, \*\*\* represent 90%, 95% and 99% significance level. Long-run average variance =  $\sqrt{\omega/(1 - \alpha - \beta)}$ , Persistence =  $\alpha + \beta$ . These models were run in EViews 9.

Obtaining the above results from GARCH models, give us the possibility to calculate VaR for the four stock exchange indexes of Visegrad countries. To do so, computer statistical package R was employed (for R syntax refer to Appendix) (Daróczi et al., 2013). As suggested by Daróczi et al., (2013), a useful test for checking the model performance is to do a historical backtest. In a risk model backtest, we compare the estimated VaR with the actual return over the period. If the return is more negative than the VaR, we have a VaR exceedance. In our case, a VaR exceedance should only occur in 1%, 2.5%, 5% and 10% of the cases (since we specified 99%, 97.5%, 95% and 90% confidence levels). The R package provide two test dealing with backtesting the risk model. Kupiec's unconditional coverage compares the number of expected versus actual exceedances given the tail probability of VaR, while the Christoffersen test is a joint test of the unconditional coverage and the independence of the exceedances. In Table 4 are summarized the results of these tests for alpha level of 1%, 2.5%, 5% and 10% per each stock market index return, assuming a white noise process. In the case of *rPX*, for the specified 99% confidence level, the actual exceedances are 66, while the expected are 29. This means that the red line touches blue line 66 times, while it was expected to be less than 29 times (see PX graph at Figure 2). This means that according to Kupiec's and Christoffersen's tests for unconditional and conditional coverage, data reject the null hypothesis of correct exceedances. Similar results are found even in case of alpha equals to 2.5% and 5%.

*Table following on the next page*

Table 4: VaR backtest report GARCH(1,1) and arimaOrder(0,0) – white noise process

	rPX				rBUX				rSAX				rWIG			
alpha	1%	2.5%	5%	10%	1%	2.5%	5%	10%	1%	2.5%	5%	10%	1%	2.5%	5%	10%
Expected	28.6	71.9	143.8	287.6	28.6	71.5	143.1	286.2	28	70	140	279.9	28.7	71.8	143.5	287
Exceed																
Actual VaR	66	125	180	304	61	96	169	300	73	102	142	230	64	111	184	293
Exceed																
Actual %	2.3%	4.3%	6.3%	10.6%	2.1%	3.4%	5.7%	10.5%	2.6%	3.6%	5.1%	8.2	2.2%	3.9%	6.4%	10.2%
Reject Correct	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Exceedances <sup>1</sup>																
Reject	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Conditional																
Coverage <sup>2</sup>																

Note: This test was computed in R using rugarch package (Ghalanos, 2017).

<sup>1</sup> Unconditional Coverage (Kupiec), where Null-Hypothesis: Correct Exceedances;

<sup>2</sup> Conditional Coverage (Christoffersen), where Null-Hypothesis: Correct Exceedances and Independence of Failures.

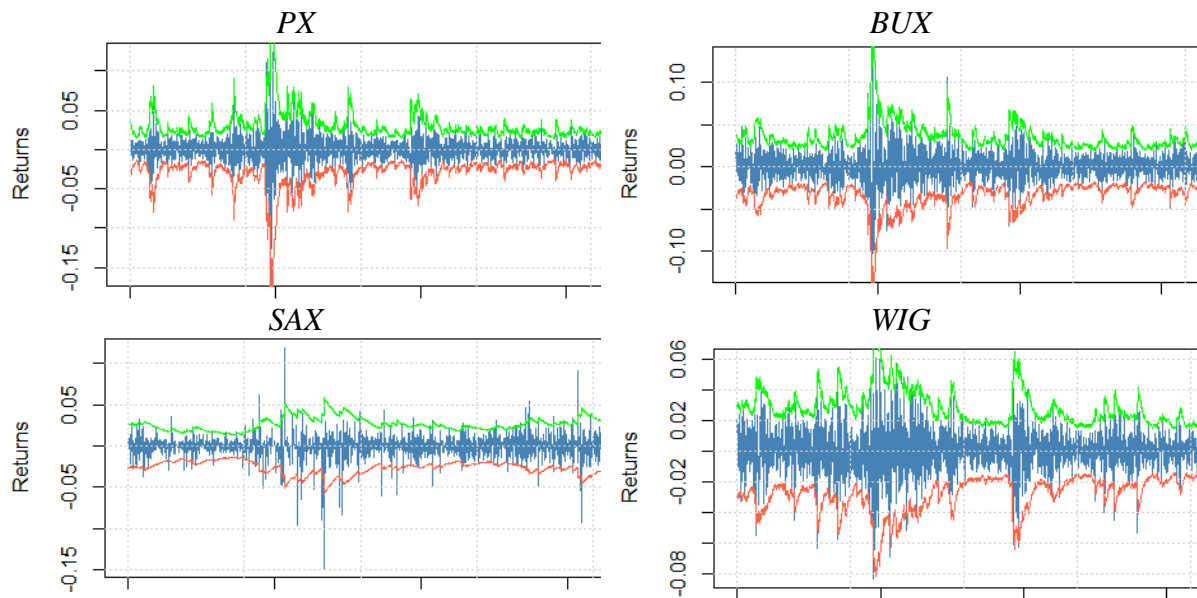


Figure 2: The return and VaR boundaries per each index – GARCH (1, 1) and arimaOrder(0,0), alpha equals to 1%. Computed in R using rugarch package (Ghalanos, 2017)

Table 5: VaR backtest report GARCH(1,1) and arimaOrder(1,1)

	rPX				rBUX				rSAX				rWIG			
alpha	1%	2.5%	5%	10%	1%	2.5%	5%	10%	1%	2.5%	5%	10%	1%	2.5%	5%	10%
Expected	28.8	71.9	143.8	287.6	28.6	71.5	143.1	286.2	28	70	140	279.9	28.7	71.8	143.5	287
Exceed																
Actual VaR	77	130	200	317	65	105	180	324	75	104	147	239	68	117	191	314
Exceed																
Actual %	2.7%	4.5%	7%	11%	2.3%	3.7%	6.3%	11.3%	2.7%	3.7%	5.3%	8.5%	2.4%	4.1%	6.7	10.9%
Reject Correct	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Exceedances <sup>1</sup>																
Reject	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Conditional																
Coverage <sup>2</sup>																

Note: This test was computed in R using rugarch package (Ghalanos, 2017).

<sup>1</sup> Unconditional Coverage (Kupiec), where Null-Hypothesis: Correct Exceedances;

<sup>2</sup> Conditional Coverage (Christoffersen), where Null-Hypothesis: Correct Exceedances and Independence of Failures.

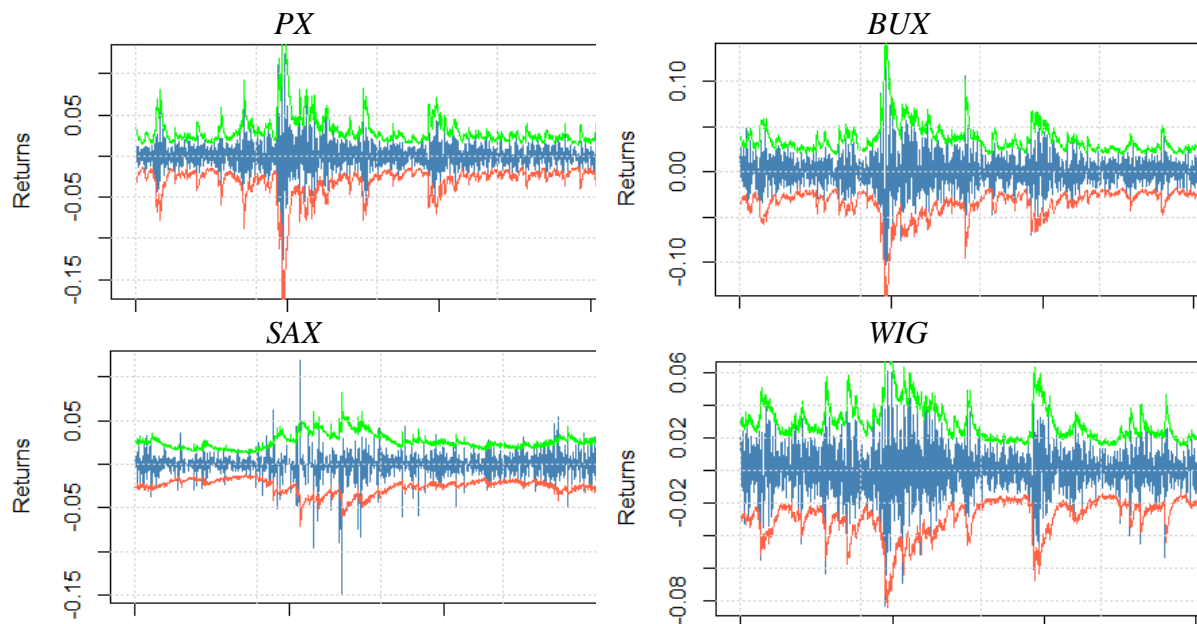


Figure 3: The return and VaR boundaries per each index – GARCH(1,1) and *arimaOrder(1,1)*, alpha equals to 1%. Computed in R using *rugarch* package (Ghalanos, 2017)

However, when alpha value is 10%, both tests support null hypothesis that exceedances and independence of failures are correct. Thus, VaR can be forecasted only for the specified 90% confidence level. In the case of rBUX, better results are found. Kupiec's test suggested not to reject the null hypothesis for alpha equal to 5% and 10%, while Christoffersen's test revealed that the null hypothesis are supported when alpha equals to 2.5% and 10%. Therefore, the VaR of the return of BUX index can be forecasted. In the case of rWIG, worse results are found as compared to rPX (see Table 4). Kupiec's test suggested not to reject the null hypothesis for alpha equal to 10%. So, the VaR of the return of WIG index can be forecasted only when employing 90% confidence level. The results of rSAX are not interpreted since its GARCH model do not satisfy all assumptions. In Table 5 are shown the results of the same analyses illustrated in Table 4 and Figure 2. The only difference is that in Table 5 and Figure 3 are shown results of the analyses assuming a ARIMA(1,1) process. These figures can be interpreted as in case of Table 4 and Figure 2. To summarize, assuming a white noise process provided better results than ARIMA(1,1) process. Further, among Visegrad's stock markets, BUX can be easier forecasted, since VaR model found significant results.

#### 4. CONCLUDING REMARKS

Stock markets are important part of the overall financial system. Stock markets of the Visegrad countries are new and reopened after the fall of communism in 1990s. However, stock markets in the Visegrad countries do not stand as the major source for financing business activities. Banks are the main lenders of the business operations within the economies of the Visegrad countries. Studies have confirmed that stock exchanges of Visegrad countries stand as a weak efficient form. The weak efficiency shows that stock prices do not reflect the economic conditions of the country. International investors tend to have attention on these stock exchanges since they are not so much integrated with the international stock exchanges. Lack of integration provide space for diversification benefits. However, the study tends to measure risk level imposed on the Visegrad stock exchanges, such as: Prague Stock Exchange (PSE), Budapest Stock Exchange (BUX), Bratislava Stock Exchange (SAX) and Warsaw Stock Exchange (WIG20).

The results of our work confirm that risk level of the Visegrad stock exchanges can be predicted. The results from SAX did not fulfil all the requirements so we cannot give a clear interpretation. Moreover, the results from SAX were expectable since the exchange is characterized from small number of listed companies and low turnover level. Lack of turnover do not move stock prices that shows investors attitude toward Bratislava Stock Exchange. Results of the work show that BUX contains the highest capability to predict risk. On the other hand, BUX is the highest risky index, followed by PX. Furthermore, the persistence of the model represents results close to one that claims that stock returns can be predicted on the Visegrad stock exchanges. Results of the study contain proper signals for the individual and institutional investors on the risk level exposed on the Visegrad stock exchanges. Institutional investors allocate their investments on the indexes of the Visegrad countries based on their risk preferences. However, risk preferences stand on the risk-reward trade-off. The results of the work capture solely the risk level but not the returns generated from capital gains and dividends that stands as a limitation of our study.

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## *APPENDIX*

### **R syntax:**

```
> library("tseries")
> library("base")
> library("forecast")
> library("FinTS")
> library("rugarch")
> library("parallel")
> library(readxl)
> WIG <- read_excel("Directory in C", sheet = "WIG")
> View(WIG)
> plot(WIG$t, WIG$rWIG, main = "WIG return", xlab = "Date", ylab = "Return", type = "l")
> spec_garch_WIG11 = ugarchspec(variance.model = list(garchOrder = c(1, 1)), mean.model = list(armaOrder = c(1, 1)))
> fit_garch_WIG11 <- ugarchfit(spec = spec_garch_WIG11, data = WIG$rWIG)
> fit_garch_WIG11
> spec_garch_WIG00 = ugarchspec(variance.model = list(garchOrder = c(1, 1)), mean.model = list(armaOrder = c(0, 0)))
> fit_garch_WIG00 <- ugarchfit(spec = spec_garch_WIG00, data = WIG$rWIG)
> fit_garch_WIG00
> cctrl = list(tol = 1e-7, delta = 1e-9)
> roll_garch_WIG <- ugarchroll(spec_garch_WIG00, WIG$rWIG, n.start = 100, refit.every = 1, refit.window = "moving", solver = "hybrid", calculate.VaR = TRUE, VaR.alpha = c(0.01, 0.025, 0.05, 0.10), keep.coef = TRUE, solver.control = cctrl, fit.control = list(scale = 1))
> report(roll_garch_WIG, type = "VaR", VaR.alpha = 0.01, conf.level = 0.99)
> roll_garch_WIG11 <- ugarchroll(spec_garch_WIG11, WIG$rWIG, n.start = 100, refit.every = 1, refit.window = "moving", solver = "hybrid", calculate.VaR = TRUE, VaR.alpha = c(0.01, 0.025, 0.05, 0.10), keep.coef = TRUE, solver.control = cctrl, fit.control = list(scale = 1))
> report(roll_garch_WIG11, type = "VaR", VaR.alpha = 0.01, conf.level = 0.99)
```



## RELATIONSHIP BETWEEN OWNERSHIP STRUCTURE AND INTELLECTUAL CAPITAL EFFICIENCY IN HUNGARIAN COMPANIES

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### ABSTRACT

*The theoretical paper extends previous research on the topic of the relationship between ownership structure as a measuring criterion of corporate governance and efficiency of intellectual capital as one of the variables to create competitive advantage and efficiency. The paper focuses on two aspects: the relationship between venture capital and intellectual capital efficiency and managerial ownership and intellectual capital efficiency, explaining the relationship between them on the basis of agency theory. The paper presents the possibilities of intellectual capital measurement by using Pulic's model, namely the value added intellectual coefficient (VAIC) on a sample of Hungarian listed companies, which helps to verify the presumption that there is a significant relationship between the use of venture capital and intellectual capital efficiency while managerial investors decrease the performance of companies' intellectual capital, which is partly consistent with some previous studies. The results of the theoretical study will be tested by empirical research, which results will be published in a next paper. The findings of this study suggest new direction for the future research, namely future work should widen the measurement of intellectual capital to other economies in order to further develop our understanding on intellectual capital efficiency of firms in emerging economies from an ownership and corporate governance perspective.*

**Keywords:** *Agency theory, Corporate governance, Intellectual capital (IC), Ownership structure, Venture capital*

### 1. INTRODUCTION

The digital revolution and other technological breakthroughs of the past several decades have brought intellectual capital to the forefront of new venture based on innovation. Economic interests in intellectual capital grows primarily out of the critical importance of innovation to social welfare. In a knowledge-based economy, the importance of intellectual capital (IC) investments is recognized because the knowledge assets affect the firm's long-term competitive advantage and value creation (Lev, 2001, 2004; Cabello-Medina et al., 2011). Furthermore, IC is an important resource for firm's innovations and human development through knowledge share (European Commission, 2010, 2013; Nonaka and Takeuchi, 1995). There are several research papers in the field of intellectual capital, but this area need further explore in order to understand the creation and use of intellectual capital in the corporate governance of Hungarian businesses. Recently, the subject of corporate governance has become one of the key issues of trade as a result of the expansion of agency theory. If company has a proper, well-functioning corporate governance system, it is easier to draw the attention of the investors and to convince them to invest in the business, not to mention that the company can achieve better financial result by applying these policies. From the above mentioned reason venture capitalists invest in those firms, where new technologies and intellectual capital could be discoverable.

Nowadays knowledge represent a big value for companies and knowledge as intellectual capital and intangible assets can lead companies to innovation, which can generate competitiveness to other companies. So venture capitalists are interested in to invest money in those companies where intellectual capital is well designed, which has a tight relationship with corporate governance. One of control and corporate governance methods is to determine the type of ownership structure and its optimal composition. The specificities of IC investments may lead to adverse selection, moral hazard and an opportunistic behaviour of managers (Holland, 2006; Aboody and Lev, 2000). Stiglitz (1985), Shleifer and Vishny (1986), and Huddart (1993) argue that concentrated ownership is required to provide shareholders with adequate incentives to engage in active corporate governance. Corporate governance is therefore more effective under concentrated rather than dispersed ownership systems. But Allen and Gale (2000) note that active corporate governance by large shareholders can also create interference in activities that are best delegated to managers. The above mentioned was rejected by Carlin and Mayer (2003) and they argued concentrated rather than dispersed owners appear to offer the commitment sought by outside investors and stakeholders. Contradictory, according to our viewpoint, dispersed ownership structure might positively effects firm performance. When a venture capitalists appears as a foreign investor, it has a significant effect on managerial behaviour which might positively impact IC value and development. So corporate governance might more effective when foreign ownership appears in the dispersed ownership structure as venture capitalist has devices to incentive managers to manage IC in a more effective way. High ownership concentration and lack of willingness to share control may block the entrance of qualified and well-trained managers (Miller and Le Breton-Miller, 2006; Westhead and Howorth, 2006; Greco et al., 2014), and the presence of a high number of family members as executives can increase conflicts and loss of efficiency which affects the firm's objectives (Gomez-Meja et al., 2007; Miller and Le Breton-Miller, 2006; Greco et al., 2014). Ownership concentration can have a negative effect on IC value creation and development. On the one hand, Gedajlovic and Carney (2010) argue that firms with ownership concentration are disadvantaged in value creation from IC. On the other hand empirical evidence suggests that ownership concentration might positively impact on firm's performance and value (Shleifer and Vishny, 1986; Denis and McConnell, 2003). The above mentioned studies show that ownership structure and various compositions of owners have different effects on performance of companies, which means nowadays the entrepreneur is willing to bear a lower share price, because a more dispersed outside ownership grants him more effective control and higher private gains (Burkart, Gromb, Panunzi 1997). This paper intends to address this issue by examining the role of company's owners and their incentives to increase intellectual capital value as a modern index for performance and value-creation together with the ownership structure as a part of company management mechanism. The aim of this study is to analyse the association between managerial ownership and intellectual capital efficiency (ICE) and venture capital and ICE measured by the value added intellectual coefficient (VAIC) and explain the relationship between them on the basis of agency theory. The study refers to verify the influence of ownership structure on IC management. The current paper structured as follows. In Section 2, we present the theoretical framework of agency theory and ownership structure, the relationship between ownership structure and companies performance is described in Section 3; in Section 4, we discusses the connectivity of ownership structure and intellectual capital efficiency and the results; Section 5 presents the conclusion.

## **2. AGENCY THEORY AND OWNERSHIP STRUCTURE**

The efficiency of companies and intellectual capital efficiency have a tight relationship with management of business resources which requires the study of agency theory as well. The agency problem regarding IC management is an existing problem which has not been explored

completely and obviously until nowadays. That is a gap in literature review which remain unexplored regarding the contradictory results. If the "private corporation or firm is simply one form of legal fiction which serves as a nexus for contracting relationships" (Jensen & Meckling 1976, p. 305-311), it is a short step to describe the shareholder - manager relationship as one between "principals and agents", and the structure of the firm as deriving from "an agency conflict between the owner-manager and outside shareholders". (Jensen & Meckling 1976, p. 313) From another approach the agency relationship fits for the relationship between stockholders and manager of the corporation, which is associated with the issue „separation of ownership and control". (Fama & Jensen 1983) Moreover according to Jensen and Meckling „We define an agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent." (Jensen & Meckling p. 308) The first descriptions on the agency-theoretical model of the firm as a legal entity (Jensen & Meckling, 1976) and its legal applications (Easterbrook & Fischel, 1993) were written in a way to avoid the interpretation of shareholders as owners of the firm or the Corporation. From the above detailed we could see the core of the agency problem is that the agent should act on behalf of the principal. Earlier assumption is that the corporate managers are the agents of shareholders and should act in their financial interest. In particular the autonomy granted to managers to organize the business of the company. Both parties, i.e. the principals and agents, seek to maximize their utility. The owners' objective is to increase the value of their shares. The managers tend to increase their remuneration, and are not always acting in accordance with the expectations of their principals, unless they have shares and thus their interests are aligned with shareholders' interests. Jensen & Meckling refer about the generality of the agency problem: „The problem of inducing an "agent" to behave as if he were maximizing the "principal's" welfare is quite general. It exists in all organizations and in all cooperative efforts - at every level of management in firms," in universities, in mutual companies, in cooperatives, in governmental authorities and bureaus, in unions, and in relationships normally classified as agency relation-ships such as are common in the performing arts and the market for real estate." (Jensen & Meckling 1976 p. 309) Among available mechanisms to mitigate the agency problem and reduce information asymmetry between shareholders and managers is to design and implement a corporate governance system. There is a shift in the characteristics of the agency problem when the following two phenomena appear: a substantial proportion of the firm's shares is held by one shareholder and top managerial positions are held by the owners of these shareholders. Morck, Shleifer, and Vishny (1988) explained that these individuals who are majority shareholders and managers at the same time may have enough voting power and influence on their employment with the firm at an attractive salary. The effective corporate governance can decrease the inappropriate consequences of conflict of interest between managers and owners, so the corporate governance has an effect on companies' performance.

### **3. OWNERSHIP STRUCTURE AND COMPANIES' PERFORMANCE**

One of the core issues of corporate governance is the ownership structure and its optimal combination. Jensen (1986) believed that there is an important link between efficiency and indebtedness. He argued that if there is a lack of free cash flows, rather the company chooses to become indebted, it may limit the opportunistic behavior of the managers, who tend to reinvest the excess cash resources even if there is no profitable investment opportunities. He went even further and argued that excess cash resources should be removed from the discretion of managers (and distributed to the shareholders), thereby ensuring greater efficiency. Klapper and Love (2002), proved that appropriate corporate governance has a strong positive influence on the performance efficiency and will increase the market value of companies. On the one hand, empirical evidence suggests that ownership concentration might positively impact on

firm's performance and value (Shleifer and Vishny, 1986; Denis and McConnell, 2003). As a consequence, the most effective mechanisms of corporate governance is ensured by ownership concentration and managerial ownership (La Porta, Lopez-de-Silanes, & Shleifer, 1998). However, agency problems might be noticed among firms with ownership concentration. On the other hand, Gedajlovic and Carney (2010) argue that firms with ownership concentration are disadvantaged in value creation from IC. Moreover some scholars argued, (Greco et al., 2014; Miller and Le Breton-Miller, 2006; Westhead and Howorth, 2006) ownership concentration may block the entrance of highly qualified and trained managers, due to the lack of willingness to share control. However according to other Scholars (Lemmon and Lins, 2003) agency problems might be solved due to the alignment of interests between owners and managers. Sardo, Zélia Serrasqueiro, (2017) has revealed that ownership concentration and owners' management involvement constrain firms' IC performance. The results of Sardo et al. (2018) has confirmed the above statement. The authors argued that for a greater level of growth opportunities, managers tend to select non-profitable projects, which may be a consequence of the increase of agency problems. Moreover the results revealed that the relationship between ownership concentration and firms' growth opportunities is non-linear. Regarding the ownership structure impact on firms' growth opportunities, results suggested that for high-tech firms, a low ownership concentration brings benefits to the firm, as a more dispersed ownership structure may be an incentive device for managers to act more efficiently due to delegate decision making, which might be more appropriated for uncertain environments. According to our argumentation ownership concentration facilitate managers to invest in non-profitable projects, so ownership concentration has a disadvantage impact on companies' performance, which has a negative effect on IC efficiency as well. Therefore in a dispersed ownership structure -where a foreign ownership appears- the managers behaviour will be influenced by the venture capitalists as the manager intend to meets the venture capitalists expectations which will has a positive effect on IC efficiency. Of course the owner manager knows if the companies performance does not meet the requirements, the venture capitalist will not be interested in to invest more resource in the company.

### **3.1. Managerial ownership and companies' performance**

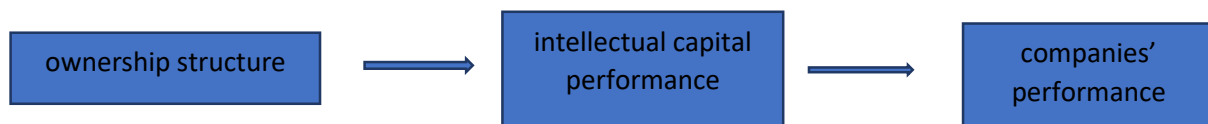
There were some studies (Demsetz & Villalonga, 2001, Jelinek & Stuerke, 2009, Morck et al., 1988, Jelinek & Stuerke, 2009) in the above topic which indicated different results. On one hand studies argued there is non-monotonic relationship between managerial ownership and company performance. (Demsetz & Villalonga, 2001) On the other hand studies found significant and positive connection between managerial ownership and company performance. (Jelinek & Stuerke, 2009) Some studies moreover revealed piecewise-linear relationship between them. (Morck et al., 1988) Morck, Shleifer, and Vishny (1988) studied the linear relationship between managerial ownership and performance on a sample of 371 U.S. companies in 1980, and they found a significant non-monotonic relationship between the variables.

## **4. OWNERSHIP AND INTELLECTUAL CAPITAL**

In recent years intellectual capitals have been gaining importance in corporate governance and are considered as an integral part when assessing the value of a corporation. Thus, it appears that the ownership structure i.e., the type of ownership governing the companies can have influence on performance of intellectual capital of companies and on the change strategy of organizations to achieve more effective performance in intellectual capital. In the knowledge economy, IC, because of its changeable and wide- ranging dynamic nature, has become the main mechanism in a company's capacity to stand out from its competitors (Edvinsson and Malone, 1997; Sveiby, 1997; Stewart, 1999; Bontis, 2000; Jardon and Martos, 2012; Jordão et

al., 2013; Andreeva and Garanina, 2016) because the knowledge assets affect the firm's long-term competitive advantage and value creation (Lev, 2001, 2004; Cabello-Medina et al., 2011). Furthermore, IC is an important resource for firm's innovations and human development through knowledge share (European Commission, 2010, 2013; Nonaka and Takeuchi, 1995). There is a common view in literature on the ability of intangible factors to generate a company's value and distinctive competitive advantages (Bontis, 1996; Marr et al., 2003; Roos, 2017). For instance in Sullivan's (2000) opinion, intellectual capital is a special category of information that can be turned into profit. From another viewpoint intellectual capital is a tacit organizational resource that does not appear in traditional reporting, but today it can be used as a tool for assessing the hidden value of a firm (Chu et al. 2006). In the view of an increasing usefulness of intangible resources for companies and general economy, researchers have proposed several methodological frameworks and empirical investigations for evaluating IC elements and their economic effects (Marr et al., 2003) Also Marr (2004) showed that intellectual capital is the prime value driver in knowledge-based firms and intellectual capital represents a critical knowledge factor to enhance and support continuous performance improvement in an organization (Marr and Schiuma 2001). Thus in all systems of governance, intellectual capital is critical to the performance of the firm and special attention has to be paid to it, because it transforms the relatively tangible financial and physical capitals into added value. (Keenan and Aggestam 2001). Therefore governing ownership type can influence intellectual capital performance, so organizational strategy highly required in value creation. Knowledge management (KM) has a crucial role in managing IC to achieve innovation and financial performance. It is really important to take into consideration managerial ownership and foreign ownership in value creation as well, as they could have different effect on intellectual capital management. KM literature focuses on managerial activities for dealing with organizational intangibles (Kianto et al., 2014). While IC emphasizes knowledge-based resources and their different forms, KM concentrates on how IC elements should be managed efficiently to contribute in the value creation processes (Hsu and Sabherwal, 2012; Wiig, 1997; Kianto et al., 2014; Wang et al., 2016). That is the point where the ownership structure has important role, as foreign ownership as venture capital has positive effect on intellectual capital management, but managerial ownership has a decreasing effect on it. According to Cabrilo and Dahms (2018) IC is static and KM is needed to operate and manage these intangibles to be able to create and maintain value. So KM practices and business strategy can improve competitive advantage and have an effect on firms performance. That means managers actions are required to manage IC elements to achieve growth. By managing intellectual capital there is a relationship between managerial actions on intangibles and the impact on value creation, but the effects of managerial actions are uncertain. Montemari and Nielsen (2013) made a contribution to the intellectual capital measurement literature by showing how to obtain additional information on the dynamics of intellectual capital in order to improve manageability of it and, as a consequence, its contribution to value creation. They did not mention the agency problem at this time, namely the managers action has an impact on IC value creation capability. In our viewpoint this is the main point which has to be examined, how the managerial ownership and managerial behaviour effect the intellectual capital performance. As manager's has the most important role in knowledge management, it has to be revealed, how can managers be incited to evoke more intellectual capital efficiency. The difficulties in evaluating IC investments increase agency costs due to the information asymmetry between the firm and the external investors (Aboody and Lev, 2000; Lev, 2004; Lev and Zambon, 2003). IC literature explores intangibles from a static perspective whereas KM literature focuses on managerial activities for dealing with organizational intangibles (Kianto et al., 2014). Keenan and Aggestam (2001) claim that the relationship between corporate governance and IC has not been studied in the past and Celenza and Rossi (2013) argued, especially the association between

intellectual capital and ownership structure was little examined. This is the area which has to be extended and explore how managerial behaviors effects the intellectual capital efficiency, which means ownership structure and corporate governance examination is highly required to enhance firm performance and intellectual capital efficiency. In order to have more information about the manager's performance, the relationship between the company's performance of intellectual capital and ownership structure needs to be explored, because it facilitates the company's intellectual capital management and thereby it can improve the company's performance. We intend to examine the managerial and foreign ownership concerning ownership structure. For the purposes of this paper, the Pulic model will be used. In this model, the Value Added Intellectual Coefficient (VAIC<sup>TM</sup>) is used to measure the intellectual capital of companies. Pulic (2000, 2004) introduced Value Added Intellectual capital (VAIC<sup>TM</sup>) as a measure for value creation of firms in a knowledge-based economy. Their purpose for developing this measure was the change in the value creation process of firms and the increasing recognition of the role of knowledge and intellectual capital in improving firms' performance.



*Figure 1: Conceptual framework*

Kumar (2004) has divided ownership into two levels of private and institutional ownership, and private ownership is divided further into three types of corporate, managerial and foreign investors. In this research only private ownership in which foreign and managerial ownership will be considered. Private Ownership: includes corporate, managerial, and foreign investors who are confronted with institutional investors. The classification has been selected from research of Kumar (2004). Foreign ownership: it is the total percentage of shares held by institutions and foreign investors out of the total equity shares. This variable is used with the same definition in earlier studies (Kumar, 2004; Aydin et al., 2007; Imam & Malik, 2007). Managerial ownership: it is the total percentage of shares owned by board of directors. This variable is used with the same definition in earlier studies (Kumar, 2004; Rose, 2005). There were some previous study regarding the relationship between managerial ownership or ownership concentration and company performance and ICE (Celenza & Rossi, 2013; Tsai, Yu, & Wen, 2013) Celenza & Rossi, 2013 revealed the lack of relationship between the efficiency of IC and the performance of the companies. In our opinion intellectual capital efficiency has a significant effect on companies performance. The more is the efficiency of the intellectual capital the most value can be generated for the company. Some of these researches concerned the relationship between ICE and managerial ownership (Bohdanowicz & Urbanek, 2013; Saleh, Rahman, & Hassan, 2009), which examined by us as well. Kumar (2004) has revealed there is a non-linear relationship between managerial ownership and company's performance. Furthermore, foreign ownership has no significant influence on performance. Contradictory, we argue venture capital, as a foreign ownership has a positive effect on performance, as foreign investors enhance corporate governance activity which has a crucial role in companies performance. Imam and Malik (2007) utilized the relationship between ownership structure as measure criterion for corporate governance and company performance. We agree on this result, as ownership structure has an influence on corporate governance, which has an important role in value creation process of companies'. Saleh, Rahman, & Hassan (2009) but they realised that foreign and managerial ownership have a positive impact on performance of intellectual capital.

Contradictory with the above mentined results we argue managerial ownership has a negative impact on intellectual capital, but foreign ownership effects positively intelceltual capital performance and in such way companies performance.

## 5. CONCLUSION

As we have seen, intellectual capital provides a completely new model for assessing the real value of organizations and for calculating the future value of companies. In fact, in the current knowledge-based societies the efficiency of intellectual capital means much more than the efficiency of financial capital which has been used and taken into consideration (Bontis et al., 2000). As a result, the companies, shareholders, and other stakeholder groups have become more interested in measuring the true value of intellectual capital than ever. Generally, policymakers and managers can implement effective firm-related strategies and thereby increase the wealth of shareholders if they are aware of the link between ownership structure and intellectual capital performance. Moreover, it can help investors and shareholders in decision-making about gaining more profit. In this search the ownership structure was examined in forms of managerial and foreign ownership. This study confirms that ownership types are certainly an important consideration in building firm-specific capabilities for improving ICE by integrating the agency theory perspectives. Managerial ownership has a negative and significant relationship to intellectual capital efficiency. The reason behind this is that managerial owners seek to increase their personal interests and by decreasing the investments will cause the capital value of company to decrease in long term which as a result has a negative impact on performance of intellectual capital. Venture capital as a foreign ownership has a positive effect on intellectual capital efficiency, since foreign investors are looking for maximalization of profits, moreover foreign investors by long-term investments make the company benefit more in future; which in long-term will bring about competitive advantages and will result in higher efficiency. Finally our general conclusion that there is a significant relationship between ownership structure of companies and their performance of intellectual capital. The results of the theoretical study will be tested by empirical research, which results will be published in a next paper. The findings of this study suggest new direction for the future research, namely future work should widen the measurement of intellectual capital to other economies in order to further develop our understanding on intellectual capital efficiency of firms in emerging economies from an ownership and corporate governance perspective.

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## GAME DYNAMICS AND THE WAR BETWEEN SOCIAL PLATFORMS

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### **ABSTRACT**

*Due to the globalization which generated a towering competitive environment, businesses are seeking for a creative and effective strategy to succeed. Gamification is advertised as an engaging and motivating technique for end-users, customers, patients and learners. Also, social platforms and the role of maintaining lively the company image and brand are increasing its importance. Due to limited research regarding the gamification impact on consumer behaviour, this study aims to investigate and identify the differences between customers who purchase via Facebook and Instagram when factors, such as game dynamics, are considered. For the research purpose, the independent sample t-test has been performed by using SPSS version 23 and the eta-squared and Cohen's d coefficient has been calculated manually. The results reveal that consumers who purchase via Facebook and Instagram differ regarding the feeling of belonging, advancement and expressiveness induced while purchasing. This research provides insights on the differences regarding social platforms' usage if game dynamics are considered and it enriches the current literature regarding gamification, social platforms' usage and online consumer behaviour. However, further investigation is needed to generalize the results. **Keywords:** game dynamics, Facebook, Instagram, online buying behaviour, social media, user behaviour*

### **1. FIRST LEVEL - INTRODUCTION**

Investigating, mastering customer preferences and understanding customer experience strengthen the company chances for success and developing strategy based on customer preferences. After all, whether customers purchase products/services online or offline nevertheless a need, desire, want must be fulfilled and a process which requires a great attention. Social platform as a platform which facilitates doing business is getting considerable attention in recent years. Presently, a great number of social media users utilize social platforms as a channel to communicate, share thoughts and opinions with friends. The identical approach may be applied by the company to communicate directly with customers, suggest strategy, promote products/services and a platform where the customer can share their thoughts and opinions (Di Pietro & Pantano, 2012). Hence, social media simplifies and assists companies by directly contacting customers and provide information regarding products/services along with boosting the productivity and performance of marketing strategy. The game design is defined as the process of adding game elements to create meaningful consequential action.

In order to identify and integrate the game elements in non-game context by facilitating the process of creating a structure and to understand gamified activities the MDA (game mechanics, game dynamics and aesthetics) framework has been designed (Mora, Riera, González, & Arnedo-Moreno, 2017). However, to distinguish the game element usage in the game and non-game context is employed gamification as an explanatory term. Furthermore, gamification is the utilization of game elements designed for people, end-users, students, consumers, patients to engage, motivate, promote and solve issues (Kapp, Blair, & Mesch, 2013). The importance of studying game dynamics is due to its role. Game dynamics are crucial to stimulate, motivate and evoke positive emotions to end-users, players, learners and consumers. Also, designed to induce active and interactive engagement, influence and appeal the occurrence of behaviour, increase collaborative socialisation, boosts the engagement and activate participation (Tu, Yen, Sujo-Montes, & Roberts, 2015). The aim of this paper is twofold. Firstly, to investigate the differences between Facebook and Instagram users as marketplace to purchase by following MDA Framework when game dynamics are considered. Secondly, five statements containing game dynamics elements have been designed in order to identify and evaluate the differences between customer who purchase via social platforms such as Facebook and Instagram. The globalization of business is encouraging scholars to provide new evidence regarding the influence of gamification in online consumer behaviour. To authors' knowledge previous research has been conducted in terms of identifying the influential online purchasing factors, but the research regards game dynamics differences is very limited. Thus, this research has been conducted to dwindle the gap in theoretical scope by enriching the current literature and providing insights regarding dissimilarities of game dynamics in online consumer behaviour.

## **2. SECOND LEVEL - LITERATURE REVIEW**

Social commerce and social platforms are growing its usage. Concerning the differences between social media user and non-users, Reisenwitz (2013) confirm that non-social platforms users are less likely to be innovative, risk taker and loyal to the brand, than social platforms users. Despite all the facilitating conditions and benefits consumers are able to obtain price consciousness is ranked as the significant factor impacting online purchasing intention (Riorini, 2018). In Eastern Slovakia, consumers are not influenced by social media advertisement nor by the tools such as website/e-shop which assume to be presented as competitive advantage of retailers (Bačík, Gavurova, & Gburová, 2017) but the consumers in Taiwan are affected by social influence when is mention brand attitudes and advertisement influence consumer brand attitudes and purchasing intention (Yang, 2012). The purchasing behaviour of young Indian consumers differs in gender and personality (Mishra & Ayatham, 2017) and for online purchasing intention, the influential factors are likes, friend likes, comment posting, location based check-in, sharing, and friend comment (Venugopal, Aswini Priya, Sathish, & Anjani Devi, 2018). According to Boon-Long and Wongsurawat (2015), the Thai consumers purchasing decision is influenced by usage experience issues, information requests, business practice issues, product launches and developments. Americans are concerned with privacy issues and influenced by the same factor toward purchase intention (Lin & Kim, 2016). However, Indonesian consumers are price sensitive and is a significant influential factors towards purchasing intention (Riorini, 2018). While the consumers, Italian consumers, on the other side of the world are significantly affected by eWOM communication and enjoyment towards purchasing intention (Di Pietro & Pantano, 2013). Regarding factors impacting Instagram users purchasing intention are social presence and trust (Pratama, Meiyanti, Noprisson, Ramadhan, & Hidayanto, 2017) along with e-WOM (Danniswara, Sandhyaduhita, & Munajat, 2017; Prasertsith, Kanthawongs, & Kanthawongs, 2015; Yunus, Md Ariff, Mohd Som, Zakuan, & Sulaiman, 2016). Consumers intention towards engagement and purchasing via Facebook retailers are impacted by communication with other consumers, compatibility,

credibility (Bianchi & Andrews, 2018), trust (Escobar-Rodríguez, Grávalos-Gastaminza, & Pérez-Calañas, 2017) and enjoyment (Di Pietro & Pantano, 2012). Despite the influential factors which impact consumer purchasing intention and purchasing decision the differences between the countries and cultures are substantial. Malaysian consumers of Generation Y who purchase via Facebook obtained a significant relationship between relational benefits and relationship commitment. Although the impact of satisfaction on the relationship between relational benefits and relationship commitment appeared to be unimportant (Radzi, Harun, Ramayah, Kassim, & Lily, 2018). The influential factors for Spanish and Portuguese consumers who purchase via Facebook are perceived usefulness, social influence, and the attitude to Facebook, however, the perceived ease of use resulted to be unimportant (Miranda, Rubio, Chamorro, & Loureiro, 2014). Facebook purchasers consider friends who share information and recommend products as influencer towards purchase intention (Wang & Chang, 2013). According to Rahman et al. (2018), fanpage engagement resulted to influence consumers towards purchasing intention. The mentioned factors such as social identity, information, recognition, structure and interaction influenced perceived usefulness and perceived ease of use for the Taiwanese attractions industry consumers. Also, when measuring the impact of perceived usefulness and perceived ease of use on actual usage, the relation between perceived ease of use and actual usage resulted to be direct (Fotiadis & Stylos, 2017). According to Mahrous and Abdelmaaboud (2017), the online brand community is impacted by extrinsic motivation, usability, sociability and emotional trust, however, the mentioned factors do not influence a consumer purchasing decision. In the same line, Sun et al. (2017) findings imply that at Facebook friends impact is respectably by consumers, although in Amazon friends are influencers of co-purchasing behaviour. The appliance of gamification in classroom assisted students to surpass the current results by meliorating access the system, increasing the amount of written and submitted assignments and upgrading the quality (Tenorio, Ibert Bittencourt, Isotani, Pedro, & Ospina, 2016). Likewise, in the educational domain Hamari et al. (2018) findings revealed that users preferences concerning motivation in design classes are associated with goal design and attributes. From students' perspective game elements which impact in the educational domain are team work, restrictions, narrative, challenges (leaderboard, reward, badge, points) and win-state (Aldemir, Celik, & Kaplan, 2018). Concerning the impact of gamified lectures significant enhancements have been noticing in the level of interest, innovative education and motivation (Cózar-Gutiérrez & Sáez-López, 2016). Game dynamics are defined as an answer of the action which is performed, felt, experienced by the player while interacting with the game. Along with all game elements, game dynamics are expected to motivate, entertain, and evoke emotion within the player (Thiebes, Lins, & Basten, 2014). Although game dynamics are one of the MDA Framework, Tu et al. (2015) suggests combining game dynamics with gamification contexts, gaming personalities or preferences, dynamic gaming engagement styles by creating a powerful association within the elements in order to design impactful gamification. To fill the gap in the theoretical scope the following hypothesis have been designed:

- H1: The differences between feeling as making a big step and the social platform utilized for shopping are significant.
- H2: The differences between being aware of the high number of consumers interested in the same product and social platform utilized for shopping are significant.
- H3: The social status consumers feel belonging to, differs regarding the social platform utilized when shopping.
- H4: Depleting creativity when shopping differs based on the social platform utilized when purchasing.
- H5: Considering shopping as a personal and individual experience differs based on the social platform utilized when purchasing.

### 3. THIRD LEVEL - METHODOLOGY

The questionnaire was distributed in Kosovo. Firstly, it was designed and adjusted to Kosovo citizens. Secondly, the questionnaire was tested with a small sample and afterwards distributed in all cities of Kosovo. Moreover, five statement related to game dynamics included game elements from the MDA framework (Kim & Lee, 2015). Each item was measured with a five-point Likert scale whose answer choice ranges from 1-Strongly disagree, 2-Disagree, 3-Neutral, 4-Agree to 5-Strongly agree. After gathering the data from all cities in Kosovo, 146 questionnaires were qualified for further analyses. The responses were analysed by using SPSS version 23. The independent sample t-test also known for short as sample t-test was chosen as the statistical technique to analyse the data. The test is part of the parametric test group, due to defining properties, assumptions and is employed to compare groups. As a parametric test, the sample t-test will allow the authors to test the hypothesis regarding the population parameter. Other reasons for choosing the sample t-test is the sample size which is not necessary to be large, provides all the necessary information about the population in terms of the confidence intervals and parameters and above all is a very powerful test due to its statistical power. Furthermore, the sample t-test is employed when interested to identify the statistically significant difference in the mean scores for different (independent) groups (Pallant, 2007). The Cohen's *d* coefficient has been used to measure the effect size, which is measured with values from 0 to 1 (if 0.2=small effect, 0.5=medium effect, and 0.8=large effect). The formula to calculate Cohen's *d* coefficient is (Cohen, 1988, p. 20–2.2.1):

$$d = \frac{m_A - m_B}{\sigma} \quad (1)$$

where:

*d* = is the index for tests of means in a standard unit,

*m<sub>A</sub>*, *m<sub>B</sub>* = population means expressed in raw, and

*σ* = the standard deviation of either population.

Regarding the measurement of effect size correlation is employed *eta-squared*, which is calculated with the following formula (Cohen, 1988, pp. 284–7):

$$eta\ squared = \frac{t^2}{t^2 + (N_1 + N_2 - 2)} \quad (2)$$

According to the Cohen rule of thumb, *eta squared* is interpreted based on its value gained after calculation. If *eta squared*~0.01, means that the effect is small and explains 1% of the total variance. When *eta squared*~0.06 the effect is moderated and explains 9% of the total variance. And, when *eta squared*~0.14 the effect is large and explains 25% of the variance.

Table 6: The game dynamics statements

Dimension	Item	Survey statement
Game dynamics	DY01	I felt like I am making a big step in my life while shopping via social media
	DY02	It's important to see a high number of consumers wanting the same products as I
	DY03	I felt like I have reached a high social status while I am shopping via social media
	DY04	Shopping via social media allows me to deplete my creativity
	DY05	I consider shopping via social media as a personalized and individual process

Source: Authors' development

To perform the independent sample t-test has been followed all the standard procedures. Also, all the criteria have been fulfilled, the test contains one categorical, independent variable and one continuous, dependent variable (Pallant, 2007). Afterwards, the Sig. value of Levene's Test for equality of variances was larger than 0.05 which did not violate the assumption of equal variance and allow to use the first line of the SPSS output which was equal variances assumed. To report the significant differences between the groups the column labelled Sig. (2-tailed) has been referred, which is depicted in Table 2 in the column named as p-value. Furthermore, the test has been performed using the 95% confidence interval of the difference. Lastly, since SPSS version 23 did not provide information regarding the effect size statistics for t-test the *eta-squared* and Cohen's *d* coefficient has been calculated manually using the first and the second formulas and the results of SPSS output.

#### 4. FOURTH LEVEL - RESULTS AND DISCUSSION

The questionnaire used for this research, has been designed in English and afterwards translated in the Albanian language. The research has been conducted in the Republic of Kosovo. Based on the Kosovo Agency of Statistics (2018) report in Kosovo live almost 1.8 million inhabitants. On the report presented by Internet World Stats (2017) in Kosovo are approximately 910 thousand Facebook penetrators. Although the report of Hallakate<sup>1</sup> (2017) present one million Facebook active users and 580 thousand Instagram users in Kosovo. To be able to generalize the results for Kosovars the respondents have been recorded from all around Kosovo. It was distributed during September 2018 in different groups of social platforms and all group members were invited to voluntarily complete the questionnaire. In order to be part of the survey, members had at least once to purchase via Facebook or Instagram. Followed by a previous pilot test completed by 50 respondents, where the answer has been added to the final database, 146 respondents took part whither 57% Facebook users and 43% Instagram users purchased products/services via the mentioned social platforms. The results of independent sample t-test comparing Facebook and Instagram as social platforms for purchasing when game dynamics are considered have been summarized in Table 2. The first statement allowed consumers to state their level of agreement regarding when shopping via social platforms consumers felt as if they are making a big step while purchasing products/services via social media. According to the results, the differences between different for Facebook ( $M=2.60$ ,  $SD=1.239$ ) and Instagram ( $M=1.95$ ,  $SD=1.084$ ,  $t(144)=3.31$ ,  $p=.001$ ) users are significant. The magnitude of the difference in the means was moderated and contain a practical/clinical effect ( $d=.56$ ,  $\eta^2=.071$ ). The second statement, where being aware that a high number of consumers are interested in the same product/service is not significantly different for Facebook ( $M=3.18$ ,  $SD=1.251$ ) and Instagram ( $M=3.29$ ,  $SD=1.349$ ,  $t(144)=-.486$ ,  $p=.628$ ). The magnitude of the difference in the means resulted without effect ( $d=.09$ ,  $\eta^2=.001$ ). Feeling like reaching a higher social status while purchasing via Facebook ( $M=2.41$ ,  $SD=1.210$ ) and Instagram ( $M=1.84$ ,  $SD=1.019$ ,  $t(144)=3.005$ ,  $p=.003$ ) are statistically significant. The magnitude of the difference in the means was moderated with a practical/clinical effect ( $d=.51$ ,  $\eta^2=.059$ ). The third statement resulted that depleting the creativity consumers obtain while shopping via social media and the usage of social platforms such as Facebook ( $M=2.80$ ,  $SD=1.286$ ) and Instagram ( $M=2.32$ ,  $SD=1.342$ ,  $t(144)=2.182$ ,  $p=.031$ ) are statistically significant. The magnitude of the difference in the means had a slight effect ( $d=.37$ ,  $\eta^2=.032$ ). Lastly, consumers were asked to state their level of agreement towards considering the purchasing process via Facebook ( $M=3.31$ ,  $SD=1.157$ ) and Instagram ( $M=3.11$ ,  $SD=1.220$ ,  $t(144)=1.021$ ,  $p=.309$ ) as personal and individual, and the results reveal that the difference is not significant. The magnitude of the difference in the means resulted without effect ( $d=.17$ ,  $\eta^2=.007$ ).

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<sup>1</sup> Hallakate is a private social media agency

*Table 7: Summary of independent sample t-test results of game dynamics*

	Facebook		Instagram		t(144)	p-value	Cohen's d	eta squared
	M	SD	M	SD				
<b>DY01</b>	2.60	1.239	1.95	1.084	3.311	.001	.56	.071
<b>DY02</b>	3.18	1.251	3.29	1.349	-.486	.628	.09	.001
<b>DY03</b>	2.41	1.210	1.84	1.019	3.005	.003	.51	.059
<b>DY04</b>	2.80	1.286	2.32	1.342	2.182	.031	.37	.032
<b>DY05</b>	3.31	1.157	3.11	1.220	1.021	.309	.17	.007

*Source: Authors' results*

The present study contributes to and enhance the theoretical and empirical understanding regarding the dissimilarities between social platforms when game dynamics are examined. Moreover, throughout this investigation of game dynamics, the study has also contributed to extend the understanding of game dynamics elements appliance in online buying behaviour. The outcome of independent sample t-test as a parametric test allowed testing of the hypothesis established at the beginning of this research. According to the results, insufficient evidences were presented to support the H2 and H5. Namely, Facebook and Instagram users do not differ regarding competitiveness and personalizing the purchasing process. The World Bank report (2018) ranked Kosovo as a poor country where the GDP per capita is less than 5 USD, hence, customers are sensitive to the prices are mostly purchase the needed products/services regardless the number of interested consumers for the products/services and brands. On the other hand, the results support H1, H3 and H4. Which allows to generalize the dissimilarities between Facebook and Instagram users in three dimensions of feelings. The differences lie on the feeling of belonging, advancement and expressiveness induced while purchasing via social platforms. Evidently, the social platforms evoke different feelings within consumers while shopping. Although the mean of Facebook users is higher than Instagram users, except for one statement, the degree of differences within the means is generally powerless. Due to lack of study regarding online buying behaviour when game dynamics are taken into consideration the authors were unable to compare the results.

## 5. FINISH - CONCLUSION

Employing gamification in social platforms, if used and designed accurately, may assist companies in creating a sustainable relationship with costumer by making shopping an exciting, interesting and enjoyable activity aiming to increase consumer satisfaction and engagement. Based on earlier studies regarding gamification, this research conducted an analyse by employing game dynamics to investigate the differences between Facebook and Instagram users. Findings reveal attractive findings by depicting unique characteristics of the Kosovars consumers, the country where the study was conducted. The differences between consumers who purchase via Facebook and Instagram are associated with the feeling of belonging, advancement and expressiveness. This study provides evidence which enriches the current literature regarding game dynamics, social platforms' usage and online consumer behaviour. For researchers, this study may be considered as a foundation for further investigation regarding gamification, game dynamics, for further research on online buying behaviour and gamification impact. For practitioners, understanding the key constructs is crucial to design and refine the game dynamics that assists business to achieve high consumer acceptance and value, and with the right amount of game techniques within. The potential limitations of this study are the sample size, employing limited game elements, and the impact of each game element in consumer behaviour which invites researchers for further examination and additional research. The study is biased towards users, rather than nonusers. The respondents were only from Kosovo and the comparison is only between Facebook and Instagram, therefore, is impossible to generalize the finding for all developing countries and social platforms.



Research should be replicated to examine the findings across different cultures, countries, environment, technology, social platforms, and individuals. Further research when employing additionally game elements and moderators may lead to interesting results. Also, comparing the game experience and its relationship with online buying behaviour when game elements are employed may be a fruitful direction for further research.

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# THE EUROPEAN INVESTMENT BANK IN A TURBULENT ENVIRONMENT: SEEN THROUGH ITS EVER-DEVELOPING BUSINESS MODEL

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## ABSTRACT

*Since its foundation in 1957, the European Investment Bank (EIB), the primary financial arm of the European Union (EU), has become the world's largest multilateral bank, with its operations undergoing progressive international expansion. It is being increasingly solicited by the EU to promote economic recovery against the backdrop of the recent economic difficulties of a crisis-ridden, turbulent economic environment. Existing scholarly work on the EIB is disproportionately limited when compared to its expansive role, and this work mostly comprises analyses of its past activities. This paper instead studies the EIB's ability to maintain its vocation of financing viable projects that promote European objectives in the present and future economic environment. The paper also examines the EIB's current business model (BM) and evaluates the possibilities it offers in addressing current and future global economic needs in the European Union (EU) and beyond, with appropriate and adequate financial services. BMs contain the structure, modus operandi and fundamental activities of an organisation, thus rendering them a useful tool with which to examine organisations. BMs enable organisations to create value and appropriate a share of that value. As the EIB's BM is not publicly available, this paper presents a purposefully developed BM that is based on the EIB's business fundamentals of its publicly available legal documents. The developed BM reflects the EIB's dual nature as an EU institution and bank. The paper posits that the current EIB is well conceived, robust and flexible, allowing the EIB to fulfil its remit by addressing major economic and social concerns and acting in a countercyclical mode in the crisis-ridden, turbulent environment of today. Furthermore, through the study of its current BM, the paper attempts to explain how and why the EIB's activities have been supported, and expects a BM revision triggered by the departure of Great Britain, one of the four large EIB shareholder's, entailed by the country's decision to leave the EU.*

**Keywords:** *Business Model, European Investment Bank (EIB), Institutional Governance*

## 1. INTRODUCTION

The European Investment Bank (EIB), the primary financial arm of the European Union (EU), adopted a central role at the outset of the EU's economic crisis in 2008. Since then, it has been called upon to act in a countercyclical economic mode. It has also endeavoured to increase its lending to stimulate and support the EU's endeavours for smart, sustainable and inclusive economic growth. In this context, the EIB has recently become a subject of interest within the academic community. However, this interest is still rather anaemic compared to the bank's economic and political strengths, and it mainly focuses on the EIB's financing past activities (Coppolaro, 2010; Fedele et al., 2010; Marzinotto, 2011; Clifton et al., 2014; Pistoia, 2014; Anghel et al., 2016; Clifton et al., 2018; Liebe and Howarth, 2019). This paper attempts to complement existing scholarly work by examining the EIB and addressing the following research questions: Was the EIB's role in the 2008 economic crisis within its remit? What enabled the EIB to act in a countercyclical mode? How can the EIB satisfy economic needs in the crisis-ridden, turbulent environment of today? The paper follows a Poppeian approach and examines the EIB as an institution and its policies and practices as trial solutions to the

prevailing economic and social problems of low growth and unemployment, climate change, and low EU competitiveness in a globalized context. In relation to the analysis, the paper addresses the research questions in a novel way, through an appraisal of the EIB's current business model (BM). BMs report on how organisations create and deliver value; as such, they can be viewed as a means to investigate how an organisation formulates its remit and subsequently puts it into practice. Due to their representational nature, BMs assist organisations in achieving strategic alignment and constitute their visual blueprint, reflecting their business fundamentals, strategic choices and operating implications. Parallel to this, they also allow for the interplay between organisations and their environment (Calvante et al., 2011; Jihson et al., 2008; Osterwalder, 2004; Zott et al., 2011). However, the EIB's BM is not in the public domain. Although the BM is often referred to by EIB officials, it is typically in the form of short verbal descriptions that are mainly associated with the bank's triple-A credit rating as mentioned by its president Maystadt (EIB.AR, 2010) and others (Szymczak, 2010; EIB.AR, 2011; Camdessus, 2010). Only recently has this been diversified and referred to as the 'EIB's financial model' (Hoyer, 2019, p. 18). The paper presents the EIB's BM, which has been purposefully crafted for the purposes of this research based exclusively on EIB publicly available information, based on the basis of a hybrid archetype devised to reflect EIB's dual nature as an EU institution and bank. This hybrid archetype is based on an existing proposal for an archetype model (Johnson et al., 2008) and is coupled with inspirations from an affinity diagram of BM of all components appearing in various archetypes (Schafer et al., 2005). The proposed here new hybrid archetype consists of four primary interlocking elements, which, when taken together, create and deliver value. These elements are presented below.

- a) Strategic choices: This is the most important of the four elements, as it describes the organisation's core logic and *raison d'être*. Once the *raison d'être* is established, the remaining elements can be designed to serve it. This element includes the organisation's identity parameters, mission, offering, scope, target market and core differentiation from competitors.
- b) Value capture: This refers to the organisation's capabilities and competencies that allow it to secure the necessary resources to ensure its viability. This element encompasses resourcefulness through funding, efficiency through reduced cost margins, resilience in maintaining asset quality over time, effectiveness through serving the organisation's mission and objectives and avoiding the waste of organisational resources by doing the wrong thing;
- c) Value creation: This refers to the ways in which the organisation delivers its value proposition to the beneficiary or client. This element comprises various parameters, including ways in which to enter the market, ways of addressing market needs, sourcing pricing and positional advantages, ensuring autonomy in responsible decision-making and maintaining credibility.
- d) Value network: This pertains to the support network that allows an organisation to formulate its strategic decisions and create as well as capture value. This element encompasses stakeholders, alliances, branding and product flow.

This specially crafted hybrid BM has been edited to comprise the EIB's business fundamentals, which are contained in its statute and available in the public domain. The EIB's business fundamentals form an integral aspect of various EU treaties. Using a historical institutional approach, a review of previous EIB statutes revealed the main turning points in the EIB's evolution, resulting in the revision of its BM. Two major revisions were identified in 1999 and 2010, driven by policy and market developments and largely associated with the introduction of the euro and the difficult economic environment of the EU.

The current EIB BM has been tested against the EIB's annual results and performance, which is based on its annual activity, financial and statistical reports. The paper posits that the current EIB is well conceived, robust and flexible. This allows the EIB to fulfil its remit by addressing major economic and social concerns and acting in a countercyclical mode in the crisis-ridden, turbulent environment of today. Furthermore, through the study of its current BM, the paper attempts to explain how and why the EIB's activities have been supported. The scientific contribution of the study is twofold: First, it has devised a new BM archetype suitable for multilateral development banks (MDBs) and non-profit organisations. Second, it has developed a novel approach to understand organisations through the use of BMs. The remainder of the paper is organised as follows: Section two presents the current EIB BM and analyses the EIB's BM activity in the EU over the past eight years – years that have been marked by crises. The conclusion briefly summarises the main elements of the EIB's current BM and estimates its future validity.

## **2. FROM A POLICY BANK TO A CROWDING-IN BANK**

The EIB's current BM has been in use since 2010.<sup>1</sup> Although the year of its revision coincides with the apex of the economic crisis in the EU, its creation has been as a result of previous deliberations at senior levels of the EU and EIB. These deliberations consolidated and built on the EIB's 1999 BM. The latter, due to its flexibility, enabled the bank to develop from a mono-intense activity (Clifton et al., 2014; 2018) to a multi-intense activity for smart, sustainable and inclusive growth. The EIB's 1999 BM constituted the first revision of its BM since its establishment in 1957. The revision was deemed necessary in view of the market changes in the run-up to the euro; at this time, the market was characterised by increased financial competition in the enlarged and liquid capital markets of the common euro, limited public finance for investments (due to the Maastricht criteria) and investment levels that were below established targets. These conditions meant that the EIB had to maintain its relevance by remaining useful to the EU, which needed investment. However, the bank could no longer expect high lending volumes from publicly financed infrastructure projects, and increasing their lending to the private sector was not easy, as the EIB's interest rates were no longer hugely attractive to the private sector. At this time, the private sector could directly tap into the vast and liquid euro capital markets while the single currency left few possibilities for the EIB to lower their rates due to arbitrage. Against this backdrop, the EIB's BM has been revised in relation to all four of its elements. Changes in the EIB's 2010 BM have been introduced in an incremental way, building upon and adding on the 1999 BM. These additions are presented below (Chart 1). Changes in strategic choices have mainly been supported by the elements of value capture and value network. Although the EIB's offerings remained predominantly focused on lending, to address the needs of the private sector, they turned to increased leverage through so-called special activities. Some of these activities focused on risk capital and structured finance. The EIB also blended its own funds with sources from the EU Commission, upgrading the role of the EIF, the EIB's venture capital subsidiary, for coherent intra-group finance. As well as this, the EIB developed alternative finance structures, and it institutionalised its long-claimed role of catalyst by deriving further benefits from its human resources through the provision of advisory services. One such advisory service was related to public-private partnerships (PPPs) (Liebe and Howarth, 2019) because of its expertise in the area. This became a method for the EIB to realise infrastructure projects. This activism began during the EIB's 1999 BM, and it led to the creation of the European PPP Expertise Centre (EPEC) in 2008. The EPEC underwent further development during the 2010 BM: It served an increasing number of member organisations, other public entities in charge of PPPs and the European Commission.

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<sup>1</sup> The Statute of the European Investment Bank, 2010.

Building on its value network and strength as a catalyst in large infrastructure financing, the EIB has recently been termed a 'crowding-in bank' by EIB president Werner Hoyer (EIB, 2019, p. 12). These characterisations imply that the bank's experienced and highly qualified staff provide a 'quality shield' for projects through rigorous project appraisals, thus paving the way for commercial banks and other investors to 'crowd in.' This crowding in is due to the fact that a number of risk elements have been properly assessed, and not merely financial risks, but also market, economic, environmental and technological risks. Moreover, the EIB's catalytic role cultivates synergies with other MDBs and IFIs. Partnering with the latter has been increasingly sought, as evidenced by numerous agreements in the form of memoranda of understanding, which are listed on the bank's website. As a consequence, the role brings several benefits to the bank and its counterparts: The EIB can increase its client base, reduce operating costs by sharing project appraisal tasks, decrease its risk in projects and improve asset quality. It can also affirm its relevance by actively seeking the efficient use of public funding provided by MDBs and IFIs. Partnering with commercial banks and national promotional agencies has always been sought after by the EIB: A competitor of commercial banks cannot be financed through public funding. Thus, the EIB has established itself as a complementary source of finance, with its funding limited to 50–75% of total project costs. This funding limit allows other financiers to partake in deals while also sharing the associated risks. Additionally, the banking network has been viewed as a project provider for the EIB; this is because it funds smaller enterprises, direct and indirect loans and guarantee operations for loans provided by commercial banks. The banking sector profits from the commissions and fees of the EIB's international emission programme while using the funding lines of smaller enterprises to finance its treasury. Co-financing with the EIB is a safe business given the latter's rigorous process of due diligence. This symbiotic relationship allowed the EIB to work for some forty years with BMs that did not foresee active client solicitation. With the 1999 BM, however, this changed, and it underwent further development with the 2010 BM. In the current BM, customer and investor relations have been privileged through increased direct contact in the form of road-shows, fora and national and regional conferences. Various communication efforts and deliberate endeavours have also been implemented to create a system of global relations management and a worldwide office network.<sup>2</sup> The EIB's 1999 BM introduced new areas of activity, such as human capital and innovation, as its objectives. These new objectives were in addition to its existing objectives, including economic and social cohesion and an increased focus on energy, the environment and small and medium sized-enterprises (SMEs). The 1999 BM allowed the EIB to support all necessary areas to ensure sustainable, smart and inclusive development well before its revision in 2010. Given its subsequent endorsements by successive European councils, including the Lisbon Agenda in 2000, the European Action for Growth in 2003 and the Europe 2020 Initiative in 2009, the 1999 BM was perceived as successful. However, the EIB's 1999 BM had to be revised within a relatively short period of ten years, as EU investment was not increasing. As a consequence, the EU was caught in a trap of low investment, despite abundant liquidity, when the economic crisis began in 2008. The EIB's 2010 BM built on the strengths of the previous model to improve the bank's competitiveness and relevance. There was a need to go beyond quantitatively increasing the EIB's lending volumes, which had some specular results: EIB lending in the eight-year period of 2010–2017 represented 2.5% of the EU's gross domestic product (GDP) and 10% of the EU's gross fixed capital formation (GFCF).<sup>3</sup> In order to promote smart and inclusive growth, funding in human capital, research and development, climate-change mitigation and innovation have been prioritised.

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<sup>2</sup> From two offices in Brussels and Rome in 1976, the EIB grew to six offices in 1996, seventeen in 2006, thirty-six in 2016 and forty-five in 2017.

<sup>3</sup> In this period, EIB lending averaged roughly 69 million euro; EU GDP averaged 17 trillion euro; EU GFCF funding averaged 650 million euro.

However, investment in these areas poses greater risks and necessitates the adaptation of financial products to ensure its support. Increased risk-taking as well as the sharing of products that the EIB began to test and implement under its 1999 BM have been strengthened in its 2010 BM. This strengthening entailed the qualitative development of the EIB's lending by increasing its leverage (i.e. the multiplier of its lending effect) and impact on new investment creation. The EIB's increased appetite for risk and leverage has carried low intrinsic risk, allowing the EIB to maintain its high credit rating. This can be attributed to the EIB's resourcefulness, efficiency, resilience and effectiveness. These characteristics also demonstrate other key strengths, including:

- a) its extensive shareholder support, as evidenced by its successive increases in capital and the metrics of its 2016 and 2017 risk-management reports;<sup>4</sup>
- b) its strained yet satisfactory capital adequacy due to its high-quality assets;<sup>5</sup>
- c) its low-risk operating environment;<sup>6</sup>
- d) its diverse loan portfolio;
- e) its extensive liquidity policy, which foresees a twelve-month buffer, further strengthened by the EIB's access to the European Central Bank (ECB)'s liquidity facilities, which are quite unique for an MDB<sup>7</sup>;
- f) its prudent risk-management, enhanced by its preferred creditor status (PCS), a rarity in MDBs; and<sup>8,9</sup>
- g) its high-quality assets due to its rigorous process of due diligence.

The above qualitative improvements arose in the EIB's 2010 BM. The latter institutionalised the blending of EU grants with EIB loans for more efficient and effective coordination of the EU's funding of investment projects. The EIB has cooperated and coordinated with the European Commission, its sister institution in terms of policy. The EIB has been working under various Commission mandates in relation to funding inside and outside the EU. This feature is unique among MDBs and has been extended with the revised 2010 BM so as to blend EIB resources at market rates with the Commission's grants to reduce the cost of the funding provided.<sup>10</sup> This allowed the EIB to become even more competitive. It certainly contributed to maintaining its market share during the fiercely competitive euro-euphoria period. Later, during the crisis years, it became an element that permitted the EIB's countercyclical intervention. The institutionalisation of the close cooperation between the EIB and EU also took the form of

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<sup>4</sup> The last capital increase of 10 billion euro was in 2012.

<sup>5</sup> In 2017, the EIB's impaired loans represented 0.3% of its gross loans. The EIB has a stronger capital position than most commercial banks, and its Basel III capital adequacy in 2016 was 26.4%.

<sup>6</sup> EIB lending is primarily concentrated in the EU. Its European loans represented 95% of its outstanding loans at the end of 2017.

<sup>7</sup> The other MDB enjoying access to the regional central bank's refinancing facilities is the Banque Ouest-Africaine de Developpement (BOAD).

<sup>8</sup> 'The EIB shall be exempt from all forms of requisition and expropriation, as enshrined in the EIB Statute, are deemed to guarantee a full recovery of the EU Sovereign Exposures on maturity. This financial protection and the benefit of the preferred creditor status result in zero loss or risk from Member States sovereign exposure or guarantees. However, similarly to other creditors, the EIB is bound by the majority decision based on collective action clauses included in debt instruments issued by EU Sovereigns. When operating outside the EU, the Bank is deemed to enjoy preferential treatment comparable to that of other international financial institutions' (EIB, 2017, p. 6). As an integral aspect of various EU treaties, and having the same legal power as them, the EIB statute has primacy over the national law of EU member states and can be enforced through the EU's Court of Justice.

<sup>9</sup> The EIB's PCS and preferential treatment has been clearly demonstrated in the case of the capital controls in Greece, whereby Greece's temporary arrears were passed to the International Monetary Fund in 2015 while the EIB continued to receive timely servicing of its public loans in the country.

<sup>10</sup> Blending grants and loans addressed to public agencies and local authorities for the production of public goods that do not have cost recovery has a similar effect to interest rate subsidies at net present value, as grants are paid upfront and not over the term of the loan.



various joint initiatives.<sup>11</sup> These initiatives enriched the Commission's technical skills and benefited the EIB by enlarging its customer base, off-balance sheet operations and income from mandates as well as its various management and advisory roles.<sup>12</sup> In 2018, it supported 530 new assignments (EIB, 2019). These two qualitative features revised the EIB's 2010 BM by increasing the multiplicative effect of its lending and enlarging its pipeline of upcoming projects through partnerships and advisory roles, which assisted in the design and setup of bankable project proposals. These features have constituted a springboard for the EIB's increased activity in support of the EU's counter-crisis efforts of recovery and growth. The EIB has received considerable support following the creation of the European Fund for Strategic Investments (EFSI) in 2015. It was created within the framework of the Juncker Investment Plan.<sup>13</sup> Apart from granting higher lending volumes, the EFSI also foresees increased risk-taking and risk-sharing, focusing on particular projects in 'strategic infrastructure, education, Research, Development and Innovation (RDI), renewable energy and resource efficiency, as well as support for SMEs and Midcaps' (EIB, 2016, p. 1). Loans under the EFSI are riskier than the average credit risk of the EIB's portfolio.<sup>14</sup> However, they benefit from a guarantee from the EU, representing 25% of the total amount of loans provided; the equity and mezzanine instruments are also guaranteed by the EU. The EIB will continue to play a leading role in InvestEU, the successor to the Juncker Plan. InvestEU will be based on a guarantee of 38 billion euro from the EU budget, targeted to mobilise 650 billion euro of investment to ensure the EU remains 'social, green and competitive' (EIB, 2019: 1).<sup>15</sup> As riskier loans consume larger areas of capitalisation, the effectiveness and resilience of the EIB's value capture element are adjusted in order to safeguard the bank's relevance, and allowing the EIB to maintain its added value.<sup>16,17</sup> If successful, these loans offer high returns. As shown above, the EIB's strategic choices in 2010 in relation to its BM institutionalised three pillars of activity for the bank – namely, lending, blending and advising for improved leverage of both EU budgetary resources and EIB finance. The three pillars of the 2010 BM allowed the EIB to become varied and develop and test five different lines of business and banking while enjoying flexibility in terms of resources and cost allocation. These banking types comprise wholesale banking for SME-financing, development banking for financing in non-EU countries, for-profit banking for risk-taking and risk-sharing operations, policy banking for the financing of EU priority projects and service

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<sup>11</sup> They allow the partial allocation of the Structural Funds for financial engineering purposes in support of SMEs and micro-enterprises (JEREMIE) or for urban-social development (JESSICA). The third initiative (JASPERS) offers free technical assistance for the identification and implementation of infrastructure projects that are eligible for financing from the Structural Funds (AR2006).

<sup>12</sup> Off-balance sheet operations began in 1964 with lending outside the EU, and in 2016 included twenty-six different items. Constantly zero from its establishment until 1976, the fee income increased to 2,794,000 in 1976. In 1986 it rose to 15,033,000, and in 1996 it rose to 16,053,000. It reached 53,443,000 in 2006 and 180,451,000 in 2016 (EIB.AR, 1964; EIB.AR, 2016).

<sup>13</sup> Further to a decision by the European Council in December 2014, the EFSI was established in 2015 by the European Commission in cooperation with the EIB in order to bolster the economy through the mobilisation of private financing for strategic investments. The EFSI is one of the three pillars of the Juncker Plan, the other two being the European Investment Advisory Hub and the European Investment Project Portal. Initially, the EFSI comprised a guarantee of 16 billion euro from the EU budget plus 5 billion euro from the EIB's own capital, with the aim of triggering investment to the sum of 315 billion euro. The EFSI has been integrated into the EIB Group, and projects supported by the EFSI are subject to normal EIB project cycles and governance. It has been extended in July 2018, and the so-called EFSI 2.0 contains an extra 10 billion euro of guarantees and pledges to reach a new target of 500 billion in investment by the end of 2020. In March 2019, a preliminary agreement was reached as to its successor, InvestEU, which is based on a guarantee of 38 billion euro from the EU budget and aims to mobilise around 650 billion euro of investment in the period 2021–2027 in order to keep the EU social, green and competitive.

<sup>14</sup> They represent some 17% of the EIB's 2016 total lending volume and some 3% of the bank's total outstanding loans.

<sup>15</sup> A preliminary agreement was reached between the European Council, the European Parliament and the European Commission on March 21, 2019.

<sup>16</sup> Statutory reserves increased from 16.4 million in 2006 to 24.3 million in 2016; provisions for risks from loans / guarantees increased from 2.5 million in 2006 to 7.2 million in 2016. In 2016, an additional general loan reserve was created with 3.3 million euro. General reserves have more than doubled in size since 2008, and they reached 47.3 billion euro in June 2018.

<sup>17</sup> Structured finance loans are considered assets that are 100% risk-weighted, so their balance sheet should keep a Cooke ratio of at least 8%.

banking for advisory services. In the turbulent economic environment characterised by various challenges, such as the globalisation of supply and demand, climate change and the current economic crisis, the EIB's current BM has proven to be robust, well made, pertinent and sufficient, allowing the bank to survive and thrive, as shown by its increased lending. In this way, the EIB could support all relevant EU policies. It has continued its activity in relation to regional development as well as economic and social cohesion in the EU.<sup>18</sup> The EIB has also addressed new needs, including human– capital development, innovation and competitiveness, SMEs and climate-change mitigation.<sup>19,20</sup> The departure of Great Britain from the EU could jeopardise the operations of the EIB by weakening its funds to the point of a reduced credit rating, as Great Britain is one of the four largest EIB shareholders. The remaining twenty-seven shareholders, however, have already declared themselves ready to replenish the EIB's subscribed capital on a pro-rata basis to compensate for the loss of Great Britain's share of 39.2 billion euro. The 3.5 billion euro paid-in portion of capital will be funded from the EIB's reserves. Moreover, as foreseen in Article 150 of the draft withdrawal agreement between Great Britain and the EU, published on November 25, 2018, Great Britain's paid-in capital will be repaid by the EIB over twelve years, beginning in December 2019, with annual instalments of 300 million euro. The final instalment of 196 million will be paid in 2030. Great Britain will remain liable for the EIB operations that its subscribed capital has financed prior to its exit from the EU (UK Government, 2018). According to Mertens and Thiemann (2018), some shareholders have offered to inject additional paid-in capital by increasing their respective relative shares in the bank's capital. Werner Hoyer (2019) spoke of two countries without naming them, but based on press reports, they are suspected to be Romania and Luxembourg. The change in relative shareholding and voting power will certainly trigger more general discussions, estimating that the EIB statute, which will have to be modified due to Brexit, will be an occasion for a new revision of the EIB's BM. A sneak preview has been already announced by the EIB (EIB, 2019). The upcoming revision of the EIB's BM is deemed necessary to secure its future operations. Several important parameters of its current BM are about to change, including its capital adequacy metrics: Despite the capital replenishment after Brexit, the weighted average rating of its shareholders in conjunction with EIB's high leverage implies a reduction in activity in order to maintain satisfactory capital adequacy. A further reduction in activity can be expected based on the fact that the EIB will no longer handle all of InvestEU's funds. Moreover, as announced by Werner Hoyer, the EIB stands 'ready to help bundle EU resources' and 'help establish an EU development finance architecture' (EIB, 2019, p. 16). This new development entails a spin-off of the EIB's relevant portfolios, representing, on average, 10% of its annual lending amounts and 95% of its outstanding loans at the end 2017. The identity of such an institution could either comfort or strain the EIB's capital adequacy, depending on its capital requirements and shareholding structure. In any case, such an institution implies the cooperation of the EIB, the Commission, as well as other MDBs (e.g. the European Bank for Reconstruction and Development) and bilateral development banks or commercial banks.

*Chart following on the next page*

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<sup>18</sup> For this, the EIB provided in 2018 32% of its annual lending; its exposure in countries in Southern Europe represented 39% of outstanding loans in 2016 (Spain: 18.7%; Italy: 12.7%; Portugal: 3.9%; Greece: 3.4%).

<sup>19</sup> For each of them, the EIB provided some 26% of its aggregate lending in 2018.

<sup>20</sup> This represented almost 30% of the EIB's new financings in 2018.

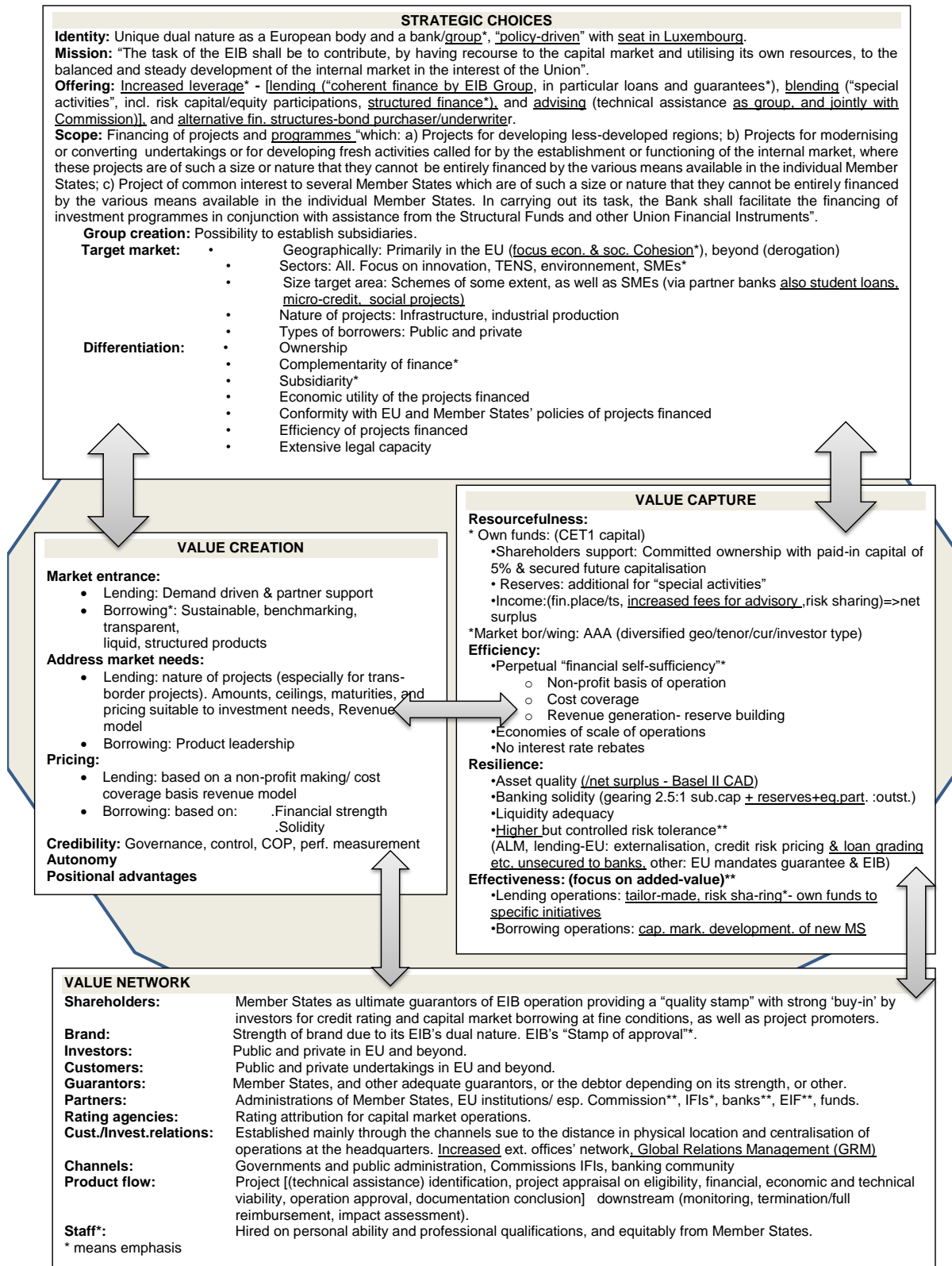


Chart 1: The EIB's 2010 business model

### 3. CONCLUSION

Lindblom's incrementalism has characterised the evolution of the EIB's BM over the past sixty years: Small incremental changes, rather than large extensive ones, have been carefully tested and introduced in a gradual process of inclusion.

The two revisions, undertaken within a short period of ten years, reflect the prevailing complexity of the economic environment before and after the introduction of the euro. The EIB's 2010 BM has increased the bank's flexibility by allowing for different banking activities, as well as advisory services, to properly begin and plan new bankable investment schemes under one roof. Since its establishment, the EIB has grown to become a prominent EU institution. This is clear from the size of its balance sheet and its role in supporting, through viable project financing, EU policies and the economies of EU member states. The importance of the EIB's policy has been reinforced by the bank's 10 billion increase in capital in 2012. Its key role and mandate for the EU has been recently evidenced in the confirmation of its continuous role in the implementation of the Juncker Plan and InvestEU. The EIB sees its role in InvestEU as a way of maintaining its relevance: 'InvestEU, from our perspective – from the perspective of investment and growth – is about transforming EFSI into a long-term, robust and financially sustainable tool to support EU policy delivery, notably in those key areas of innovation, climate and cohesion ...' (EIB, 2019, p. 11). Dethroning the EIB from its long-held prominent position as the sole counterparty of EU's major financing initiatives and placing it on the same level as other major financing organisations will allow the EIB to continue supporting projects in economic sectors of prime importance, such as innovation and climate-change mitigation. Furthermore, InvestEU appears as a way for the EIB to create closer ties with its sister institution, the European Commission, through 'integrated partnership' (EIB, 2019, p. 12). As shown in the analysis of the EIB's current BM, the bank's affinity with the Commission and the ECB, as well as the extensive shareholder support it receives, are some of the crucial factors that influence the EIB's prime position among its peer MDBs. The departure of Great Britain from the EU will be certainly be the next turning point in EIB's history, where a major change in its current BM can be expected, in order to assure the bank's successful future operations.

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# INVESTIGATING THE IMPACT GROWTH HAS ON CUSTOMER SATISFACTION AND BRAND LOYALTY: THE CASE OF THE LITTLE BRITAIN PUB COMPANY

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## ABSTRACT

*Mabkhot (2017) calls for more research to be conducted across different countries and sectors to further understand how loyalty effects customer satisfaction levels. Many scholars highlight the importance of brand loyalty in the service industry; customers will return if satisfied and have a belief that no other brand could satisfy their needs in the same way (Baser, et al., 2015). This study investigated the potential effects organisational growth has on the levels of customer satisfaction and, in turn brand loyalty within the public house sector in the UK. The research is distinctive as it focuses on a growing organisation, known as the Little Britain Pub Company, in a period of market decline. According to the BBC (2018) and The Real Ale Campaign (<http://www.camra.org.uk/>), the pub closure rate reached 18 per week in 2018 in the UK. This study focused directly on customers' perceptions over time, as the Little Britain Pub Company grew from a small, independent pub into a chain. The methods used in this research explored how the owner, employees and customers viewed and experienced the Little Britain Pub Company's growth. Here a mix of questionnaires and in-depth unstructured and semi structured interviews were utilised. The findings indicated that each time a new site was opened, customer satisfaction levels decreased in the established sites but then experienced a period of recovery as a new site became established. The study also understood that customer loyalty to the Little Britain Pub Company brand induced positive word-of-mouth, with satisfied customers willing to repeatedly return. The questionnaire targeted the Little Britain Pub Company's customer base. The results here indicated a positive feeling towards the growth of the brand as well as an increased level of loyalty. This research contributes to the hospitality sector as it demonstrates that organisational growth can have a negative impact upon customer satisfaction, and that growth can positively effect customer satisfaction and brand loyalty in the long term. Demonstrating a case of 'short term pain for long term gain'.*

**Keywords:** *Customer satisfaction, brand loyalty, growth*

## 1. INTRODUCTION

The United Kingdom (UK) pub industry has experienced a turmoil of changes over recent years with the indoor smoking ban, however, despite having lost a decade of successful sales (Robinson & Blitz, 2013) the British pub is on the rise again. The pub underwent a recent transition and the trend of closures has been bucked by many thriving pubs that are innovating to stay ahead of the market (Greenking, 2017).

As the British pub is often run by small to medium enterprises (SME), these particular businesses making up over 99% of UK businesses and the service industry accounting for 79% of UK employment pubs represent a vital role in understanding and maintaining the modern economy (Rhodes, 2017). This research will be focused on the Little Britain Pub Company (LBPC) who took sales of £509,880 in the first year and £3,454,643 in the seventh year, making it a 577% increase in sales. They are also a good example as they have reinvested their money into new sites (now owning five pubs) and have never experienced an annual fall in sales. Contradicting McClean, 2016 statement that owning and running a pub has become risky due to weakening sales and rising capital expenditure; pubs under a £25million turnover are experiencing stagnated rates. The research looks directly at the relationship of customer satisfaction and brand loyalty within the service industry, specifically the pub and restaurant sector, with an aim of understanding the relationship between the two and whether sustaining growth through increasing customer satisfaction and loyalty as a strategy to reduce risk (Russell-Bennett, et al., 2007). Understanding why some firms grow and others do not can help to predict the outcome of a start-up business and increase the support (Uddenberg, 2015). The aim of the study is to understand how closely the LBPC's business model displays factors of current research such as having growth as an end goal is counterproductive but that maintaining positive attitude is the greatest driver of growth (Wicklund, 1998). This research is important to undertake as there is very little exploring the relationship between a successful SME and the levels of CS and BL a customer receives. There is also no definite theory about SME growth and models range from three to ten stages (Lipi, 2013). The idea of this research is to provide a framework other SME can follow which will increase their chances of becoming successful. From the information understood about customers this will help to understand the factors which affect and drive SMEs.

## **2. OBJECTIVES**

1. To critically review literature concerning customer satisfaction and brand loyalty in relation to SME growth theories
2. Identify how growth affects a brand and the difficulties with maintaining growth, with focus on creating a framework relevant to LBPC by understanding themes of success.
3. To understand how current and future customers feel about SME growth in the pub trade and whether growth would change how they inherently view the company with focus on the point customers would no longer be satisfied with the company.
4. To discuss the implications of customer satisfaction and brand loyalty making recommendations on how to utilise these behaviours to ensure maintained growth.

## **3. LITERATURE REVIEW**

There has been a large amount of research surrounding the effects of brand loyalty and customer satisfaction on a business, and how to utilise these factors to make a company more successful. However, there has been very little research on how brand loyalty and customer satisfaction can affect SME growth. This research will allow companies like LBPC to understand what they must prioritise to maintain a high level of customers as they grow their business.

H = Hypothesis

### **3.1. Brand loyalty**

Jacoby and Olson define brand loyalty as "the non-random and long existing behavioural response from customers and the mental process of a purchasing decisions when other brands are considered" (Rizwan, et al., 2013, p. 84). Roustasekehravani, 2015 focused on the importance of brand personality to brand loyalty, customer satisfaction and the relationship



between customers and brands, stating the importance of future researchers to understand the complex factors affecting the relationship between brand and customer (Roustasekehravani, et al., 2015). However, loyal customers are important to businesses within the service industry as they will continue to return if satisfied, with the belief that no other brand will be able to satisfy their needs in the same way (Başer, et al., 2015).

H1: Brand Loyal customers increase profits.

Brand loyalty is often explored in relation to marketing as increased frequency of customers will increase market share and reduce operational costs (Vazifehdust, et al., 2018). This is supported by Abubakar, 2014 who hypothesises that it costs six times more acquire new customers than to retain existing customers (Abubakar, 2014). Loyal customers market by spreading positive word-of-mouth diminishing the need for expensive marketing (Teimouri, et al., 2016). Successfully persuaded brand loyal customers offer several benefits to organisations as companies can achieve a sustainable competitive advantage by maintaining existing customers which can produce higher profit margins and brand loyal customers are often less sensitive to price increases (Mostert, 2016). Mabkhot, 2017 study calls for more research to be conducted across different countries and sectors to further discover how loyalty affects satisfaction (Mabkhot, et al., 2017).

H2: Brand loyal customers spread positive word-of-mouth.

H3: Brand loyal customers are less sensitive to price increases.

### **3.2. Customer satisfaction**

Satisfaction is an overall evaluation on experiences with the business, from performance of the service during and after purchase, this ranges from satisfaction to dissatisfaction (Yang, et al., 2017). Other researchers define customer satisfaction as an emotional difference between what they anticipate they will receive, and what they receive (Yang, et al., 2017). Customer satisfaction has a culminating impact upon the future behaviour of customers, the likelihood of a repeat purchase and the possibility that they recommend the service to others (Roustasekehravani, et al., 2015).

H4: Satisfied customers will repeatedly return.

Customer satisfaction is based on what a customer believes they know about a business and the businesses ability to achieve that expectation. This is often a key element of how businesses bounce back from any backlash. When the expected level of service is higher than the service that is received, this is when the customer is likely to feel dissatisfied (Ly & Loc, 2017). The consequences of customer satisfaction, explored by Szymanski and Henard (2001) is "complaining behaviour, negative word-of-mouth and repurchase intentions" (Ly & Loc, 2017, p. 113). This is important to Rajić's study which concluded that customer satisfaction is the most significant factor for loyalty (Rajić, et al., 2016). A satisfied customer will have high intentions to become and stay brand loyal, creating benefits for the company. Service providers will place a higher priority on customer satisfaction as it is the key to customer retention (Kumaradeepan & Pathmini, 2017).

H5: Satisfied customers will become brand loyal.

Although customer satisfaction can often lead to brand loyalty, customer satisfaction also directly affects brand loyalty, if negative, this will directly affect a business and their pricing

strategy (Ali & Muqadas, 2015). To benefit from true customer satisfaction companies must understand customer needs, provide a good service, and be able to satisfy complaints. For this to be beneficial companies should concentrate on customer satisfaction and brand performance (Awan & Rehman, 2014).

H6: Negative experiences affect satisfaction but not loyalty.

H7: Increasing satisfaction will positively affect a company's performance and growth.

### **3.3. SME growth theories**

Existing SME models lack theoretical consistency and offer few explanations of how medium-sized SME's shift to their next stage (Li & Tan, 2004). If a company experiences growth at the beginning, it's chance of survival is doubled (Pizzacalla, 2012). Growth and survival are both determined by different purposes within the business, some businesses may merely seek to survive whilst others seek to grow which causes qualitative differences between the strategic approach a firm may take (Fadahunsi, 2012). Cooney, 2012 demonstrates several desired factors for a business from the entrepreneur, firm and strategy that affects the success of a business. Motivation is important for growth, some businesses do not look to grow, only to survive, although this is not a determining factor of successful SME growth, it significantly influences strategic choices (Indarti & Langenberg, 2004). Ownership and management experience may make managers more cautious especially if they have experienced failure, but this also implies they have already learnt from mistakes (Jennings, 1998). Generally middle-aged business individuals who have more than one owner of a company are better at maintaining and growing a business as they possess the best mix of "experience, credibility, energy and resources" (Fadahunsi, 2012, p. 109).

H8: The more desirable factors a company possess, the more successful the growth.

In a review of literature surrounding the growth of SME's it is condensed into five main stages of growth; however, the literature assumes that a company passes through all stages to achieve growth, without it they will fail in the attempt (Churchill & Lewis, 1983). The stage models that have been created to help explain SME growth often fail to capture the early important stages of growth an enterprise experiences prior to the start-up (Li & Tan, 2004). Exclusively looking at the S-shaped SME growth theory: The first phase is business set-up with relatively low growth rates. This develops into the expansion and early growth stage that is characterised by the rapid expansion or turnover and employment. Growth rates then decline as the company enters the maturity stage. Here, a trade-off between maintaining an attractive income and a better quality of life or expanding the business, taking more risks with increased stress and reduced income (Schmitt-Degenhardt, et al., 2002). Consciously not investing money back into the business causes growth to slow, and the business to eventually die (Gregoriou, 2013). However, the S-shaped growth model does not explain why business growth slows at certain stages. There is a need for two models: one that applies to businesses that have the intention of growing and another for businesses who simply want to maintain a reasonable income (Schmitt-Degenhardt, et al., 2002).

H9: Taking risks and reinvesting money positively affects growth.

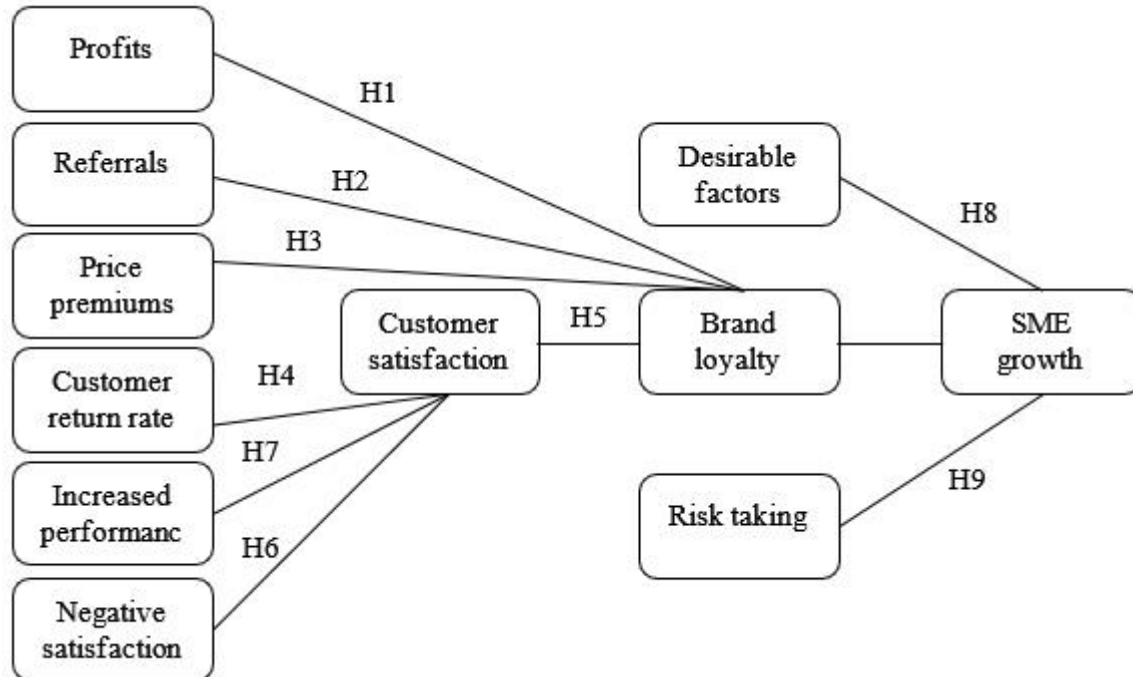
The current success of SME growth models is low as SME development is constant to a variety of forces in the marketplace. Most frameworks categorise companies by their annual sales and ignore important factors such as number of locations and rate of change, some companies will

work hard just to pass through survival stages, and the creation of the company whereas others will find that they experience majority of growth in the beginning (Churchill & Lewis, 1983).

### 3.4. Conceptual framework

As seen in this framework there are few links in literature between how customer satisfaction and brand loyalty might directly affect the growth on an SME. See hypothesis throughout.

Figure 1: Conceptual framework



## 4. METHODOLOGY

The research will be inductive as it is closing current gaps in the research and literature.

### 4.1. Objective two: Unstructured interview

A qualitative interview approach was used to gain in-depth and detailed perspectives from the owner to gain a deeper understanding of growth. The interviewer had a check-list of issues, pertinent questions and themes for the researcher to analyse their response. The aim of this data collection was to understand the experience of a growing SME from an owner's perspective. The interview was conducted by telephone. The range of topics to be discussed was explained to the interviewee prior to the call but a list of questions was not given so spontaneity was not lost, and answers were honest (Kvale & Brinkmann, 2009). The interview lasted thirty minutes.

### 4.2. Objective three: Questionnaire

The questionnaire was structured to understand the level of loyalty to a pub when there was considerable alternative available (Başer, et al., 2015). The questionnaire was formed of qualitative, standardised open and closed questions, including rating questions. SurveyMonkey was used as this platform provided an easy to use interface with the ability to analyse analytics. The questionnaire featured a descriptive covering note describing the reason for the research. 62 respondents completed 100% of the questionnaire. When conducting data analysis of the questionnaire the Likert Scale was used for the final question. The data from the rest of the questionnaire is exploratory data and was transferred into graphs and bar charts to clearly express the results (Mao, 2015).

#### 4.3. Objective four: Secondary data collection

This objective was completed by using secondary data, performing a documentary text data collection from web comments (Saunders, et al., 2012). The first part of the data collection involved taking the reviews from each pub since opening from TripAdvisor and Facebook inputting every review into the table for each quarter below; 1 = Terrible, 2 = Poor, 3 = Average, 4 = Very Good, 5 = Excellent.

### 5. KEY FINDINGS

#### 5.1. Objective two: Unstructured interview

Growth: The participant mentioned how they put little pressure on growth and understands that “if we were to open another pub in a completely different region... (we’d see) a slower growth curve again”. Loyalty: The participant spoke positively about customers loyalty to the company “there’s a level of trust in the LBPC... we’ve got the familiarity factor... people welcome the idea of us coming into the village”.

#### 5.2. Objective four: Questionnaire

The aim of this question was to understand how a customer would feel is the pub group did grow, as a customer how would they feel towards the change in size or price? How would this impact how customers viewed the brand?

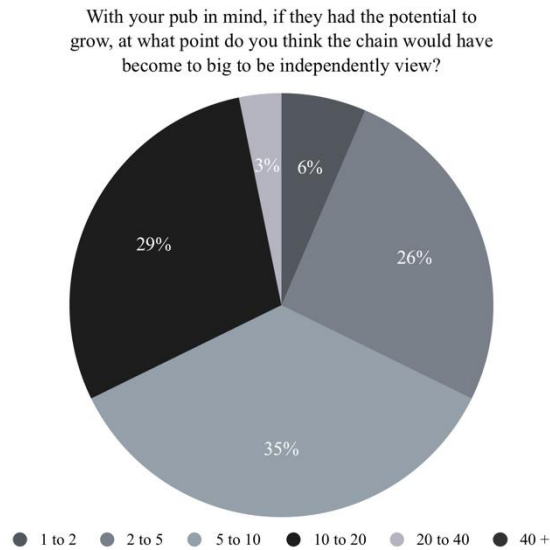
*Figure 2: Questionnaire results*

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I will always be loyal to LBPC regardless of the size	3	20	20	14	3
I am excited for LBPC to expand and grow and to be able to visit future and current pubs	5	21	22	12	1
I trust them to keep up the standards of current pubs	7	39	11	3	0
If the pubs were to raise their prices slightly I would still go	2	35	10	13	1

The pie chart demonstrates how many pubs a brand who have to own before it become too large to still be independently viewed.

*Figure following on the next page*

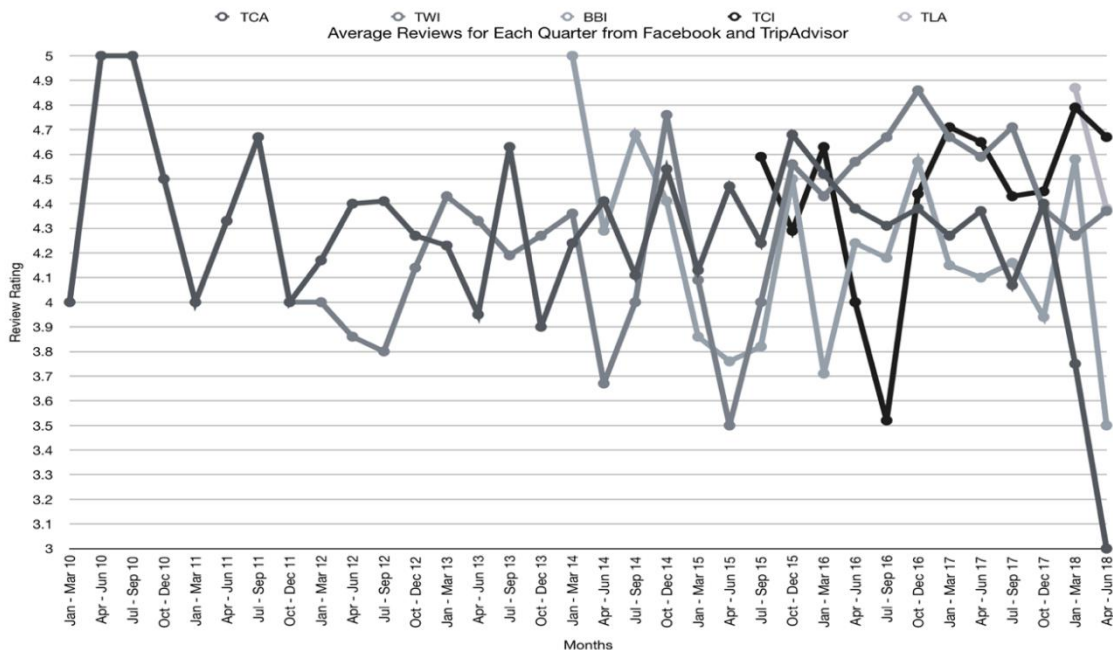
*Figure 3: How many pubs a brand who have to own before it become too large to still be independently viewed*



### 5.3. Objective five: Secondary data collection

Figure 4 shows the average review across Facebook and TripAdvisor for each quarter from the opening of the first pub until present. As you can see from the results reviews seem to drop around the time the company opens a new site.

*Figure 4: Average reviews across Facebook and TripAdvisor for each quarter*

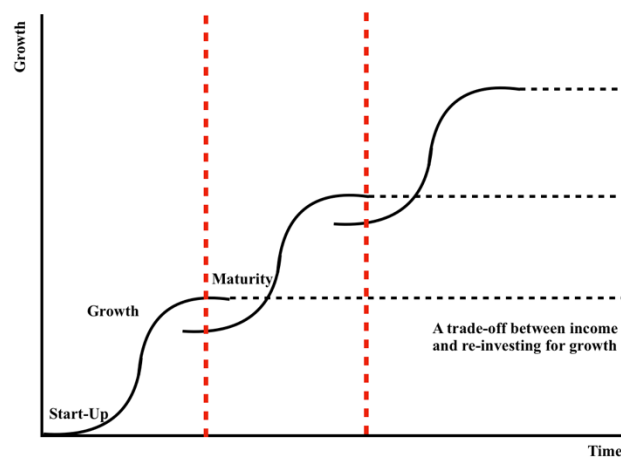


## 6. DISCUSSION

The success of the pubs is a mix of five characteristics: location, facilities, image, the service it provides and the price (Bhargav, 2017). The current S-shaped growth theory curve does not explain why business growth slows at certain stages, prompting a need for two models; one for companies that want to grow and one for companies that are interested in income only (Schmitt-Degenhardt, et al., 2002).

Themes that arose from the interview with the owner of the LBPC were that he puts little pressure on growth, which could be a defining factor of success. Despite last year's growth being 0.3% (2016-2017) which has been the lowest since founding the company. This was due to it being the first year since opening the company that they hadn't opened a new pub or invested into one of their other pubs and focus was pulled away to the upcoming opening of a new pub. From information gathered throughout the research, this graph was generated. The SME model demonstrates the trade-off between re-investing profits into the company or maintaining the company as it matures and receives little growth. The model suggests that if you do not re-invest money e.g. increasing head office management or buying/updated pubs for the company that you will be unable to move to the next stage, but that as you grow into the next stage you will begin slightly worse off in the maturity stage; the project will start up, issues will arise, these issues will be addressed and will begin to grow. The growth will eventually plateau out, prompting a need to again decide whether to re-invest money or maintaining personal income.

*Figure 5: The SME model*



This objective two confirmed H2 that loyal customers create a positive effect through word-of-mouth as proven by members of the local community backing the purchase of the most recent pub. Objective two also answers H8 that the more desirable factors a company possess (Cooney 2012), the more successful the growth will be. This has been demonstrated in the literature explored and the information gathered from the interview with the owner. This paper demonstrates that there is little current research exploring how customer react to a growing chain. The questionnaires aim was to understand at what point customers would be dissatisfied with growth. Objective three was very specific to the LBPC but gave a good understanding to what extent customers are loyal to the LBPC brand. A defining question in the questionnaire explored how respondents' feelings would be towards growth of their pub/restaurant into a chain, most responded: "this is great, I love to see them being successful". This has added to current research and literature as it demonstrates that customers feelings towards growth are positive, proving that satisfaction will lead to brand loyalty. This partially confirmed H9: Taking risks and reinvesting money positively affects growth as LBPC have taken a risk to grow the company and it has been met with increased revenue growth and returning customers. 39/62 of respondents agreed that they trust the brand to keep up the standards if they grow. This is due to high levels of satisfaction which has led to brand loyalty. The aim of the secondary data analysis collection was to understand if there was a pattern between new pubs being opened and satisfaction decreasing. From collecting the results there is a pattern of decreased customer satisfaction when a new site is opened, this is important to note as loyal customers are less

costly to a business. Companies should be ensuring that the group of people who will market through word-of-mouth increasing revenues and profits (Hwang, et al., 2005) maintain a positive view of the company around the times a new site is opened so they can become an advocate for it. The reason for decline in reviews was speculated to be because attention from key influencers was directed to the newest pub causing standards to slip in the company elsewhere. Key staff often move to facilitate pub openings which would also explain the slip in standards. The newest pubs are promoted to customers within the other pubs, causing a loss of business for a while at the older sites. There is also a group of people who will visit the new pub without having previously experienced others in the chain. They enjoy their experience so decide to try one of the sister pubs, where they compare their experience of reality and expectation (Ly & Loc, 2017). This can be met with disappointment as the sites are older and food is not the same, causing bad reviews. In this case, what customers anticipate they will receive and what they do receive is very different (Yang, et al., 2017). Quick secondary research could be done to see if this is a recurring trend in similar companies. Researchers in the past have proved that a loyal customer of a company's brand is satisfied with that specific brand and will seek to repurchase it in the future (Abdul, et al., 2016), although this seems to be the case and was proven in the questionnaire there is little research on maintaining growth.

## 7. CONCLUSION

To conclude, growth does have an impact upon customer satisfaction and brand loyalty, however, in the light of this study growth has positively affected customer satisfaction and brand loyalty in the case of the LBPC. Although they have been successful with their rapid growth rate, there is a correlation between opening a new pub and the others deteriorating for that opening quarter. Brand loyalty and customer satisfaction are important factors of a growing SME as loyal customers support the growth of the pubs and bring in revenue. The owner appeared to put little pressure on the company to grow which has allowed LBPC to grow at their own speed successfully. The most successful research to come out of the report was the proposed development of the S-shaped SME growth framework, developed to show LBPC's growth, and could be applied to similar companies explaining reasons for growth. The research discovered that brand loyalty and customer satisfaction does impact upon growth, as without reduced costs from loyal customers spreading word-of-mouth the pubs would not be as successful and marketing may not reach the right people. The questionnaire discovered that brand loyalty and customer satisfaction has been achieved as people are generally welcoming of growth. The most significant finding was the growth rates of the company provided by the owner and the correlation between a pub being opened and a significant fall in average reviews across the company's other sites. It is proven that in a smaller business something as large as opening a new pub will lead to a drain on day to day resources across the board causing standards to slip and satisfaction to decrease. This research provides information that could reduce the fail rate and be applied to similar companies with the intention to grow. This research also provides considerations on company growth size customers feel is appropriate before being viewed as a chain, the recommended number of sites by customers was five to ten.

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## THE EFFECT OF INDIVIDUAL ECONOMIC INDICATORS ON SOCIAL DEVELOPMENT, NATIONAL SECURITY AND DEMOCRACY: A NEW PERSPECTIVE

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### ABSTRACT

*Economic aspects play an important role in social development, national security and world's democracies in nowadays society. Economic welfare, social development, homeland security and democracy are in mutual relationships. Social development is a necessary instrument of state governments to enable proper supplies of goods and services to their citizens. Also democracy has irreplaceable influence on national economy – various positive or negative effects. Democracy provides mechanisms and institutions that will enable real and social development, and the development progress will create objective conditions and a global conducive to the consolidation of democratic practices in society. Undoubtedly, national security has played a major role in the process of economic development for many years. This paper deals with the economic impact on social development, homeland security and global democracy. In our research social development is expressed by the Social Progress Index, national security by the Global Peace Index and democracy by the Democracy Index. The main target is to find out correlation between the Social Progress Index/Global Peace Index/Democracy index and individual economic indicators (gross domestic product, gross national income per capita, inflation and unemployment). In order to calculate results, we gathered data of the specific indexes and indicators in 162 countries from the years 2014-2017. Using statistical methods, we confirmed the fact of the increasing/decreasing Social Progress Index, Global Peace Index and Democracy Index in relation to the selected increasing/decreasing economic indicators. Based on these correlations we made comprehensive statements about links between the individual economic indicators and social development/national security/democracy. There is not an automatic link between the economic indicators and factors of social development, effective democracy and powerful national security. Countries of/with similar economic aspects may have vastly different social, security and democracy conditions. This analysis can be used as a detailed informative overview about economic aspects in social, security and democracy development.*

**Keywords:** *correlations, democracy, economic indicators, security, social development*

### 1. INTRODUCTION

Economic factor is significant for many areas of human development and it is impossible to separate economic progress from social, security and democracy areas. Economic growth directly affects the ability of government to improve social development of their citizens. There is a strong correlation because each country needs financial capital to enhance living conditions of people.

Economic growth and social development require a balance of economic growth with a moral social responsibility. Social development should become an important objective. This development includes many indicators, such as infrastructure, medicine, housing education, food quality, etc. Economic growth and social development are dependent on each other because a country cannot afford social progress without financial investments. (Holmes, 2019) These statements are supported by research which analyses the economic factors related to social development: The links between economic growth and social progress (Esposito, M., Altukhov, A. and Shulguin A.P., 2017), The Relationship between Economic Development and Social Welfare: A New Adjusted GDP Measure of Welfare (Sardar I., Clarke M., 2002, p. 201-228), Economic Growth and Social Development: A Statistical Investigation (King M., 1974, p. 251-272) and Social development is economic development (Birdsall, N., 1993). Homeland security is a broad concept related to the issues encountered by nations faced with threats to the security of their citizens. Governments usually accord high priority to national security and in terms of potential threats, they are willing to dedicate large human and material resources. Allocating resources for security and defence has economic implications and homeland security thereby becomes an economic issue. (Lifshitz, Y., 2003, p. 1-18) Economic power of a nation guarantees national security. Apart from military means, homeland security is also achieved by successful economic performance. A booming economy serves as an enabler of national security while an economy in tailspin serves as a constraint to national security. (Ziauddin, M., 2016) Economic performance can determine military power and national security. It seems at first glance that the stronger the economy, the greater the military power; and the weaker the economy, the weaker the military power. (Ferguson, A., 2003, p. 76) In addition to that, economic factors have certain influence on terrorism which is one of the most important issues of national security (Bren, J., Zeman, T. and Urban, R., 2018, p. 978-986). Democracy is likely to have a positive direct effect on economic growth and vice versa. In addition to that, there might be other significant influences coming indirectly through various channels. The channels are human capital formation in terms of investments, political stability and income inequality, which have a strong impact on the relationship between democracy and economic development. The relationship between democracy and economic factors may differ across countries and regions. (Arif, B.W., Kayani, F.N. and Kayani, U.N., 2012, p. 199-208) The links between economic performance, quality of democracy and satisfaction with democracy are at multiple levels. The improvement of economic conditions is shown to be related to the increasing levels of national satisfaction with democracy (Christmann, P., 2018, p. 79-89).

## 2. METHODS

In the first stage, we established indexes for social development, national security and democracy. For social development the Social Progress Index (Social Progress Index, 2018) was selected. It includes these areas: basic human needs, foundations of wellbeing and opportunity. All these areas include more than 50 factors. For national security the Global Peace Index (Global Peace Index, 2018) was selected. It gauges global peace using three broad themes: the level of societal safety and security, the extent of an ongoing domestic and international conflict and the degree of militarization. For the factor of democracy the Democracy Index (Democracy Index, 2018) was selected. This index is based on 60 factors grouped in five different categories measuring pluralism, civil liberties and political culture. All these 3 indexes were considered in 162 countries from the years 2014-2017 – the creation of index number average of all years in every country. Secondly, we selected the unemployment in percentage, economic performance of the country expressed by gross domestic product (GDP) in US dollars, income of citizens expressed by gross national income per capita, purchasing power parity (GNI per capita, PPP) in US dollars and inflation in percentage as economic indicators. The dataset of these indicators comes from the World Bank Open Data.

(World Bank Open Data, 2019) All these 4 indicators were considered in 162 countries from the year 2014 to 2017 – the creation of the indicator number average of all years in every country. Based on these indexes and indicators we tested normality of the whole dataset for further statistical correlations. The normality of the dataset was not proved, so for the expression of correlations between related indexes and economic indicators the Spearman's correlation coefficient was selected. For the calculation of correlations and testing normality the IBM SPSS Statistics 25 software was used. (IBM SPSS Statistics for Windows, 2017) All correlations were determined using the 0,01 level of reliability ( $p\text{-value} \leq 0,01$ ) which means that the results were calculated with 99% probability of reliability.

### 3. RESULTS AND DISCUSSION

Social development expressed by the Social Progress Index is correlated with economic indicators (gross domestic product, gross national income per capita, inflation and unemployment). The results of correlations are described and explained in the following text, figure and graphs:

		SOCIAL PROGRESS INDEX	GDP	GNI per capita, PPP	inflation	unemployme nt
SOCIAL PROGRESS INDEX	Correlation Coefficient	1,000	,895	,887	-,469	,187
	Sig. (2-tailed)	.	,000	,000	,000	,026
	N	141	140	138	135	141

Figure 1: Correlations of the Social Progress Index with economic indicators (own construction)

Null hypothesis ( $H_0$ ): there is no correlation link between the Social Progress Index and GDP  
 Alternative hypothesis ( $H_1$ ): there is a correlation link between the Social Progress Index and GDP. According to the calculated correlation ( $H_0$  is rejected,  $H_1$  is accepted,  $p\text{-value } 0,00 \leq 0,01$ ), there is a correlation link between the Social Progress Index and GDP (Figure 1) – the higher economic performance of a state, the higher social development is (Chart 1).

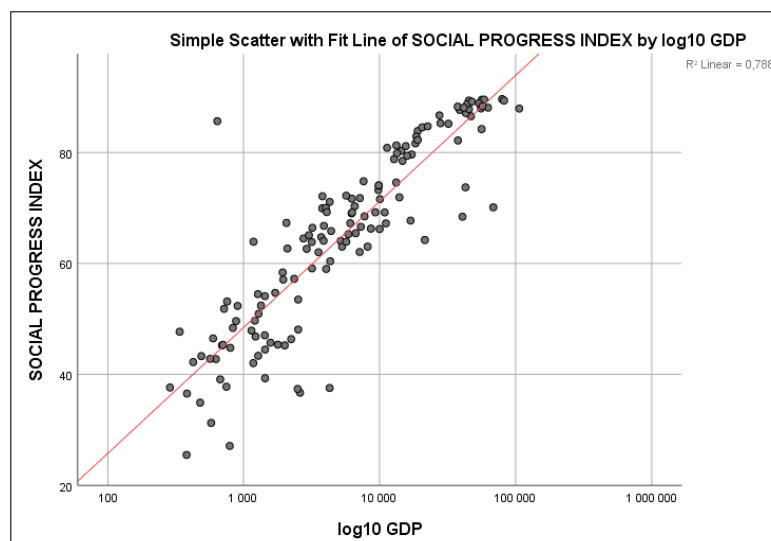


Chart 1: Link between the Social Progress Index and GDP (own construction)

$H_0$ : there is no correlation link between the Social Progress Index and GNI per capita, PPP  
 $H_1$ : there is a correlation link between Social Progress Index and GNI per capita, PPP

According to the calculated correlation ( $H_0$  is rejected,  $H_1$  is accepted,  $p\text{-value } 0,00 \leq 0,01$ ), there is a correlation link between the Social Progress Index and GNI per capita, PPP (Figure 1) – the higher the incomes of citizens, the higher social development is (Chart 2).

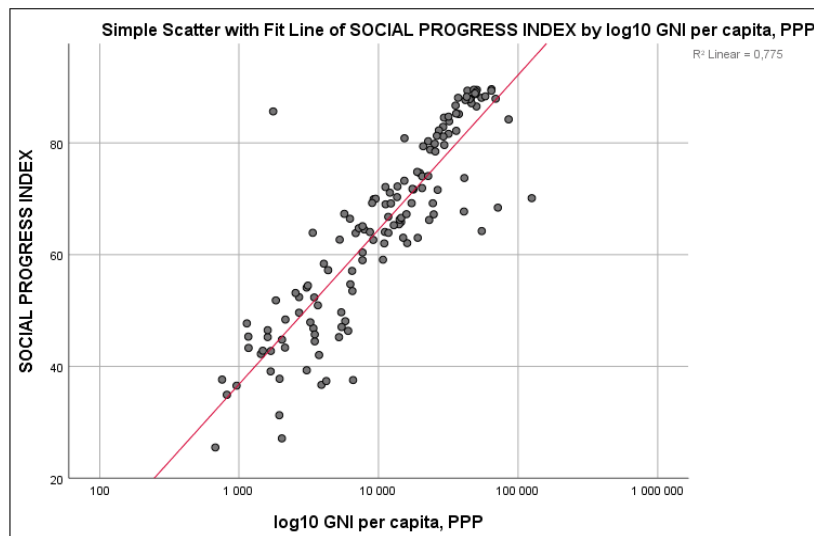


Chart 2: Link between the Social Progress Index and GNI per capita, PPP (own construction)

$H_0$ : there is no correlation link between the Social Progress Index and inflation

$H_1$ : there is a correlation link between the Social Progress Index and inflation

According to the calculated correlation ( $H_0$  is rejected,  $H_1$  is accepted,  $p\text{-value } 0,00 \leq 0,01$ ), there is a correlation link between the Social Progress Index and inflation (Figure 1) – the lower the level of inflation in a state, the higher social development is (Chart 3).

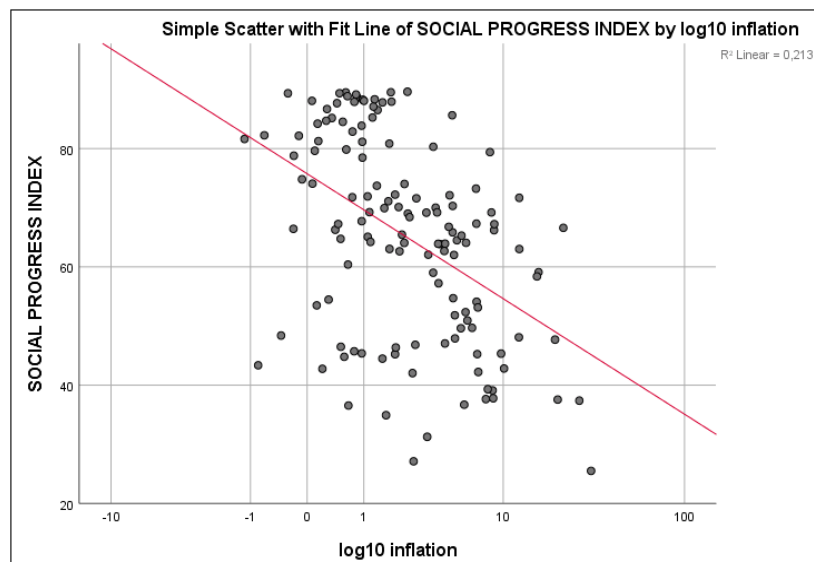


Chart 3: Link between the Social Progress Index and inflation (own construction)

$H_0$ : there is no correlation link between the Social Progress Index and unemployment

$H_1$ : there is a correlation link between the Social Progress Index and unemployment

According to the calculated correlation ( $H_0$  is accepted,  $H_1$  is rejected,  $p\text{-value } 0,026 > 0,01$ ), there is no correlation link between the Social Progress Index and unemployment (Figure 1).

National security expressed by the Global Peace Index is correlated with economic indicators (gross domestic product, gross national income per capita, inflation and unemployment). The results of correlations are described and explained in the following text, figure and graphs:

		GLOBAL PEACE INDEX	GDP	GNI per capita, PPP	inflation	unemploye nt
GLOBAL PEACE INDEX	Correlation Coefficient	1,000	,523	,494	-,379	,009
	Sig. (2-tailed)	.	,000	,000	,000	,912
	N	157	154	152	148	157

Figure 2: Correlations of the Global Peace index with economic indicators (own calculation)

H<sub>0</sub>: there is no correlation link between the Global Peace Index and GDP

H<sub>1</sub>: there is a correlation link between the Global Peace Index and GDP

According to the calculated correlation (H<sub>0</sub> is rejected, H<sub>1</sub> is accepted, p-value  $0,00 \leq 0,01$ ), there is a correlation link between the Global Peace Index and GDP (Figure 2) – the higher economic performance of a state, the higher national security is (Chart 4).

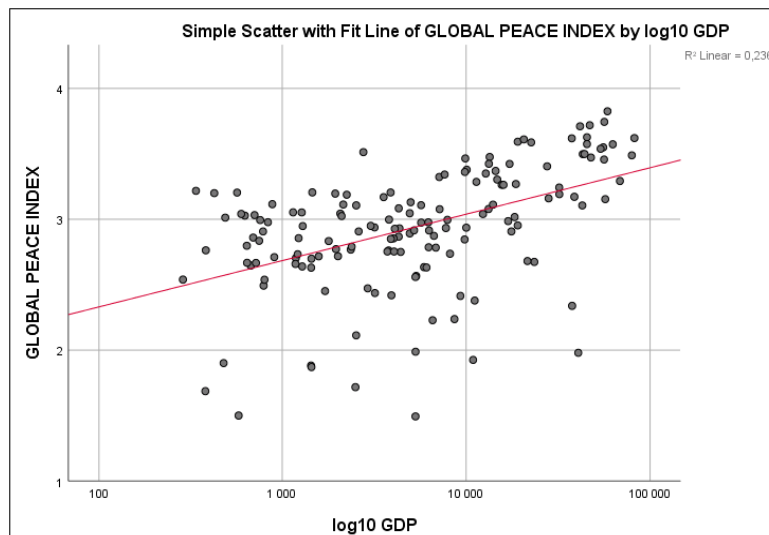


Chart 4: Link between the Global Peace Index and GDP (own construction)

H<sub>0</sub>: there is no correlation link between the Global Peace Index and GNI per capita, PPP

H<sub>1</sub>: there is a correlation link between the Global Peace Index and GNI per capita, PPP

According to the calculated correlation (H<sub>0</sub> is rejected, H<sub>1</sub> is accepted, p-value  $0,00 \leq 0,01$ ), there is a correlation link between the Global Peace Index and GNI per capita, PPP (Figure 2) – the higher the incomes of citizens, the higher national security is (Chart 5).

Chart following on the next page

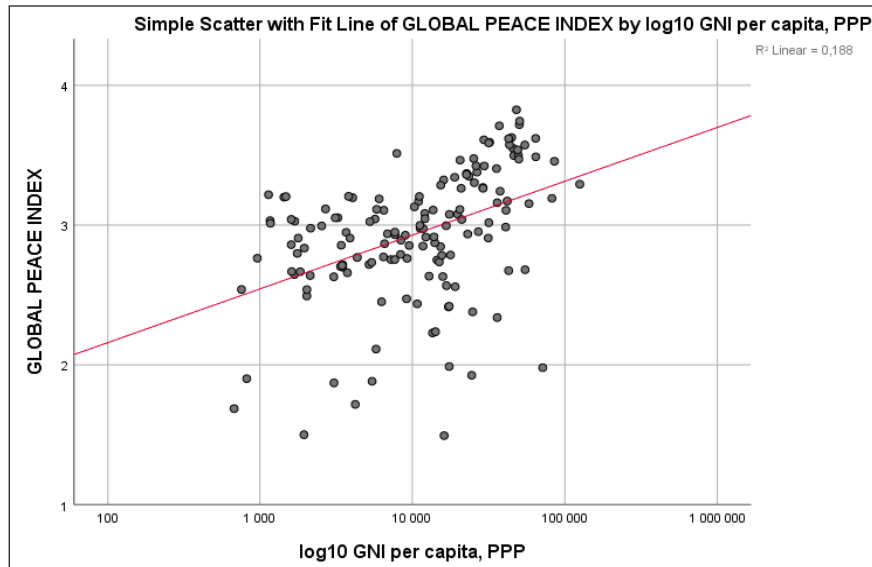


Chart 5: Link between the Global Peace Index and GNI per capita, PPP (own construction)

$H_0$ : there is no correlation link between the Global Peace Index and inflation

$H_1$ : there is a correlation link between the Global Peace Index and inflation

According to the calculated correlation ( $H_0$  is rejected,  $H_1$  is accepted, p-value  $0,00 \leq 0,01$ ), there is a correlation link between the Global Index and inflation (Figure 2) – the lower the level of inflation in a state, the higher national security is (Chart 6).

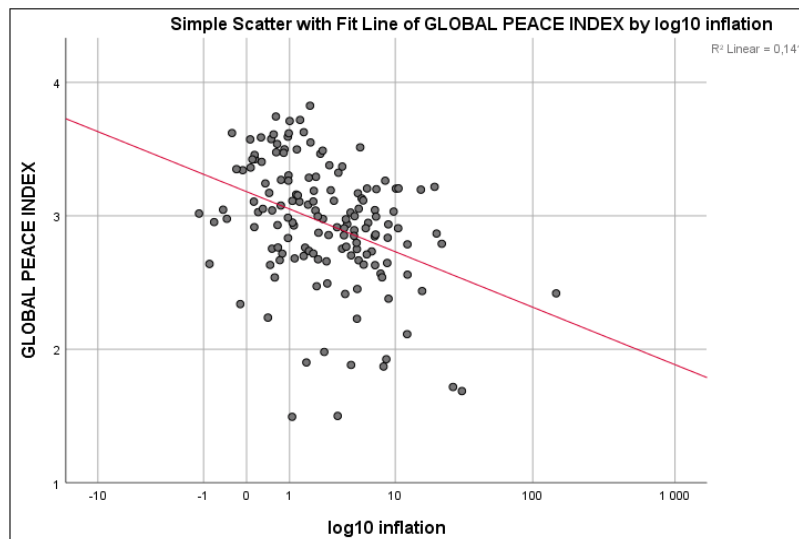


Chart 6: Link between the Global Peace Index and inflation (own construction)

$H_0$ : there is no correlation link between the Global Peace Index and unemployment

$H_1$ : there is a correlation link between the Global Peace Index and unemployment

According to the calculated correlation ( $H_0$  is accepted,  $H_1$  is rejected, p-value  $0,912 > 0,01$ ), there is no correlation link between the Global Peace Index and unemployment (Figure 2). Democracy expressed by the Democracy Index is correlated with economic indicators (gross domestic product, gross national income per capita, inflation and unemployment). The results of correlations are described and explained in the following text, figure and graphs:

		DEMOCRACY INDEX	GDP	GNI per capita, PPP	inflation	unemployment
DEMOCRACY INDEX	Correlation Coefficient	1,000	,590	,539	-,367	,124
	Sig. (2-tailed)	.	,000	,000	,000	,115
	N	164	161	159	154	164

Figure 3: Correlations of the Democracy index with economic indicators (own calculation)

H<sub>0</sub>: there is no correlation link between the Democracy Index and GDP

H<sub>1</sub>: there is a correlation link between the Democracy Index and GDP

According to the calculated correlation (H<sub>0</sub> is rejected, H<sub>1</sub> is accepted, p-value  $0,00 \leq 0,01$ ), there is a correlation link between the Democracy Index and GDP (Figure 3) – the higher economic performance of a state, the higher the level of democracy is (Chart 7).

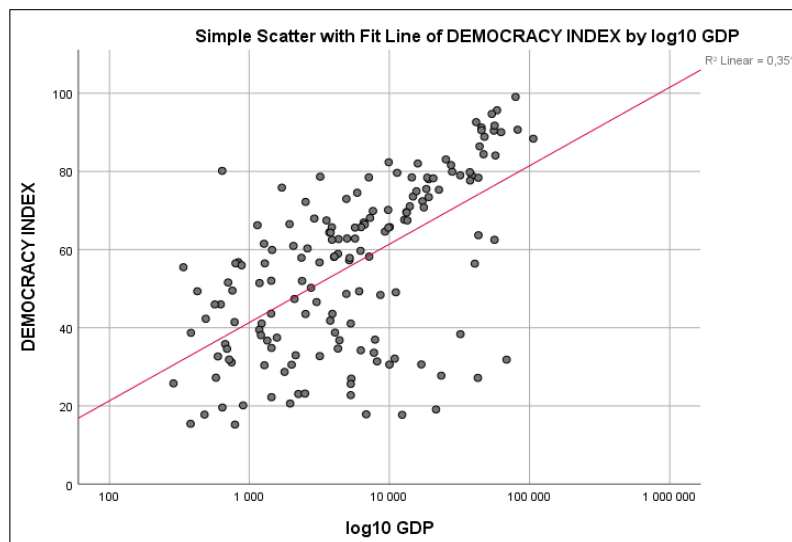


Chart 7: Link between the Global Peace Index and GDP (own construction)

H<sub>0</sub>: there is no correlation link between the Democracy Index and GNP per capita, PPP

H<sub>1</sub>: there is a correlation link between the Democracy Index and GNI per capita, PPP

According to the calculated correlation (H<sub>0</sub> is rejected, H<sub>1</sub> is accepted, p-value  $0,00 \leq 0,01$ ), there is a correlation link between the Democracy Index and GNP per capita, PPP (Figure 3) – the higher the incomes of citizens, the higher the level of democracy is (Chart 8).

Chart following on the next page



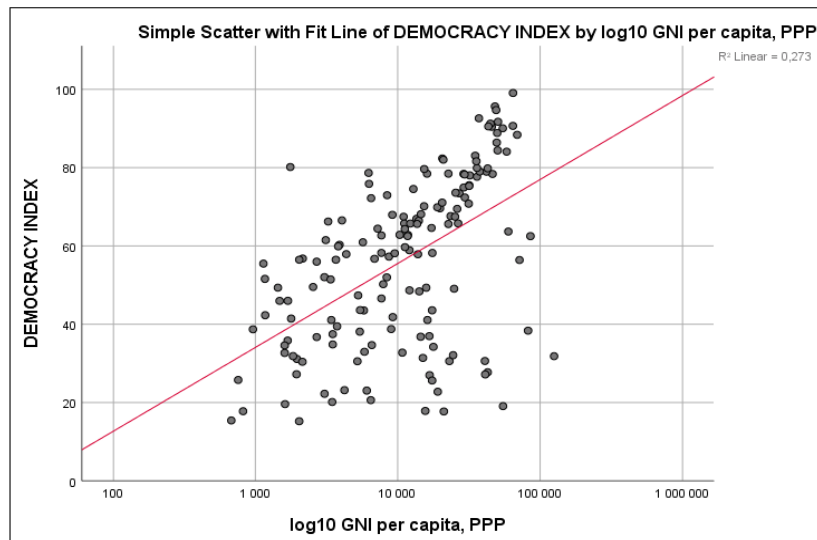


Chart 8: Link between the Democracy Index and GNI per capita, PPP (own construction)

$H_0$ : there is no correlation link between the Democracy Index and inflation

$H_1$ : there is a correlation link between the Democracy Index and inflation

According to the calculated correlation ( $H_0$  is rejected,  $H_1$  is accepted, p-value  $0,00 \leq 0,01$ ), there is a correlation link between the Democracy Index and inflation (Figure 3) – the lower the level of inflation in a state, the higher the level of democracy is (Chart 9).

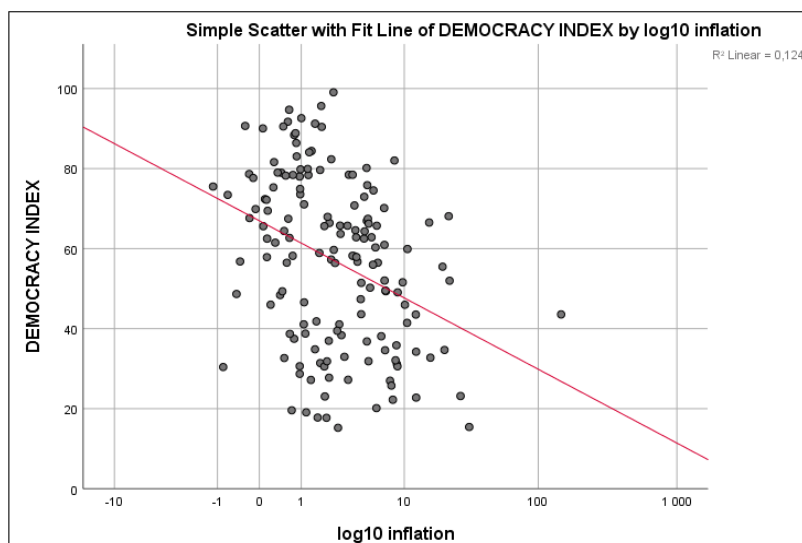


Chart 9: Link between the Democracy Index and inflation (own construction)

$H_0$ : there is no correlation link between the Democracy Index and unemployment

$H_1$ : there is a correlation link between the Democracy Index and unemployment

According to the calculated correlation ( $H_0$  is accepted,  $H_1$  is rejected, p-value  $0,115 > 0,01$ ), there is no correlation link between the Democracy Index and unemployment (Figure 3). Findings related to correlation links between the Social Progress Index/Global Peace Index/ Democracy index and selected economic factors from this chapter are summarized in the following figure (Figure 4):

	economic performance	citizens income	inflation	unemployment
social development	✓	✓	✓	
national security	✓	✓	✓	
democracy	✓	✓	✓	

Figure 4: Correlation links between economic indicators and selected indexes (own construction)

#### 4. CONSLUSION

Based on our results, there were correlation links between social development/national security/democracy and most economic indicators in 162 countries from 2014 to 2017. Economic performance, citizens' income and inflation have influenced social development, national security and democracy. Unemployment has not influenced social development, national security and democracy. The results have been confirmed with 99% probability of reliability.

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# THE IMPACT OF ENTREPRENEURIAL ACTIVITY ON POVERTY ALLEVIATION

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## ABSTRACT

*Over the last three decades, governments and international organizations such as the World Bank, the IMF, etc. have been trying to reduce poverty. Despite this, today, almost 2.5 billion people still live in poverty. Entrepreneurship is seen by many as a way to reduce poverty in all types of economies. Further, entrepreneurship facilitators can play an important role in creating a suitable environment for business activities, hence increasing entrepreneurial activities. This paper provides an insight into how entrepreneurial activity and entrepreneurship facilitators (Government, Incubators, and Financial Institutions) help in improving the business environment in all countries across the World and hence contributing to poverty alleviation. To investigate this, the Human Development Index (HDI) is used as a surrogate measure for poverty. Secondary data for Entrepreneurship (Entrepreneurial Facilitators, Entrepreneurial Activities, Governance Factors, Social Factors and Economic Factors) and Poverty (HDI) were collected for the period of 2005 to 2016. Countries analysed are grouped as high-income countries, high medium-income countries, medium-income countries and low-income countries. The study found that there is a positive and significant relationship between entrepreneurial activity and the changes in Human Development Index (HDI) across all countries studied over the 12 year period. It also found that the presence of good entrepreneurial facilitators improves the capacity of entrepreneurial activity which reduces poverty as measured by the HDI. It adds to the body of knowledge by using HDI as a new tool to analyze the impact of entrepreneurial activity in a country. Finally, its findings suggest that entrepreneurial activity may have less impact on poverty alleviation in poor countries.*

**Keywords:** *Ease of Doing Business, Entrepreneurial Activity, Poverty, Moderator Model, Panel FGLS Model*

## 1. INTRODUCTION

It has long been realized that poverty is one of the main issues that every developing country faces in its severe form, which is one of the major retarding factors in the economic growth and development of the country (Bruton, Ketchen, & Ireland, 2013). The World achieved the Millennium Development Goal of reducing poverty rate to half of the set target by 2015 (United Nations, 2015). According to the World Bank (2016, para. 2), “despite the development made in decreasing poverty, the total number of individuals living in extreme poverty globally stays high. Today, the total population living in poverty is 2.47 billion and poverty is defined as those surviving with a daily income of US\$ 2.0 or less. By estimating global growth, poverty reduction may not be fast enough to reach the World Bank’s target of ending extreme poverty

by 2030.” In reality, poverty is an issue in every country, however each may be suffering from different forms of poverty, depending on their levels of economic and social development. Thus the definitions of poverty in developed, developing and underdeveloped countries are different. Entrepreneurship is one of the oldest human activities. This activity is focused on identifying new opportunities and using those opportunities in a new business venture for monetary gain (Landstrom, 2007). Entrepreneurship is a process where an individual uses their skills to identify the opportunities and acquire and use resources and innovation to create value and fulfil the needs of those opportunities (Coulter, 2001). Each country strives hard to improve the financial well-being of its general public and explores the effectiveness of several indicators for achieving this goal (Okpara, 2011). This paper examines entrepreneurship activity and entrepreneurship facilitators (Government, Incubators, and Financial Institutions) and their role in poverty alleviation by examining high-income, high medium-income, medium-income and low-income countries as per the United Nations Development Program groupings. In order to understand the role of entrepreneurship in alleviating poverty, there is a need to review the existing evidence, theories, and barriers that impede the economies to relieve the burden of poverty. To answer these questions, secondary data for Entrepreneurship (Entrepreneurial Facilitators, Entrepreneurial Activities, Governance Factors, Social Factors and Economic Factors) and Poverty (Human Development Index (HDI) and Gross National Income (GNI)) of the period of 2005 to 2016 are used for all countries and country groupings (UNDP, 2018).

## **2. LITERATURE REVIEW**

Poverty is one of the main issues that adversely affects the lives of many individuals and the economy of every country. Almost 2.5 billion people are living below the poverty line, surviving at the income of US \$2 or less a day (Bruton et al., 2013). However, according to Lant, Klasen, Alkire, Lenhardt, and Letouzé (2013), to determine the level of poverty such low amounts are not appropriate level, arguing that the suitable level to measure poverty should be \$10 a day. Singer (2006) states, “Poverty means lack of confidence, income, lack of access to goods and services and disempowerment.” The best way to alleviate poverty and assist people is to give them an access to the basic human capital i.e. education, health, shelter. Many argue that this object can be achieved by starting new ventures and business activities through entrepreneurship (Singer, 2006). Recently, scholars have investigated possible root causes of poverty and have offered some theories to mitigate it. Scholars from other business-related disciplines such as economics, entrepreneurship, finance and management have been investigating poverty for many years and entrepreneurship scholars have recently started to pay attention to poverty and have offered different approaches and methodologies to alleviate poverty (Bruton et al., 2013). Many people are living below the poverty line in developing and underdeveloped countries and, even in developed countries, there are many people living at the poverty level, as defined in their respective countries. Many scholars have explored the factors causing poverty. Arshed, Alamgir, and Aziz (2017), explained that family size, level of education and job characteristics are three things which can force an individual to be poor. As Goldsmith and Blakely in 1991 stated, “There are three different categories of poverty in which people are living i.e. poverty caused by disease, poverty caused by some tragic incident and poverty caused by the system” (W. Goldsmith & Blakely, 1991, p. 18). However, Rank has a different point of view as he says that “The concentration on individual characteristics as a cause of poverty is misdirected.” (Rank, 2004, p. 79). However, historically researchers and scholars paid less attention to poverty and even the definition of entrepreneurship was not discussed in the context of poverty. Scholars have been trying to explain entrepreneurship in various perspectives. Schumpeter (1942) developed the idea of creative destruction which is the process of destroying something by bringing something new at its place. Shane and Venkataraman (2000) discussed the opportunities utilized by entrepreneur or an individual to

create future goods and services. Rindova, Barry, and Ketchen (2009) give a slightly different concept of entrepreneuring as the effort by an individual to bring new cultural, social and economic environment. McMullen (2011) identified that market-based approach can help a person to overcome poverty. Schumpeter proposed the concept of "creative destruction" to explain the market dynamics where firms or individuals engage each other in a competition. Such competition is good for economic benefit and growth (Schumpeter, 1934). An efficient business environment will enhance the productivity of the firms which will create more jobs and economic growth (Ahlstrom, 2010). The remarks of Schumpeter on ineffective allocation of investments is that, "Add successively as many mail coaches as you please, you will never get a railway..." (Schumpeter, 1934, p. 64). New business enterprises and innovation plays a vital role for the development of economic growth and alleviating poverty (Schumpeter, 1934; Sombart, 2013).

### **2.1. Relationship between Entrepreneurial Activity and Poverty**

According to Spencer and Gómez (2004) and Wennekers and Thurik (1999), there are many variables which have cause and effect relationship with both entrepreneurial activity and economic development. Similarly, at the country level it is difficult to develop a model which can determine the causality between the entrepreneurial activity and economic development. Minniti (2013) explained that usually there are two types of studies that have been done on entrepreneurial activity and economic development. Some studies have illustrated that better entrepreneurial activity will enhance economic growth (Acs & Storey, 2004; Audretsch & Keilbach, 2004; Karlsson, Friis, & Paulsson, 2004; Schramm, 2004; Wennekers & Thurik, 1999) whereas other studies illustrated that better economic development will increase the level of entrepreneurial activity (Carree, Stel, Thurik, & Wennekers, 2007; Grilo & Irigoyen, 2006; Hessels, Gelderen, & Thurik, 2008). Moreover, in developed countries there is a significant impact of entrepreneurial activity on the economic development (Acs & Amorós, 2008; Stel, Carree, & Thurik, 2005; Tang & Koveos, 2004; Wennekers, Wennekers, Thurik, & Reynolds, 2005). Minniti (2013) studied the relationship between entrepreneurial activity and poverty. Usually in developing countries, poor people with less income or no income will shift from small labor jobs towards self-employment where they can improve their standard of life. According to Naudé (2010), there are more entrepreneurs in low-income or poor countries. As S. Shane stated, "...if you want to find countries where there are a lot of entrepreneurs, go to Africa or South America" (S. Shane, 2009, p. 143). Similarly, Banerjee and Duflo (2007, p. 151) discussed that "All over the world, a substantial fraction of the poor act as entrepreneurs in the sense of raising capital, carrying out investment, and being the full residual claimants for the resulting earnings."

### **2.2. Determining the Influence of Entrepreneurial Activity on Poverty Alleviation**

To determine the impact of entrepreneurial activity on poverty, there is a need to establish an appropriate dependent variable to measure poverty and to investigate its relationship with entrepreneurial activity. In many cases, Gross National Income (GNI) is proposed as a measure of poverty (Todaro & Smith, 2003). However, GNI has some weaknesses and is not a good indicator to measure the standard of life, which plays an important role in the development of entrepreneurial activity. Capelli and Vaggi (2013) argued that Gross National Income (GNI) is not a good indicator to measure the standard of living. For example, in the case of developing countries, it does not recognize foreign remittances which is one of the main impact on the growth of economy. Foreign remittances has a significant impact on the purchasing power of the people living in developing countries. An alternative measure that potentially offers a better fit is the Human Development Index (HDI). Human Development Index is comprised of GNI, education, health and standard of life which makes it a better choice to be used as a proxy to

measure poverty. The concept of human development includes the endeavors of government officials to improve the health services, social security, education and standard of living. Such efforts can create an environment for people to maximize their potential and have a superior and innovative life (Monsef, Sameti, & Mojahednia, 2011). Moreover, human development is not just about the expansion of a nation's economy. It is about allowing people to learn new skills, gain knowledge, get required resources to improve their life style and enjoy healthy life. Better health will allow people to increase their capacity to accomplish their goals and improve the standard of their life, whereas education will help people to learn new skills and knowledge and allow them to exploit opportunities for profit. The UNDP methodology identified four types of economies and in this study, the countries have been segmented on the basis of their HDI value:

- High-Income Countries (a value of 0.800 and above)
- High Medium-Income Countries (0.700 – 0.799)
- Medium-Income Countries (0.550 – 0.699)
- Low-Income Countries (Below 0.550)

According to Todaro and Smith (2003), high-income countries have high HDI. Because high-income level will allow people to have better life, education and health. Similarly high level income brings productivity in a country which raises the economic growth. According to Georgiou (2009a), entrepreneurial activities such as trade openness, services in hospitals, economic growth and education can improve HDI.

### **3. DATA AND METHODOLOGY**

#### **3.1. Research Objectives**

The objective of this study is to investigate the role of entrepreneurship activity as measured by new business density and its impact on poverty alleviation. The objectives are:

- To examine the impact of entrepreneurial activity on poverty alleviation.
- To get an insight into how entrepreneurship facilitators (Government, Incubators, and Financial Institutions) impact the business environment of a country which ultimately plays an important role in alleviating poverty.
- To identify the relationship between entrepreneurship facilitators (Government, Incubators, and Financial Institutions) and their role in poverty alleviation by comparing both overall and in the differing cases of high-income countries, high medium-income countries, medium-income countries and low-income countries.
- To illustrate the role of entrepreneurship facilitators in developing a mechanism to support a person in the process of becoming an entrepreneur. That mechanism of entrepreneurship facilitator will generate more jobs and reduce poverty.
- To identify other controlling factors that influence poverty and Human Development Index (HDI)?

#### **3.2. Research Questions**

1. What is the impact of entrepreneurial activity on poverty alleviation both overall and in the differing cases of high-income, high medium-income, medium-income and low-income countries?
2. Do entrepreneurship facilitators increase the effectiveness of entrepreneurship activity to reduce poverty?
3. What other controlling factors exists which can significantly affect poverty?

### 3.3. Research Hypothesis

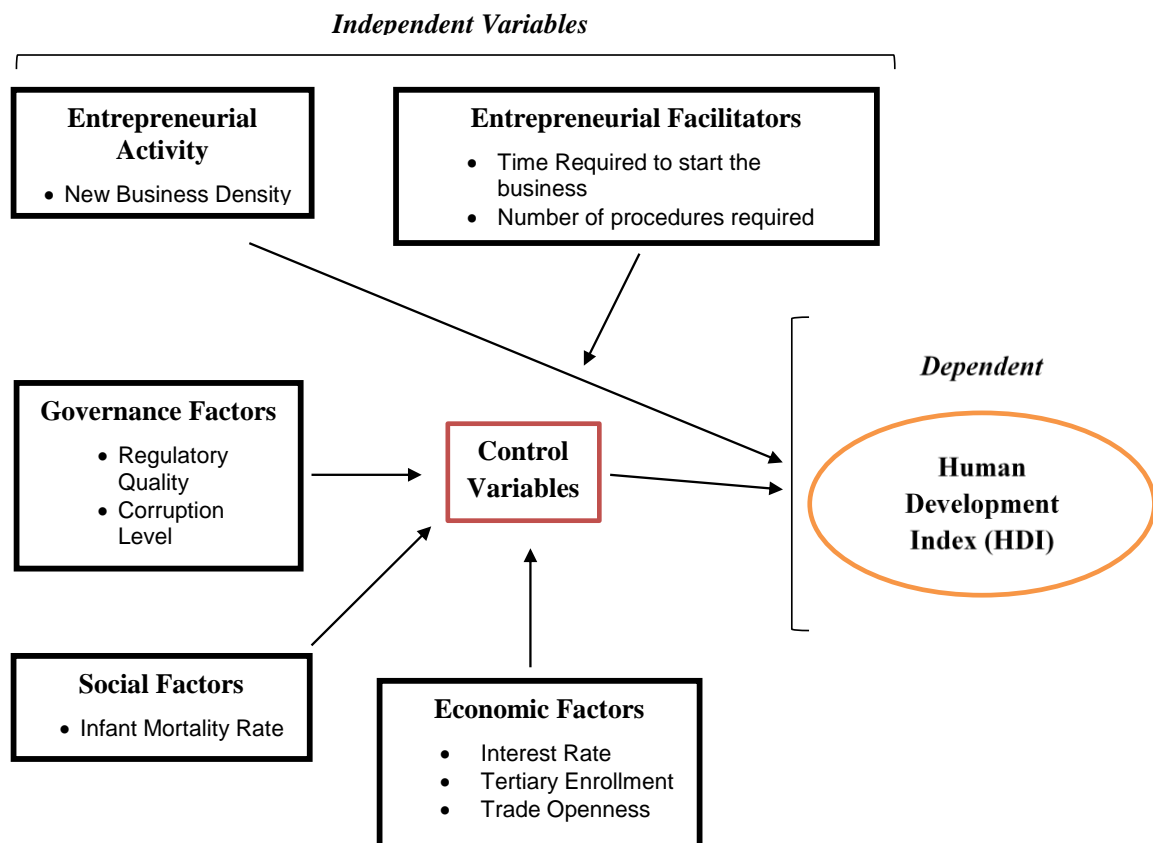
The aim of the current study is to investigate the role of entrepreneurship facilitators in alleviating poverty in high-income, high medium-income, medium-income, and low-income countries. Specifically, to answer the questions as stated in the previous section, the current study tests the following hypotheses:

- H<sub>1o</sub>: There is no significant relationship between entrepreneurial activity and poverty as measured by the Human Development Index (HDI).  
 H<sub>1a</sub>: There is significant relationship between entrepreneurial activity and poverty as measured by the Human Development Index (HDI).  
 H<sub>2o</sub>: Entrepreneurial facilitators as measured by (average of time required to start the business, number of procedures required and cost to start a business) have no significant impact on the relationship between entrepreneurial activity and poverty as measured by the Human Development Index (HDI).  
 H<sub>2a</sub>: Entrepreneurial facilitators as measured by (average of time required to start the business, number of procedures required and cost to start a business) have significant impact on the relationship between entrepreneurial activity and poverty as measured by the Human Development Index (HDI).

### 3.4. Theoretical Model

Figure 1 presents the theoretical framework of the study and demonstrates the potential effect of entrepreneurial activity on Human Development Index (HDI). Additionally, Figure 1 illustrates the moderating effect of the entrepreneurial facilitators on the effects of entrepreneurial activity. The controlling factors come from three groups such as economic, social & governance related factors.

Figure 4: Theoretical Model





### 3.5. Research Design

This study uses a deductive approach, in which the hypotheses are tested for application across various country groups based on their development level. For this approach secondary quantitative data are used (Gabriel, 2013).

### 3.6. Data and Sample

The annual time series data of Entrepreneurial Activity, Entrepreneurial Facilitators, Social Factors, Economic Factors, Government Factors and Human Development Index (HDI) were collected for the period of 2005 to 2016 from the United Nations Development Programme (UNDP, 2018) and World Development Indicators (World Bank, 2018) for all countries in the world and are used as a proxy to measure poverty in the countries categorized as high-income, high medium-income, medium-income and low-income countries, respectively.

### 3.7. Estimation Equation

In order to fulfill the research objectives this study estimates the following model,

$$HDI_{it} = \alpha_0 + \alpha_1 EA_{it} + \alpha_2 EF_{it} + \alpha_3 GOV_{it} + \alpha_4 ECO_{it} + \alpha_5 SOC_{it} + \varepsilon_{it}$$

### 3.8. Estimation Approach

Panel Generalized Least Square was chosen, which helps to investigate the unknown factors in a linear regression model when there is a relationship between residuals in model (Zoltan J. Acs, Audretsch, Braunerhjelm, & Carlsson, 2012; S. Miller & Startz, 2018).

## 4. RESULTS AND THEIR ANALYSIS

As discussed earlier, the annual time series data of Human Development Index (HDI) were collected for the period of 2005 to 2016 from United Nations Development Programme (UNDP, 2018). Human Development Index (HDI) is used as a proxy to measure poverty in both all countries in the world and their sub group such as: high-income, high medium-income, medium-income and low-income countries. Thus, the dependent variable is Human Development Index (HDI) and the independent variable is entrepreneurial activity. Entrepreneurial facilitators is used as a moderator in between entrepreneurial activity and HDI. Moreover, governance factors, social factors, and economic factors are used as a control variable. The results for all countries and their sub sets are shown in Table 1.

*Table 8: Relationship between Human Development Index (HDI) and Independent Variables*

Results of All Countries							
Variables		Symbol	High-Income Countries	High Medium-Income Countries	Medium-Income Countries	Low-Income Countries	All Countries HDI
Entrepreneurial Activity	New Business Density	busn	+ve/sig	+ve/ sig	+ve/sig	+ve/sig	+ve/sig
Entrepreneurial Facilitators	Cross product of new business density and cost of starting new business	busn*cost	-ve/sig	-ve/sig	-ve/sig	-ve/sig	-ve/sig
Control Variable	Trade Openness	open	-ve/sig	-ve/sig	-ve/insig	+ve/sig	-ve/insig
Control Variable	Tertiary Enrollment	edu	+ve/sig	+ve/sig	+ve/sig	+ve/sig	+ve/sig
Control Variable	Governance Factor	gov	+ve/sig	+ve/sig	+ve/sig	-ve/sig	+ve/sig
Control Variable	Interest rates	lr	-ve/sig	-ve/sig	+ve/sig	+ve/sig	+ve/sig
Control Variable	Mortality Rate	mor	-ve/sig	-ve/sig	-ve/sig	-ve/sig	-ve/sig

#### **4.1. Entrepreneurial Activity**

Table 1 shows the relationship between HDI and independent variables. Entrepreneurial activities comprise of new business density, where new business density is the total number of business registration. This shows that entrepreneurial activities increase with an increase in new business density. More business registration will bring more employment in a country. This means that more businesses registered will allow people to improve their standard of life. The purchasing power will also increase with the increase of new business registration. The results showed that entrepreneurial activity have positive and significant impact on HDI in all countries in the world and as well as in their sub groups high-income, high medium-income, medium-income and low-income countries.

#### **4.2. Entrepreneurial Facilitators**

The Entrepreneurial facilitators variable is a cross product of new business density and cost of starting new business. Cost of starting a business is an average of three costs which are time required to start a business, number of procedures required and cost of starting a business. It is assumed that when the cost to start a business increases, it may demotivate entrepreneurs and reduce the impact of new businesses registered on HDI. Fewer entrepreneurs will start businesses if they have to bear higher cost of starting a businesses. Cost of Starting a business can be high if entrepreneurs have bear long documentations and procedures to register their businesses which may demotivate few entrepreneurs. Furthermore, entrepreneurship facilitators can be effected by the role of government regulations, interest rates, health facilities, and economic policies (exports and imports). This suggests that entrepreneurial facilitators play a vital role in the growth of new business density.

#### **4.3. Summary**

The results show that there is positive and significant impact of entrepreneurial activity on HDI across all countries in the world and in sub sets classified by stage of economic development. Moreover, entrepreneurship facilitators increase the effectiveness and capacity of entrepreneurial activity to reduce poverty. Furthermore, controlling factors such as trade openness, tertiary enrollment, governance factor, interest rates and mortality rate have significant effect on poverty. This suggests that governments should improve the quality of their regulations and reduce the procedures and time delays for registering a business. In developong nations, this may reduce the corruption level and allow entrepreneurs to more easily fulfill the documentation requirements. Moreover, consistency in economic growth will attract foreign investors. Furthermore, by improving health services, investing on education, improving the quality of legislations, government can motivate people to become entrepreneur which will be a step in reducing the ratio of extreme poverty in a country. Better health will allow people to increase their capacity to accomplish their goals and improve the standard of their life. If people are not healthy then they will be less able to participate in any business activity.

#### **5. CONCLUSION**

Overall this research project has demonstrated that there is a significant and positive relationship between entrepreneurial activity and poverty reduction as measured by changes in the Human Development Index (HDI). Moreover, the results show that entrepreneurial facilitators as measured by (average of time required to start the business, number of procedures required and cost to start a business) have significant impacts on the relationship between entrepreneurial activity and poverty alleviation as measured by HDI. The study findings demonstrate that entrepreneurial activity has direct and significant effect on HDI for all countries. Moreover, estimated results suggest that the moderating role of entrepreneurial

facilitators like cost to start a business have inverse and significant relationship with HDI in case of all countries. Results also conclude that governance factors have direct and statistically significant relationship with HDI. Further, social factors including infant mortality rate are inversely related to HDI. Meanwhile, economic indicators including interest rate, tertiary enrollment, and trade openness are directly influencing the HDI. Governance factor is directly related with HDI.

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# IS THE EXPECTED UTILITY- ENTROPY DECISION MODEL FOR STOCK SELECTION APPLICABLE ON EMERGING CAPITAL MARKETS?

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## **ABSTRACT**

*Capital markets in developing countries, known as emerging capital markets, represent a significant part of the financial markets area and are extremely attractive for investors. Although emerging capital markets provide great opportunities for investors, they are also limited in some ways: low level of liquidity, reduced capitalization, high transaction cost and low transparency. For that reason, investing markets need to be thoroughly analyzed in order of choosing the best strategy and the investment policy. Often, models for investment portfolio management, which give good results in developed capital markets, don't give the same results in the emerging capital markets. In this paper we apply the expected utility-entropy (EU-E) decision model for selecting the set of stocks to be included in the portfolio in Croatian capital market. The mentioned market belongs among emerging capital market. This model combines the decision-maker's subjective preference and the objective uncertainty regarding the states of nature, in which the decision-maker's subjective preference is reflected by the expected utility; the objective uncertainty is measured using Shannon entropy. This model was proven useful in stock selection for investors in developed capital markets. The efficient portfolio of stock selected by the EU-E decision model have almost the same efficient frontier as the sample of all stocks. It will be tested if this model gives the same results in emerging capital markets.*

**Keywords:** *Emerging capital markets, expected utility-entropy decision model, stock selection*

## **1. INTRODUCTION**

Contemporary conditions on turbulent financial markets today put great demands on the process of investment portfolio management. In this paper, we investigate if the expected utility-entropy (EU-E) decision model can simplify and facilitate the processes of portfolio selection on emerging capital market. The proposed model for selecting stocks is based on two criteria: entropy and expected utility. Entropy was initially implemented in thermodynamics by Clausius (1870). Later Shannon (1948) showed that entropy concept can be applied in areas of science where probabilities can be determined. In finance entropy is viewed as a measure of dispersion, a generalization of variance (Backus et al. 2014). Unlike the variance that measures concentration only around the mean, the entropy measures diffuseness of the density irrespective of the location of such concentration. In the statistical sense, the entropy is not a frequentist mean-centred measure, but the measure taking into account the entire empirical distribution without concentrating on a specific statistical moment (Deeva, 2017). According to Ormos and Zibriczkyd (2014) implementing entropy in the asset pricing model allows dismissing the restriction on returns' normality distribution. The results of their study show that entropy yields a similar amount of diversification effects as standard deviations, confirming its ability as an appropriate risk measure. In their regression analyses, they found that entropy has higher explanatory power for the expected return than the capital asset pricing model. Deeva, (2017) also applies entropy in asset pricing and her analysis based on European data

demonstrates that the kernel density based entropy is a worthy option for the risk measure performing better than the CAPM beta. Furthermore, Shannon entropy has been widely used in portfolio selection models. The first model for portfolio optimization has been developed in 1952 by H.M. Markowitz and with that model he laid the foundation of the modern portfolio theory (Markowitz, 1952). His model is based upon two criteria: return and risk. The risk is measured by the variance of returns' distribution. Markowitz shows how to calculate portfolio which has the highest expected return for a given level of risk, or the lowest risk for a given level of expected return (the so-called efficient portfolio). Since then, many portfolio selection models are developed. Having recognized the drawbacks of variance as a risk measure, new models for the selection of optimal portfolio which use alternative measures, like lower-partial risk measures, Value-at-Risk, Conditional Value-at-Risk and entropy, have been developed (Philappatos and Wilson 1972; Konno et al., 2002; Rockafaller and Uryasev, 2000; Yau et al. 2011). Philappatos and Wilson (1972) and Philappatos and Gresis (1975) used entropy as a risk measures in portfolio selection model. They found that mean-entropy portfolios are also mean-variance efficient. Most importantly, the use of mean-entropy criteria is preferred to mean-variance as it is not constrained to any particular distribution. Usta and Kantar (2011) developed a multi-criteria portfolio selection model in which an entropy measure was one of the four criteria. They evaluated the performance of the mean-variance-skewness-entropy model (MVSEM) in terms of several portfolio performance measures. They found that MVSEM performs well out-of sample relative to traditional portfolio selection models. Yang and Qiu (2005) and (2014) mixed entropy and expected utility and they developed a decision-making model under risk, the expected utility-entropy (EU-E) decision-making model. EU-E model combine the decision-maker's subjective preference and the objective uncertainty of the state of nature. The decision-maker subjective preference is reflected by the expected utility and the objective uncertainty is measured using Shannon entropy. In this model, the measure of risky action is the weighted linear average of expected utility and entropy using a risk trade-off factor. Yang et al. (2017) applied Yang and Qiu model from 2014 with normalized EU-E measure of risk to stock selection, i.e., selecting the set of stocks with lowest EU-E measure of risk for trade-off coefficients within certain intervals, and then derive the efficient portfolios using these sets of stocks in the mean-variance framework proposed by Markowitz. They applied EU-E model on developed capital markets and shown that EU-E decision model can be a useful method for stock selection. The results show that efficient portfolios composed of the set of stocks selected using EU-E model are more efficient than that of the set of stocks selected using only expected utility criterion. Moreover, the efficient frontiers of portfolios for intermediate values of  $\lambda$  are almost the same as that of portfolios composed from the sample of all stocks. In our study we investigate if the expected utility- entropy decision model for stock selection gives the same results in emerging capital markets which are characterized by higher expected returns and risk. The rest of paper is organized as follows: in Section 2 we describe the normalized EU-E measure of risk and decision model. Section 3 presents the results of the empirical analysis on Croatian capital market while Section 4 gives conclusions.

## 2. EU-E MEASURE OF RISK

Risk is indispensable part of every decision model. According to the context, risk can have many interpretations. Moskowitz and Bunn (1987) defined risk as the possibility of an unfavorable outcome. For the notion of risk in decision analysis, Yang and Qiu (2005) explain that there are two main factors that determine the decision maker's choice of an action: one is the uncertainty of outcomes resulting from uncertainty of occurrence of state; another is decision maker's expected utility when taking a certain action. Therefore, they took these two sides into account. The higher the uncertainty is, the higher the riskiness; the higher the expected utility of an action, the less the riskiness.

According to these two factors of riskiness, Yang and Qiu (2005) proposed risk measure composed of expected utility of an action as the measure of decision maker's subjective expectation, and entropy of the distribution of its corresponding state as the measure of uncertainty of the state of nature. They named this measure of risk as the expected utility-entropy (EU-E) measure of risk. Definitions of general decision analysis model and EU-E measure of risks follow.

Given finite action space  $A = \{a_1, a_2, \dots, a_m\}$  and finite state of nature space  $\Theta = \{\theta_1, \theta_2, \dots, \theta_n\}$ . For an action  $a_i \in A$ , the state  $\theta_i$  corresponding to  $a_i$  has  $n_i$  outcomes and its corresponding state space is  $\theta_i = \{\theta_{i1}, \theta_{i2}, \dots, \theta_{in_i}\}$ . For each  $i \in \{1, 2, \dots, m\}$  and  $j \in \{1, 2, \dots, n_i\}$   $p_{ij} = P\{\theta = \theta_{ij} | a = a_i\}$  denotes the probability that state  $\theta_{ij}$  occurs when taking action  $a_i$ . For all  $i \in \{1, 2, \dots, m\}$ ,  $\{p_{ij}\}$  is distributive law of  $\theta_i$ , where  $\sum_{j=1}^{n_i} p_{ij} = 1$ ,  $p_{ij} \geq 0$ . If the payoff when taking action  $a_i$ , while state  $\theta_{ij}$  occurs, is defined as function  $X = X(a_i, \theta_{ij}) = x_{ij}$  for  $A \times \Theta$ , the decision maker's utility function is  $u = u(X)$  and the general analysis model can be written as  $G = (A, u)$ .

Entropy used in presenting EU-E model is defined by Shannon (1948) as the measure of amount of uncertainty in a probability distribution. For an action  $a$  and its corresponding state of nature  $\theta$ , with  $n$  possible outcomes, described as discrete variable with a set of probabilities  $p_1, p_2, \dots, p_n$ , the entropy of  $\theta$  is defined as:

$$H_a(\theta) = -\sum_{i=1}^n p_i \ln p_i \quad (1)$$

Yang and Qiu (2014) normalized entropy defined as:

$$NH_a(\theta) = \begin{cases} \left(-\sum_{i=1}^n p_i \ln p_i\right) / \ln(n), & n > 1 \\ 0, & n = 1 \end{cases} \quad (2)$$

In the further work normalized entropy of state of nature  $\theta$  corresponding to action  $a$  is denoted with  $H_a(\theta)$ . The  $H_a(\theta)$  satisfies:

$$0 \leq H_a(\theta) \leq 1$$

A value  $H_a(\theta) = 1$  presents the maximum uncertainty reaches when the state of nature is discrete variable with uniform distribution and  $n$  possible outcomes, i.e.  $p_i = 1/n$ ,  $\forall i \in \{1, 2, \dots, n\}$ . A value  $H_a(\theta) = 0$  implies no uncertainty, i.e.  $((\exists i \in \{1, 2, \dots, n\}) p_i = 1) \wedge ((\forall j \in \{1, 2, \dots, n\}) j \neq i \rightarrow p_j = 0)$ . According to previous, a risk-averse decision maker would choose an action  $a$  with the smaller relative uncertainty described with the smaller normalized entropy. It should be noted that not all decision makers are only looking for increasing uncertainty, some of them may wish to reduced uncertainty as well as increase expected utility of an action.



This assumption leads to using EU-E as appropriate measure of risk.

Given general analysis model  $G = (\Theta, A, u)$ , action  $a \in A$  and state of nature  $\theta \in \Theta$ . Suppose  $|A| > 1$ ,  $u(X) \geq 0$  and  $\max_{a \in A} \{E[u(X(a, \theta))]\}$  exists. If  $\max_{a \in A} \{E[u(X(a, \theta))]\}$  is nonzero, the measure of risk when taking action  $H_a(\theta)$ , denoted with  $R(a)$ , is defined as:

$$R(a) = \lambda H_a(\theta) - (1 - \lambda) E[u(X(a, \theta))] / \max_{a \in A} \{E[u(X(a, \theta))]\}, \quad \lambda \in [0, 1]. \quad (3)$$

When  $\max_{a \in A} \{E[u(X(a, \theta))]\}$  is zero, the measure of risk when taking action  $a$  is fully described with  $H_a(\theta)$ , i.e.

$$R(a) = H_a(\theta).$$

$R(a)$  is called expected utility-entropy (EU-E) measure of risk of an action  $a$ .

For a previously defined Shannon entropy  $H_a(\theta)$ ,  $R(a)$  could be written as:

$$R(a) = -\lambda \sum_{i=1}^n p_i \ln p_i / \ln(n) - (1 - \lambda) E[u(X(a, \theta))] / \max_{a \in A} \{E[u(X(a, \theta))]\}, \quad (4)$$

Where  $p_1, p_2, \dots, p_n$  denotes probabilities for  $n$  possible outcomes of state of nature  $\theta$ .

In the definition of  $R(a)$ , the constant  $\lambda$  is called tradeoff constant. It defines the proportion of decision maker's subjectivity described with expected utility, and objective uncertainty of corresponding states. The value of  $\lambda$  is specific to an individual. With increasing the impact of expected utility in individual's decisions,  $\lambda$  approaches to 0. On the other hand, if the impact of expected utility is decreasing, resulting with increasing impact on objective uncertainty, i.e. entropy,  $\lambda$  approaches to 1. We differentiate two marginal states: if the expected utility of all actions is the same, the riskiness of each action is measure with entropy and  $\lambda$  is equal to 1; if all states of nature have the same distribution (i.e. entropy of the state is the same for every state of nature correspondent to each action), then the riskiness of each action is determined with expected utility and  $\lambda$  is equal to 0. This statements are derived by Luce (1980), and they leads to following properties of EU-E measure of risk (Yang and Qiu, 2005). If  $G = (\Theta, A, u)$  is general analysis model,  $a_1, a_2 \in A$ ,  $a_1 \neq a_2$  actions and EU-E riskiness measure, then:

$$E[u(X(a_1, \theta))] = E[u(X(a_2, \theta))] \wedge H_{a_1} < H_{a_2} \Rightarrow R(a_1) < R(a_2)$$

$$H_{a_1} = H_{a_2} \wedge E[u(X(a_1, \theta))] > E[u(X(a_2, \theta))] \Rightarrow R(a_1) < R(a_2)$$

Furthermore, EU-E measure of risk allows ranking the action in action spaces. Following relations of an actions are defined by Yang and Qiu (2004) and ther determine the EU-E decision model.

For previously defined actions  $a_1, a_2 \in A$ ,  $a_1 \neq a_2$ , we differentiate three states:

$R(a_1) < R(a_2) \Rightarrow$  action  $a_1$  is preferred to action  $a_2$ , denoted with:

$$a_1 \succ a_2 \Leftrightarrow R(a_1) < R(a_2)$$

$R(a_1) \leq R(a_2) \Rightarrow$  action  $a_2$  is not superior to action  $a_1$ , denoted with:

$$a_1 \succeq a_2 \Leftrightarrow R(a_1) \leq R(a_2)$$

$R(a_1) = R(a_2) \Rightarrow$  action  $a_1$  and  $a_2$  are indifferent, denoted with:

$$a_1 \square a_2 \Leftrightarrow R(a_1) = R(a_2)$$

If  $(\exists a^* \in A) R(a^*) = \min_{a \in A} \{R(a)\}$  then  $a^*$  is an optimal action. Previously defined relations are in the sense of EU-E measure of risk. The EU-E measure of risk, as weighted linear average of normalized expected utility and entropy, provides a quantified measure of an individual perception of an action's risk. It was built on the fact that decision makers are seeking for less uncertainty and bigger expected utility. Tradeoff coefficient  $\lambda$  allows that decision makers may distinguish relative uncertainty and expected utility, while evaluation of the risk. As such, EU-E measure is appropriate measure for stock selection.

## 2.1. EU-E decision model applied to stock selection

Given a set of stock, with the aim of constructing a subset consists of stock with lowest risk, according to previously defined EU-E measure of risk, the following applicable model is constructed:

$S = \{S_1, S_2, \dots, S_m\}$  -set of stocks,

$A = \{a_1, a_2, \dots, a_m\}$  -action space,  $a_i$  -action of selecting stock  $S_i$ ,  $i \in \{1, 2, \dots, m\}$ ,

$\{r_{i1}, r_{i2}, \dots, r_{iq}\}$  - returns of stock  $S_i$  for  $q+1$  previous days,  $i \in \{1, 2, \dots, m\}$ ,

$[a, b]$ ,  $a = \min_{1 \leq i \leq m} \{r_{i1}, r_{i2}, \dots, r_{iq}\}$ ,  $b = \max_{1 \leq i \leq m} \{r_{i1}, r_{i2}, \dots, r_{iq}\}$ ,

$$\Delta r = (b - a)/n, \quad n \in \mathbb{N} \Rightarrow r_i := \begin{cases} a & , i = 0 \\ r_{i-1} + \Delta r, & i \in \{1, 2, \dots, n-1\} \\ b & , i = n \end{cases}$$

$\Theta = \{\theta_1, \theta_2, \dots, \theta_n\}$  -state space,  $\theta_j = [r_{j-1}, r_j)$ ,  $j = 1, 2, \dots, n$ ,

$(\forall i \in \{1, 2, \dots, m\})(\forall j \in \{1, 2, \dots, n\}) \rho_{ij} := \left| r_{il} \in \{r_{i1}, r_{i2}, \dots, r_{iq}\} : r_{il} \in \theta_j \right| / q$ ,

$$(\forall i \in \{1, 2, \dots, m\})(\forall j \in \{1, 2, \dots, n\}) \bar{x}_{ij} := \frac{\sum_{r_{ij} \in \theta_j} r_{ij}}{\rho_{ij}},$$

Bernoulli's LLN:  $q \rightarrow \infty \Rightarrow \rho_{ij} \rightarrow p_{ij}$ .

$p_{ij}$  - probability that the return of stock  $S_i$  will take an expected value of  $\bar{x}_{ij}$  within interval  $\theta_j$   
 Risk measure of investing stock  $S_i$  is defined as:

$$R(a_i) = -\lambda \sum_{i=1}^n \rho_{ij} \ln \rho_{ij} / \ln(n) - (1-\lambda) \sum_{j=1}^n [u(\bar{x}_{ij}) \rho_{ij}] / \max_{1 \leq i \leq m} \left\{ \sum_{j=1}^n [u(\bar{x}_{ij}) \rho_{ij}] \right\}, \quad (5)$$

$$u(x) = \begin{cases} 1 - e^{-x}, & x \geq 0 \\ -\lambda(1 - e^x), & x < 0 \end{cases} \text{ - exponential-type S-shaped utility function.} \quad (6)$$

According to different values of  $R(a_i)$ ,  $i \in \{1, 2, \dots, m\}$  it is possible to select  $k$  stocks with the lowest riskiness. Utility function used in previous model is made from two types of functions: S-shaped utility function and exponential utility function. S-shaped utility function describes human behavior in decision-making related to the fact that for human, utility is defined on deviations from the reference point. According to previous Kahneman and Tversky (1979) describe utility function, in a case of gains, as normally concave. In a case of losses it is commonly convex and more steeper than for gains. In this model, reference point is described with the return equal to zero, meaning utility function is equal to zero when the stock return is zero. Furthermore,  $\lambda \geq 1$  reflects that change in utility value is steeper for than for gains. This statements imply that most investors are risk averse for gains and risk seeking for losses. On the other hand, exponential utility is commonly used in economics and decision analysis (Bouakiz and Sobel, 1992), Chen et al. (2007)).

### 3. STOCK SELECTION ON CROATIA MARKET USING EU-E MEASURE OF RISK

We apply previously presented EU-E decision model for stock selection on Croatian stock market. According to EU-E risk measure we are sorting stocks in initial set in ascending order. Then we are trying to maximum reduce initial set, so the generated subset, consisted of stocks with the lowest EU-E risk, is sufficiently good approximation of initial set in the sense of mean-variance model. Initial set  $S$  is made of stocks which are components of Croatian market index CROBEX. The CROBEX components are most traded stocks on the Croatian stock market during a standard trading season. In December 2018 CROBEX included  $m = 18$  stocks shown in the Table 1. Furthermore, we collect the daily closing prices of CROBEX stocks over the period of January 2017 to December 2018, resulting with  $q + 1 = 497$  closing prices  $\{P_{i0}, P_{i1}, \dots, P_{i496}\}$  for each component stock  $S_i$ ,  $i \in \{1, 2, \dots, 18\}$ .

Variable	Stock Company	Variable	Stock Company	Variable	Stock Company
$S_1$	AD PLASTIK	$S_7$	Dalekovod	$S_{13}$	MAISTRA
$S_2$	Adris grupa	$S_8$	Ericsson Nikola Tesla	$S_{14}$	Ot-optima telekom
$S_3$	Arena Hospitality Group	$S_9$	HT	$S_{15}$	Podravka
$S_4$	Atlantic grupa	$S_{10}$	Ingra	$S_{16}$	Valamar Riviera
$S_5$	Atlantska plovdba	$S_{11}$	Končar, d.d	$S_{17}$	Brodogradilište Viktor Lenac
$S_6$	Đuro Đaković grupa	$S_{12}$	Kraš	$S_{18}$	Zagrebačka banka

Table 9: The components of CROBEX (www.zse.hr)

Then we calculate  $q = 496$  returns  $\{r_{i1}, r_{i2}, \dots, r_{i496}\}$  by using formula:

$$r_{ij} = \ln \frac{P_{ij}}{P_{i,j-1}}, \quad i \in \{1, 2, \dots, 18\}, \quad j \in \{1, 2, \dots, 496\}$$

After finding minimum  $a = -0.192573$  and maximum  $b = 0.342742$  of all stock returns, we construct interval  $[-0.192573, 0.342742]$  which collects all stock returns, and then we divide it into  $n = 20$  sub-intervals  $[-0.192573, -0.09), [-0.09, -0.08), [-0.08, -0.07), \dots, [0.08, 0.09), [0.09, 0.342742)$  denoted with  $\{\theta_1, \theta_2, \dots, \theta_{20}\}$ . Then we calculate expected return  $\bar{x}_{ij}$  and relative frequency  $\rho_{ij}$  of stock  $S_i$  within interval  $\theta_j$ ,  $i \in \{1, 2, \dots, 18\}$ ,  $j \in \{1, 2, \dots, 20\}$ . According to  $q = 496$  returns, Bernoulli's theorem allows using  $\rho_{ij}$  as estimation of  $p_{ij}$ . Thus, we have probability distribution of each sample stock. Using equation (2) and equation (6) we calculate entropy and expected utility of each stock  $S_i$ ,  $i \in \{1, 2, \dots, 18\}$ . Using equation (5) we calculate EU-E measure of risk of selecting each stock  $S_i$ ,  $i \in \{1, 2, \dots, 18\}$  when the value of  $\lambda$  varies from 0 to 1. According to different risk measures of selecting each stock, for each value of  $\lambda$ , we rank those stocks in ascending order. The results are shown in Table 2.

$\lambda$	$Q_i$	$S_i$																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	1	2	8	13	1	9	18	17	11	7	10	12	14	3	15	6	4	16	5
0.05		2	8	13	1	9	18	17	10	6	11	12	14	3	16	7	4	15	5
0.1	2	2	7	13	1	10	18	17	9	5	11	12	14	3	16	6	4	15	8
0.15		2	6	13	1	10	18	17	9	5	11	12	14	3	16	7	4	15	8
0.2		2	6	13	1	11	18	17	9	5	12	10	14	3	16	7	4	15	8
0.25		2	6	13	1	11	18	17	9	4	12	10	14	3	16	7	5	15	8
0.3		1	6	11	2	12	18	17	9	4	14	10	13	3	16	7	5	15	8
0.35		1	6	11	2	13	18	17	9	4	14	10	12	3	16	7	5	15	8
0.4		1	6	11	2	13	18	17	9	3	14	10	12	4	16	7	5	15	8
0.45		1	6	11	2	13	18	17	8	3	14	10	12	4	16	7	5	15	9
0.5	3	1	5	11	2	13	18	17	8	3	14	9	12	4	16	7	6	15	10
0.55		1	5	11	3	13	18	17	8	2	14	9	12	4	16	7	6	15	10
0.6		2	4	10	3	13	18	17	8	1	14	9	11	5	16	7	6	15	12
0.65		2	4	10	3	13	18	17	8	1	14	9	11	5	16	7	6	15	12
0.7		2	4	11	3	13	18	17	8	1	14	9	10	6	16	7	5	15	12
0.75		2	3	11	4	13	18	17	9	1	14	8	10	6	16	7	5	15	12
0.8		3	2	11	4	13	18	17	9	1	14	8	10	6	16	7	5	15	12
0.85		3	2	10	4	13	18	17	11	1	14	7	9	6	16	8	5	15	12
0.9	5	3	2	8	5	13	18	17	11	1	14	6	7	9	16	10	4	15	12
0.95	6	3	2	7	8	13	18	17	9	1	15	6	4	11	16	10	5	14	12
1		5	2	6	9	14	18	16	8	1	17	4	3	11	15	10	7	13	12

Table 10: Shares ranking using EU-E risk measure (own calculation)

Furthermore, for different value of  $\lambda$ , we select the first nine stocks with the lowest EU-E risk and formed subsets of initial set, consisted of these stocks. In Table 1, for  $\lambda = 0$  and  $\lambda = 0.05$ , we can see that the subsets are formed by the same stocks, so we observed one subset  $Q_1 = \{S_1, S_2, S_4, S_5, S_9, S_{13}, S_{15}, S_{16}, S_{18}\}$  for  $\lambda \in [0, 0.05]$ , with assumption of equality of subsets for each value of  $\lambda$  within this interval. In the same way we define all subsets  $Q_1, Q_2, Q_3, Q_4, Q_5, Q_6$ . We use EU-E decision model to select stocks, and then we use Markowitz mean-variance model to construct efficient portfolios.

In mean-variance model, every portfolio is described with two criteria: expected return and standard deviation as measure of risk. Efficient portfolio is portfolio which has the highest expected return for a given level of risk, or the lowest risk for a given level of expected return. The efficient frontier consists of the set of all efficient portfolios (Marasović and Babić, 2011, p. 56). For each subset  $Q_1, Q_2, Q_3, Q_4, Q_5, Q_6$  we plot efficient frontier and compare each of them with efficient frontier of initial set  $S$ . Figure 1 consist of 6 graphs. Each graph presents efficient frontier of portfolios composed by one of subsets  $Q_1, Q_2, Q_3, Q_4, Q_5, Q_6$ , denoted with red line and initial set  $S$ , denoted with blue line. Comparing the results presented in those six graphs, we can see that efficient frontier of portfolios composed by set  $Q_3$  has the best performance according to the sample of all stocks. For fixed risk, expected return of efficient portfolios composed by set  $Q_3$  is nearly the same as expected return of efficient portfolios composed by initial set. These result suggests set  $Q_3$  as an appropriate approximation of initial set  $S$ , meaning we can reduce number of stocks without major changes in relation between risk and expected return.

*Figure following on the next page*

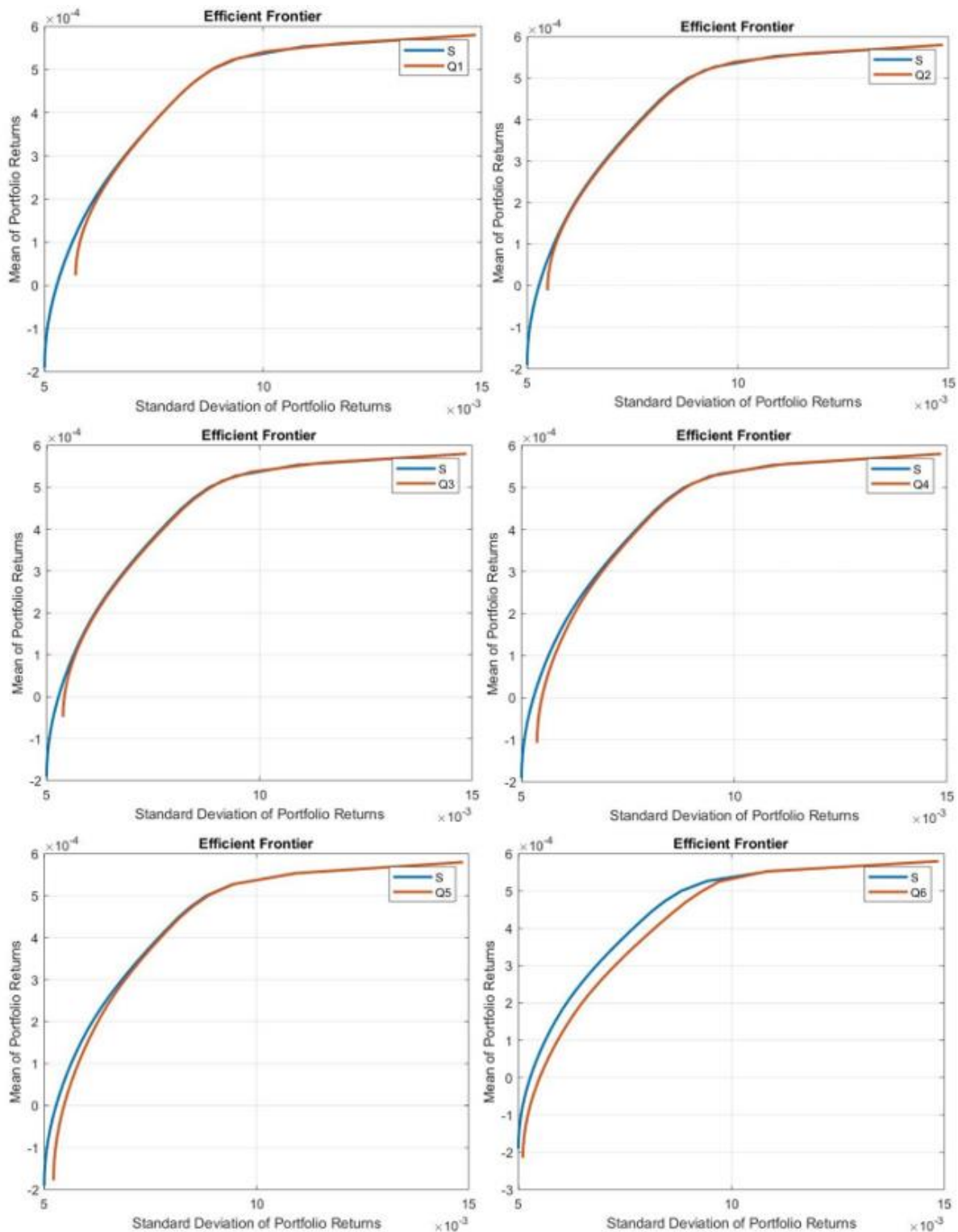


Figure 1: The results of comparison efficient frontiers (own construction)

#### 4. CONCLUSION

This paper presents the application of EU-E decision model for selecting the set of stocks to be included in the portfolio in Croatian capital market, as the example of emerging capital markets. This model was proven useful in stock selection in developed capital markets, where the subset made up of 23% stocks included in initial set have almost the same efficient frontier as the initial set. The main aim of the paper was to test if EU-E model gives the same results in emerging capital markets presented with Croatian capital market.

Initial set in the paper was formed out from components of CROBEX, and by applying EU-E we constructed the six subsets of initial set, for six different intervals of  $\lambda$ . The subsets were made of nine stocks with lowest EU-E riskiness, for given interval of  $\lambda$ . Then we compared efficient frontier of several portfolios, for different intervals of tradeoff coefficient  $\lambda$ , with efficient frontier of portfolios composed by initial set. Result of comparison was that efficient frontier of portfolios constructed by the set which matches the tradeoff coefficient  $\lambda \in [0.5, 0.8]$  has almost the same performance as an efficient frontier constructed of all the sample stocks. Furthermore, portfolios constructed by the set of stocks selected using an  $\lambda \in [0.5, 0.8]$  have better performance than those selected using lower and higher values of  $\lambda$ . For  $\lambda \rightarrow 0$  EU-E selection is based only on expected utility function and does not allow sufficient low risk rates as we get for  $\lambda \approx 0.05$ . On the opposite side, for  $\lambda \rightarrow 1$  selection is based only on Shannon entropy and for fixed risk we cannot get high enough expected return as we can get for  $\lambda \approx 0.05$ . These results confirm the importance of incorporating both the Shannon entropy and expected utility together in decision-making under risk. Inclusion into account investors' subjective expectation, described with utility function, and objective uncertainty of outcomes, presented with entropy, is useful method for stock selection on emerging capital markets. By using the EU-E decision model for selecting stock we managed to reduce the number of shares by 50% without major changing properties of efficient portfolios. In future research we suggest including transaction costs as the one of the factors for stock selection, considering that, on emerging capital markets, transaction costs can take on high values. Furthermore, taking into account unrealistic assumption of return's normal distribution, the variance, as risk measure, should be replaced with some other measure of risk. With all previous changes, we suggest results comparison on capital markets with different development.

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## SHARING TACIT KNOWLEDGE AND ORGANIZATIONAL LEARNING IN PORTUGUESE VOLUNTARY FIRE FIGHTERS CORPS

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### ABSTRACT

*The growing importance of the third sector and its institutions justifies the attention of the academic community, in order to establish and adopt best practices aimed at fulfilling its missions and reinforcing organizational learning. However, there are few studies on the importance of the intensity and availability for the sharing of tacit knowledge, as a form of organizational learning, directed to organizations of this typology. The option of conducting a case study such as the Portuguese fire brigades (FB's), unique in their action and identity, accompanies the need increasingly recognized by Portuguese society to enable these organizations to achieve the best performance to tragic events in recent years in this country. Thus, by placing the focus of the study on the intensity and availability of tacit knowledge sharing, and on past learning, by FB commanders in Portugal, we have identified as objectives, to identify if there is an intention and tacit knowledge sharing available to the commanders of FB's and realize if this intention and availability is matched in what is the treatment of knowledge obtained by past learning. Eight interviews were conducted with commanders of fire brigades in the central region of Portugal, under the snowball methodological technique, for a qualitative study. It was possible to conclude that the commanders of these FB's tend to demonstrate the intensity and availability of tacit knowledge sharing, but that this is not reflected in their practices derived from past learning. As limitations of the research, it should be noted that the present research focuses exclusively on the sharing of tacit knowledge, not considering other forms of knowledge. As a case study, although with heterogeneous organizations, the same cannot be replicated to different realities.*

**Keywords:** *Availability, Intent, Non-Profit Organizations, Organizational Learning, Tacit Knowledge*

### 1. INTRODUCTION

Knowledge is a resource that can and should be managed with a view to organizational learning and the improvement of its performance in the pursuit of the accomplishment of its missions. However, the sharing of tacit knowledge, notwithstanding the recognition of the benefits that may result, is not something that is easy to establish as a regular practice. Due to their unique characteristics, non-profit organizations (NPOs), where Portuguese Voluntary Firefighters (FBs) are incorporated, increasingly have the need to incorporate this knowledge sharing. There are scarce studies on the availability and intention of joint efforts in favour of implementing measures to this sharing of tacit knowledge, which in turn would promote organizational learning. Thus, the present article presents the results of a research on tacit knowledge sharing in Portuguese FBs, assessing the prevalence of the intention and availability of their commanders to this sharing and analysing whether this intensity and availability matches the treatment given to the knowledge obtained by past learning, coming from marked operational events. It should be noted that in Portugal there is no other type of organization where its driving force is composed of a combination of purely voluntary elements and employees that provide

the minimum daily operational services, with the volunteers assuring the night service and week, where there is an increase in the intervention and availability of these elements in the summer season, with a clear decrease in service in the remaining seasons, where the hierarchical structure follows a paramilitary regime, but which may include at the top of its pyramid firefighters who only perform functions under a pure voluntary system and operate in a service area as sensitive as civil protection. In an organization with these characteristics, the sharing of tacit knowledge is of paramount importance as a form of organizational learning for excellence. The article begins with a brief summary of the essential information about the objectives, the methodological approach, the main conclusions, the limitations of the research, and the originality or value of the research. The following is a brief introduction to the theme and keywords. The theoretical framework, with emphasis on tacit knowledge sharing and organizational learning, is presented below. The next point deals with the presentation and discussion of the results. Finally, we present the conclusions and recommendations for future studies.

## **2. THEORETICAL FRAMEWORK**

Tacit knowledge refers to a type of knowledge whose description or communication is not an easy task. According to Dalkir (2005), Haldin-Herrgard (2000), Kikoski and Kikoski (2004), McAdam et al. (2007) and Pavlicek (2009), it is possible to gather a set of identifying properties about what is tacit knowledge. For these authors, it is a type of knowledge that resides in human minds and in relationships between individuals in an unstructured form, difficult to see, codify, estimate, formalize, investigate, describe, capture or communicate with precision, being acquired through the sharing of experiences, observation, imitation or by "face to face" interaction. It is, therefore, a knowledge rooted in action, in procedures, in commitments, in values and in emotions. For these authors, tacit knowledge empowers the individual to better deal with exceptional and unexpected situations. For Stanton and Stammers (1990), the main characteristic of tacit knowledge is the belief that their nature is personal. For Sternberg and Horvath (1999), tacit knowledge has a practical utility because it is predominantly about how to do things. For Polanyi (1966) and McInerney (2002), tacit knowledge is subconscious, personal, difficult to articulate, perceived, unconscious, based on experience, shared through conversation, and imbued with stories. It is also based on insights and understandings, judgments, assumptions, relationships, norms and values, and organizational culture. Davenport and Prusak (1998) describe some of the characteristics of tacit knowledge that make their sharing a challenge. For these authors, tacit knowledge is difficult to code in documents or databases; is developed and internalized over a long period of time and within a specific cultural environment; this tacit knowledge-taking process is not always a conscious process; and some of this tacit knowledge may not even be capable of representation outside the human mind. Since the present study focuses its attention on the contributions of this type of knowledge to organizational learning, it is important to understand how this occurs. For Akgun et al (2003) and Chan (2003), there is clear evidence that learning occurs in organizations during dynamic interactions between individuals, groups and the organization itself. According to Senge (1990), in an organization, the learning process can occur at three levels: individual, group and organizational. For this author, it is precisely at the organizational level that the process of individual learning, of understanding and interpretation shared by the group, is institutionalized and revealed in various forms, such as organizational structure, rules, procedures or symbolic elements. For Drejer (2000), this organizational learning is recognized when it is perceived that it is responsible for equipping the organization with greater competences. According to Kim (1993), organizational learning is more complex and dynamic than individual learning, given the increase in the number of participants, complexity increases. For the same author, organizational learning is therefore the result not only of individual learning, but also of the

dynamics established between individuals in organizations. Thus, according to Davenport and Prusak (1998), knowledge, in general, moves in organizations, being applied to the service of the organization whenever it is justified. However, we have already seen that tacit knowledge is especially difficult to share, so Nonaka and Takeuchi (1995) refer to socialization as the process of excellence for sharing tacit knowledge among individuals and based on a process of sharing experiences that is often done through observation, imitation, and practice, and often occurs in the aftermath of the development of informal relationships among organizational elements.

### 3. DATA COLLECTION AND METHODOLOGY

In pursuit of the objectives, case studies of this type of NPOs in Portugal, the FBs, were carried out, without the pretension of generalization or extrapolation, since tacit knowledge is intrinsically related to the environment in which it is developed. It was decided to carry out a qualitative research, for which a set of semi-structured interviews was carried out, with a pre-approved script, but with sufficient openness to alter the order of the questions, applied to FB's commanders of the central region of Portugal. The interview questions dealt with the demographic data of the interviewees and their experience, a set of questions to ascertain the intensity and availability of tacit knowledge sharing and another set of questions to identify the treatment given to the knowledge obtained in past learning. The technique used to select the sample was the snowball technique, with the 8 interviews (Commanders of the volunteer firefighters of Brasfemes, Oliveira do Hospital, Anadia, Góis, Loriga, Penela, Guarda and Miranda do Corvo) carried out between the July 12 and August 24, 2018.

### 4. PRESENTATION AND DISCUSSION OF RESULTS

The presentation and discussion of results is divided into two parts. Part I concerns data on the intensity and availability of tacit knowledge sharing within FBs, while Part II deals with data on treatment of past learning within these institutions.

#### 4.1. Part I - Intent and availability of tacit knowledge sharing

Table 1. condenses the answers obtained from the commanders of FB's who were interviewed as part of this study, regarding the intention and willingness to make efforts to lead the organization to greater sharing of tacit knowledge. In this regard, it is important to mention the contribution of Rêgo et al. (2012), which tells us that when a person is approached to share what he knows, he is asked to invest his time and dedication, usually without any reward or recognition, which has already been confirmed that is what happens in the present study. Therefore, it is important to assess whether there is in the organization under study the intensity and availability necessary for a reinforcement of this process of tacit knowledge sharing.

	Brasfemes		Oliveira Hospital		Anadia		Góis		Loriga		Penela		Guarda		Miranda Corvo	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Intention and availability	X			X	X		X		X		X			X		X

Table 1: Intention and availability for increased sharing of tacit knowledge in FB's

Source: Authors' own elaboration

Thus, with respect to the indicators under study, it is possible to verify that most of the interviewees acknowledge their intention and willingness to share tacit knowledge, with only E2 (OLIVEIRA DO HOSPITAL), E7 (GUARDA) and E8 (MIRANDA DO CORVO) show that they do not have this intention and availability.

The reasons that these interviewees point out focus on the privilege they give to the relationship with the elements of the hierarchical superior positions, such as the elements of the command and control, the fear of overcoming the competences that belong to the intermediate staff of the organization, the fear of excessive internal competition, both between those who learn and between those who teach and the fact that similar experiences have existed that have been unsuccessful. Thus, according to E2 (OLIVEIRA DO HOSPITAL):

- I have my Staff who are my two fellow command helpers. (...) The trick and the tip to work with the volunteers, but only to keep them motivated, and here the trick is very simple: always walk on top of them. "E2 (OLIVEIRA DO HOSPITAL)

E8 (MIRANDA DO CORVO) emphasizes past experiences without success and shows fear in the excessive internal competitiveness that tutoring processes or more individualized monitoring could promote, and highlights that there are aspects of their activity as a commander that should not pass to the knowledge of the hierarchical inferiors:

- "No. (...) We have here something that is not working and that are the tutors. All trainees have a probative part they have to have a tutor and this no one is complying with this part because it does not make sense. There are things we know, which are for us and which should not pass down a certain hierarchical position. There are small things that we must keep ours, because otherwise the commander did not exist."

However, the majority of respondents acknowledges having availability and intent to share tacit knowledge, and in this regard, we highlight the contributions of E4 (GÓIS) and E6 (Penela), which present their arguments and give examples:

- "Yes. I would like to be able to serve as a tutor to most of my firefighters and then put them to practice what they could learn from me. Every day, if I come and see something that they are not doing or if they see something, they can do to improve it, it's something I do, a job of correcting, up to compliment if that's the case. I think this is my role, that of improving day by day here of the boys. E4 (GÓIS)
- "We are living, we are acquiring a set of knowledge and for me this is very important. The question of being able to share these things ends up being a bit of vanity that ends up having." E6 (PENELA)

Regarding the indicators under analysis, it is important to highlight the testimony of E5 (LORIGA), which states that the future of its FB is based on this sharing of knowledge between itself and its members, and is the main driver of knowledge that is made within this organization:

- "Yes. This is mandatory in a house of these because otherwise we have no future. I have a 3rd class firefighter here who works directly with me in my office. Because I'm not here every day, I've volunteered for 25 years and if there's no one in here who can really understand how it's done, I take everything behind me, and this has no logic at all." E5 (LORIGA)

E5 (LORIGA) further states its readiness to cooperate with any subject of your organization in order to contribute to the optimization of the daily tasks of these:

- "All. There is one thing that normally is up to me, which is the question of budgets, and I would like to point out that this girl (3rd class firefighter who supports the Commander), as my deputy and second commander, are also present to tell your opinion and in general we talked". E5 (LORIGA)

#### 4.2. Part II - Past learning

Past learning is considered a process that allows an organization to learn from its mistakes and successes, preventing mistakes from being repeated in the future, but successes are. For Dressler (2007), the lack of involvement and commitment on the part of the leadership with a process of learning in this way is the most critical barrier that can be found. However, if the focus of this analysis is to point the finger at the guilty of something that went less well, quickly loses focus of learning and the process exits frustrated because the essential must not judge what happened but learn and grow from the collective experience. It is important to understand how the target FBs of the present study relate to past learning and to what extent they produce effects and relate to tacit knowledge sharing.

Past learning	Brasfemes		Oliveira Hospital		Anadia		Góis		Loriga		Penela		Guarda		Miranda Corvo	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Further analysis to a striking event.	X			X		X		X		X	X			X		X
Sharing of conclusions resulting from the analysis of a striking event.	X			X	X			X		X	X			X		X
Alterations to operational performance by striking event analysis.	X			X	X			X	X		X			X	X	
Embedded learning in instructional context.		X		X	X			X	X		X			X	X	
Learning communicated to the ANPC command structure.		X		X		X		X		X		X		X		X
Learning communicated to another FB's.		X		X		X		X		X		X		X		X

Table 2. Incorporation of past learning in tacit knowledge sharing in FB's

Source: Authors' own elaboration

The first question seeks to understand whether there is a subsequent analysis of a major operational event within the organization under study. By analysing the respondents' answers, it is possible to verify that this analysis is not done and that only a minority of the respondents, E1 (BRASFEMES) and E6 (PENELA) pronounce themselves in the sense that in their organizations, this analysis is performed. Among them, it is important to mention the contribution of E1 (BRASFEMES):

- “At each occurrence, we make a briefing of this occurrence. Things that went well, things that went less well. ... we pass this analysis to the personnel, we have immense occurrences in the day to day and for this purpose, we only value those that escape our routine.” E1 (BRASFEMES)

However, most interviewees acknowledge that this is not the case in their FBs. The main reason pointed out is the lack of time that the volunteers present to be present in these moments of analysis, being that we highlight the testimony of E7 (GUARDA):

- “We try and the right word is we try because we are based on volunteering, but ideally after an event we spend a little of our time analysing the events, but I recognize that it is not always possible. Time is running out, because firefighters have to pick up the wife, the son, and it becomes difficult for that to happen.” E7 (GUARDA)

The second question aims to determine if there is a sharing of conclusions with all elements of the FB's active body, resulting from the analysis of a striking event. Following the collected testimonies, it is possible to verify that the majority of the FBs do not share the conclusions of this analysis, being that 3 interviewees indicate that this is their practice. As an example, we highlight the testimony of E3 (ANADIA):

- “Normally it is decided at the moment of the briefing, if the subject is consensual, changes to procedures and way of acting and communicate to the rest of the fire department. E3 (ANADIA)

Despite these cases, most interviewees report that there is no such sharing of conclusions so that they reach all the elements of the active body. It is possible to see that when there are these efforts to share conclusions, they only reach the elements involved in operations on the ground and not the organization as a whole, or at least the active body, or it is done late, when the focus attention is no longer desirable. As an example, we highlight the testimonies of E7 (GUARDA) and E8 (MIRANDA DO CORVO):

- “Sometimes this is done in a more solitary way than it should be, it should be a team and if possible, at the right time, because everything is very fresh in the memory, but since sometimes we do not have that possibility, we do it posteriori and some information has already been lost.” E7 (GUARDA)
- “Yes, we come to some conclusions, but are only shared by those who have been there. There is no general document that helps to pass the information to the other firefighters all.” E8 (MIRANDA DO CORVO)

The third question seeks to determine whether there are operational changes following the analysis of significant operational events. Following the collected testimonies, it is possible to verify that the majority of the FB's adopt attitudes, procedures and operational behaviours following the analysis of striking events. A minority of three respondents said they did not do so, arguing that it is something that they intend to implement or pay more attention in the future, such as E4 (GÓIS):

- “These changes will eventually take place when the rest is fully implemented.” E4 (GÓIS)

However, most of the interviewees refer to adopting changes in their operational performance following major operational events. As an example, we highlight the testimony of E1 (BRASFEMES) and E8 (MIRANDA DO CORVO):

- “Of course. Especially in the mistakes that deserve more our attention and concern for a correction of these errors. We are responsible for the various areas of action, such as forest fires, urban fires, rescue, among others and if those responsible say that things must change to work better this is incorporated and passed on to the organization.” E1 (BRASFEMES)
- “Yes, even at the level of the equipment and the material in the car, that instead of staying where it was, it happens to be in the place where it was seen that it would be better. In this case, it must be said in the following formations that the material has changed place.” E8 (MIRANDA DO CORVO)

The fourth question seeks to determine if the learning referred to in the previous questions, resulting from marked operational events, is incorporated and trained in the context of instruction or other specific training moments for the task. Following the collected testimonies, it is possible to determine that there is a balance in the answers of respondents, since half of these states that apply this learning in instructional context and the other half says otherwise. Among the negative responses, we can find arguments such as the lack of time for these tasks and the fear of innovating or adopting new positions in sensitive matters such as the provision of relief. It is important to highlight the contribution of E7 (GUARDA):

- “No, it is the first time we do a simulation of uncaring trying to approach the circumstances of an accident where we had difficulty. We've tried to do that, but it's never been the same. We do not do it the best way because time is the enemy of these things and being volunteers, sometimes we have these difficulties.” E7 (GUARDA)

On the contrary, among the testimonies that point to the adoption and training of these learning in context of instruction or training specific to the task, we must refer to the following testimonies of E3 (ANADIA) and E5 (LORIGA):

- “When changes can be trained in instructional context, yes. There are small procedures that do not apply to the instruction context.” E3 (ANADIA)
- “Sometimes they are, sometimes they are just attention calls that have to be made.” E5 (LORIGA)

The fifth question seeks to determine if the lessons learned in the previous questions arising from the analysis of significant operational events are communicated to the command structure of the National Civil Protection Association (ANPC) or to other national bodies that relate to the FBs and to those who these lessons can also be useful. Following the testimonies collected, it is possible to verify that no interviewee acknowledges this. All the testimonies collected point in the opposite direction, in the sense that this sharing of learning is never done. Among the reasons for this, we can point out that there is no hierarchically superior body to the commander of each FB, that in some way can promote the sharing of knowledge and learning in an operational context, of internal issues and therefore of should not be shared or, if they are mentioned with other entities, they are mere coincidences, in fortuitous meetings between people who occupy positions in these institutions, and in this case we cannot consider this a formal communication. It is important to note the testimonies of E3 (ANADIA), E4 (GÓIS) and E8 (MIRANDA DO CORVO):

- “The hierarchical structure of the firemen ends at the commander and there is a very large void because above four hundred and such, there is nothing and no one.” E3 (ANADIA)
- “There is no care of sharing with the ANPC or other FBs, and there may be informal conversation, after being in an informal environment, it is nothing official or formal.” E4 (GÓIS)
- “No. It's all internal.” E8 (MIRANDA DO CORVO)

The last question seeks to ascertain if the learning referred to in the previous questions coming from the analysis of important operational events, if they are communicated to another FB's. Following the testimonies collected, it is possible to verify that no interviewee acknowledges this. All the testimonies collected point in the opposite direction, in the sense that this sharing of learning is never done. Among the reasons for this we can point out the fear that this attitude of proactivity could be seen by other FB as an arrogant attitude to demonstrate that if it is better or that one knows more and that one wants to teach others to do their work, the fact that it is not habit or practice for some commanders to know the organizational reality of FBs other than

those where they actually perform functions or, once again, to deal with internal issues that only concern the FB in question. It is also mentioned that there is no hierarchically superior body to the commanders that promote these moments of sharing of learning and eventually there happens talks between commanders, they take place in a spirit of informality, without any intentionality or regularity. It is important to mention the E1 (BRASFEMES) and E2 (OLIVEIRA DO HOSPITAL):

- “This is a very delicate and touchy case. For many reasons. We understand that each fire department has its own command and I am telling others how things are to be done was to meddle in the work of others, which is not within my competence, and therefore it is best to stand by here in our backyard. If you ask us for information, we will give it to you, of course, but having the vehemence of the initiative to do so is putting the car in front of the oxen. Who could promote this would be the District Federation to which we belong or the ANPC, but it does not happen.” E1 (BRASFEMES)
- “No. These are internal issues ... what has been learned and changed is our own.” E2 (OLIVEIRA DO HOSPITAL)

## 5. CONCLUSIONS AND RECOMMENDATIONS

It is possible to conclude that the commanders of the FBs, as the maximum responsible for the hierarchical structure of the organization to which they belong, tend to demonstrate intention and availability for the sharing of tacit knowledge. However, this intention and availability does not find a practical sequence, since according to past learning, in particular, what happens to the knowledge that may result from past learning following major operational events, it is possible to realize that it is rarely done any kind of analysis or shared their conclusions of that analysis within the FB itself, only on an ad hoc basis are operational changes incorporated or incorporated in the context of instruction, and there is never a case of sharing this knowledge with the national civil protection structure or other FBs. In short, despite the intention and willingness of the FB's commanders to share tacit knowledge in order to increase organizational learning, there is a clear need to change their attitude towards the new knowledge acquired in past learning, as a result of significant operational events. Finally, it is recommended to carry out other studies that analyse the sharing of tacit knowledge in other NPOs, such as cooperatives, mercy, private social solidarity institutions, mutual associations, foundations, among others increasingly important in the Portuguese society.

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## INFLUENCE OF SELECTED FACTORS ON USING INVESTMENT GRANTS IN BUDGETS OF SMALL MUNICIPALITIES OF SOUTH BOHEMIAN REGION

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### ABSTRACT

*While forming a comprehensive theoretical interpretation of regional development, the issue of economic base as a system, which consists not only of economic entities, but also other elements affecting economic performance, comes to the forefront. On the condition that territorial budget revenues are evenly distributed, public goods are provided to municipalities and regions approximately in the same structure, quality and quantity. This is important for planning volumes of municipal needs, particularly investment needs, in the local and regional public sector. The paper aims to determine factors that influence drawing down of investment grants by small municipalities of the South Bohemian Region between 2013 and 2017, with the municipalities being classified into the authors' established size category of 500 – 4999 inhabitants. In order to assess grant drawdown, a specific ratio indicator of covering capital expenditures by investment transfers was selected, and the following factors and their effects were looked into: size of municipalities (given by population), their distance from the regional city of České Budějovice (Budweis) and their accessibility (peripheral municipalities), municipalities with historical character. To examine dependence, descriptive statistics was used, normality of data was assessed, and given the results obtained, non-parametric conformity-based tests were used as well. Based on the analysis conducted, the authors conclude that at a 5% significance level, dependence of the ratio indicator on the above factors was not proved in the specified category of municipalities. To identify other factors likely to influence the level of drawing down of investment grants by small municipalities, it will be necessary to carry out field research directly in selected municipalities.*

**Keywords:** *Investment grants, Regional development, Small municipalities, Territorial budget*

### 1. INTRODUCTION

If one is to give a theoretical overview of particular regions and their development, it is advisable to point out importance of economic base as a system comprising certain economic entities and additional elements that affect economic performance. Given high fragmentation of the Czech Republic's settlement structure, studying factors that influence functioning of municipalities is an important topic a number of experts have been concerned with. Provided there is a fair distribution of territorial budget revenues, municipalities and regions are supplied with public goods at similar levels of quality, quantity and structure.

In terms of the local and regional sector, this is significant in view of considering certain volumes of municipal needs (primarily investment needs). Although own revenues should account for the main source of municipalities, various types of grants are also a very important part of local units' economy. In many cases, they allow for implementation of investment projects that municipalities themselves could not afford, and therefore represent a significant proportion of municipal revenues. Additionally, this paper is part of the authors' research that focuses on analysing grant possibilities of small municipalities of the South Bohemian Region given their specificities in comparison with large cities in the Czech Republic and Europe. An important criterion in selecting the region was the location of the author's workplace, their good knowledge of the region's surroundings and the resulting presumption of better assessment of the informational value of obtained information. The paper presents classification and quantification results of factors that influence the amount of drawing down grants between 2013 and 2017, where the following factors were determined: size of municipalities (given by population), their distance from the regional city of České Budějovice (Budweis) and their accessibility (peripheral locations), municipalities with historical character.

## **2. THEORETICAL OVERVIEW**

### **2.1. Size of municipalities**

The paper follows from previously published contribution (Popílková, Raušer 2018) having defined the term "small municipality" and its size category. Due to the settlement system of the South Bohemian Region and also due to a possible comparison within the European Union, a small municipality has been designated as a unit with 500 – 4 999 inhabitants and thus will be viewed accordingly. At present, differences between the urban and the village character of municipalities are diminishing (see, for example, Hampl and Marada 2015, Novotný et al. 2016), hence these characters shall not be distinguished. The size of municipalities and their geographical location as well as specific factors of their development are generally considered as the main characteristics of municipalities and their respective position. According to Hampl and Marada (2015), the existence of a large number of small municipalities eventually leads to certain fragmentation of financial resources and as a result, this creates significant gaps between poor and wealthy municipalities. It is therefore necessary to consider the size of municipalities as one of the factors influencing their financial position.

### **2.2. Geographical position of municipalities**

According to Perlín et al. (2010), geographical position as an indicator of relative position in connection with superior regional centres is a factor to be taken into account as well when assessing differences in the development of individual municipalities. Geographical position should also be reflected in some economic indicators, and as Chromý and Skála (2010) point out, it is the key factor in the existence of peripheral areas (particularly its role in a settlement hierarchy and in the West-East direction). In recent years, Bernard and Šimon (2017) have been concerned with this issue in the Czech Republic assuming the existence of several types of peripheral areas. From the geographical point of view, the first peripheral area in the Czech Republic involves municipalities located in borders of regions, i.e. those being a great distance from regional cities as the natural centres of the regions. The second peripheral area encompasses municipalities with their position near the national borders of the Czech Republic. Within the South Bohemian Region, a detailed classification of peripheral areas was made by Kubeš and Kraft (2011). Based on positions relative to the national borders and borders of regions, they recognized three types of peripheral areas – border areas, inter-regional areas and intra-regional areas, having eventually identified 7 border areas, 6 intra-regional areas and 9 intra-regional peripheral areas of the South Bohemian Region. It should be noted that their research has become the basis for the division of municipalities assessed in this paper (i.e. into

peripheral municipalities and others). Furthermore, the topic of peripheral municipalities and their position has also been addressed by other authors within Europe. For instance, border areas of Serbia have been discussed by Anđelković-Stoilković et al (2018) claiming that geographical distances and isolations of transport cause significant social and economic problems in a number of municipalities. They also observe that peripheral areas are not attractive for investments (resulting in social exclusions and high unemployment rates) and their level of economic development is generally lower than the national average. In Slovakia, Vaishar and Šťastná (2016) state that due to a lack of own financial resources, peripheral municipalities have been forced to seek external investments. However, their providing is dependent on particular benefits of the areas to be invested in. The other possibility is seen by them in public grants, though more developed regions have a greater chance of receiving them. Owing to higher financial resources, such grants may be provided by firms/companies that are able to develop and promote various projects.

### **2.3. Assessment of financial position of municipalities – research of professional sources**

As an area of research interest, financial position of municipalities has been viewed in the Czech Republic and abroad. A detailed analysis of research approaches shows that the topic is most frequently assessed using selected ratio indicators. In Slovenia, Devjak et al. (2009) focused on a thorough analysis of financial indicators according to various perspectives. The indicators of financial situation of municipalities are divided into analytical indicators and synthetic indicators. Regarding the latter, the authors cover the indicators of financial independence, activity, economic efficiency and management of budgetary expenditures and revenues. In terms of analysing the revenues, they use percentages of each type of revenues in relation to total revenues. Certain development and measurement of financial autonomy of municipalities in Slovakia have been examined by Žárská (2009), Flaška et al. (2017) and Kološta et al. (2013). Žárská (2009) has been dealing with analyses of financial capacity and financial viability of small municipalities in Slovakia with the use of the following indicators: financial strength (local taxes + share taxes + grants/number of inhabitants), rates of self-sufficiency (own revenues/total revenues or own revenues + grants/total revenues); rates of self-financing (own revenues/own expenditures). Assessing financial stability of municipalities has been an area of concern of several Polish authors as well. Olejniczak (2017) has been exploring an impact of compensatory transfers within budgets on revenues of rural municipalities in Poland. To assess the financial situation of municipalities, he uses budgetary indicators cleared by the influence of reallocated revenues (the so-called general grants in Poland) – the shares of own revenues in relation to total revenues, current revenues in relation to total expenditures, operating surplus in relation to total revenues, rates of self-financing. General grants and their influence on the financial situation of rural municipalities in Poland have been addressed by Kandula (2017) using the indicator of tax revenues per capita to assess differences between municipalities. Szczepaniak (2016) has been engaged in the influence of EU funds on financial autonomy of Krakow. Among other things, the autonomy of investment expenditures is being assessed here by means of the indicator of autonomy of expenditures (the ratio of sources of financing in relation to expenditures), while Krakow's financial situation is reviewed according to the indicator of financial self-sufficiency of the municipality and its rate of self-financing. Banaszewska (2018) examines determinants of local investment expenditures in Polish municipalities falling under the size categories of up to 5000, 10000 and 20,000 inhabitants. According to the author, investment expenditures increase only in connection with the increase of own revenues and provided grants. Other results show that the investment policy of Polish municipalities is also affected by economies of scale, preferences of local communities and infrastructure. Possibilities of developing fiscal decentralization and a significant part of local finances of municipalities in Lithuania (together with analysing structures of Lithuanian

municipal budgets from the viewpoint of tax decentralization) have been pursued by Slavinskaite et al. (2015). In order to assess municipalities and their financial situation, they only apply percentages of individual types of revenues within municipal budgets and state that a high level of transfers from the state budget (income taxes, grants) accounts for relatively lower financial independence of municipalities, since these transfers are linked to specific obligations. Davulis (2007) evaluates both the degree of fiscal decentralization and the independence of local municipalities in Lithuania only on the basis of ratios of individual types of revenues in relation to total municipal revenues. Breaking down financial health of municipalities in the cross-border comparison can be found in the work of Padovani et al. (2018). In their research, they established 10 sample financial ratio indicators (calculated from municipal accounting records) and demonstrated their application on exemplary cities (Barcelona, Dublin, Detroit) having used the financial autonomy indicator (the ratio of own revenues in relation to total revenues) in their assessment of the cities' financial independence. Zafra-Gómez et al. (2009) evaluate power of financial performance indicators on a sample of 699 Spanish municipalities with over 1,000 inhabitants between the years 2002 and 2005. They use indices of financial independence, common financial independence, tax revenues, own revenues (own revenues divided by total revenues). In the Czech Republic, Pavlas (2015) focuses on determining an aggregate indicator of financial stability of municipalities. Partial indicators used in his calculations include, e.g. self-financing capacity, capital budget balance and covering capital expenditures by investment transfers. Plaček et al. (2016) assess the size of municipalities as well as pre-election periods and their influences on the indicators of investment expenditures per capita, total expenditures per capita and expenditures on transfers per capita. Certain effects of grants on capital expenditures and political budget cycles within municipalities on capital expenditures have been discussed by Sedmíhradská et al. (2011) who observe significant increases in capital expenditures and considerable reductions of current expenditures prior to municipal elections. Financial analyses and assessment of financial stability of municipalities have also been addressed by Opluštilová (2012). According to Jáčová and Syrovátková (2009), who conducted a questionnaire survey among municipal representatives in the Czech Republic, municipalities lack financial resources not only to carry out their regular activities, but also to cover their investment activities. One of the ways to obtain sufficient funding resides in additional funding from public budget grants at the central or regional level as well as from foreign grants (particularly from EU funds).

### 3. METHODS

Given the extent of possible indicators and their determinants, the authors first focused on data available from public databases and statistical research. They selected indicators that belong to a group of indicators recognizing financial situations of municipalities merely on the basis of accounting data. Therefore, the results are limited by the availability of such data (Zafra-Gomez et al. 2009, Cohen a kol., 2012, Padovani 2018). A detailed analysis of approaches shows that financial positions of municipalities are most frequently assessed using particular ratio indicators. In order to assess the use of grants in this paper, the authors only applied covering capital expenditure by investment transfers as an appropriate ratio indicator. It expresses how successful municipalities are in obtaining transfers to cover their capital expenditures, and its results are given by the abilities of municipalities to choose their investment activities even in relation to announcements of grant opportunities (and their abilities to apply for grants). Selecting the indicator was also conditioned by the authors' focus on finding reasons for drawing down grants by the municipalities examined. It should also be noted that the indicator shall be calculated as a percentage (in particular years under review) and referred to as CEIT (i.e. capital expenditures by investment transfers). In order to commence calculations for own research purposes, a database application termed as MONITOR was used as the main data

source. According to Půček (2015), it is a specialized information portal of the Ministry of Finance of the Czech Republic intended for the general public and other interested parties. The database contains budgetary and accounting information from all levels of self-government since the year 2013 and is updated every three months. Regarding the examined municipalities, accounting data for the period under review (2013-2017) were therefore collected from the Monitor database and CEIT13 – CEIT17 ratio indicators were calculated for individual municipalities. The resulting figures may be distorted within the given financial statements if transfers to the current investments were provided in previous years, and if the provided transfers were drawn down in several calendar years. It is advisable to assess this indicator in the longer term, whether for a specific municipality or its comparison with municipalities with similar parameters. Here, data obtained from municipal accounts over the monitored period are adjusted so that the multi-year investment transfers may be divided into individual years according to the actual drawdown. To examine dependence of investment transfers on capital expenditures in 2013 – 2017 (i.e. CEIT13 – CEIT17), the following statistical methods will be used: descriptive statistics (frequency distribution tables, basic numerical characteristics, histograms and boxplots, conditional distributions and their graphs and numerical characteristics), computational and graphical methods of normality testing (Kolmogorov-Smirnov test and Shapiro-Wilk test) and non-parametric tests (Mann-Whitney U test and Kruskal-Wallis test, Stuchlý 2015). In addition, MS Excel, R system and IBM SPSS Statistics will be used to perform data analysis (Řehák, Brom 2015). The authors will observe how percentages of investment transfers of municipalities of the South Bohemian Region (meritorious variables of CEIT) were affected by the previously mentioned factors (identification variables): size, distance from the regional city, accessibility (peripheral municipalities), municipalities with historical character. There will be a specific analysis of dependence on size, whereas analyses of the other factors shall be performed briefly.

#### 4. RESULTS

As may be seen in Table 1 below, CEIT increased in 2014 (CEIT14), eventually reached its maximum in 2015 (44.4%) and then dropped to its minimum in 2017 (25.3%). Data variability was fairly stable between 2013 and 2016, yet declined in 2017 (standard deviation  $s = 27,49$  %). Frequency distribution at this level was asymmetric and rather flatter than the normal distribution.

*Table 1: Basic descriptive statistics of meritorious variables of CEIT (in %) between 2013 – 2017(authors' own processing)*

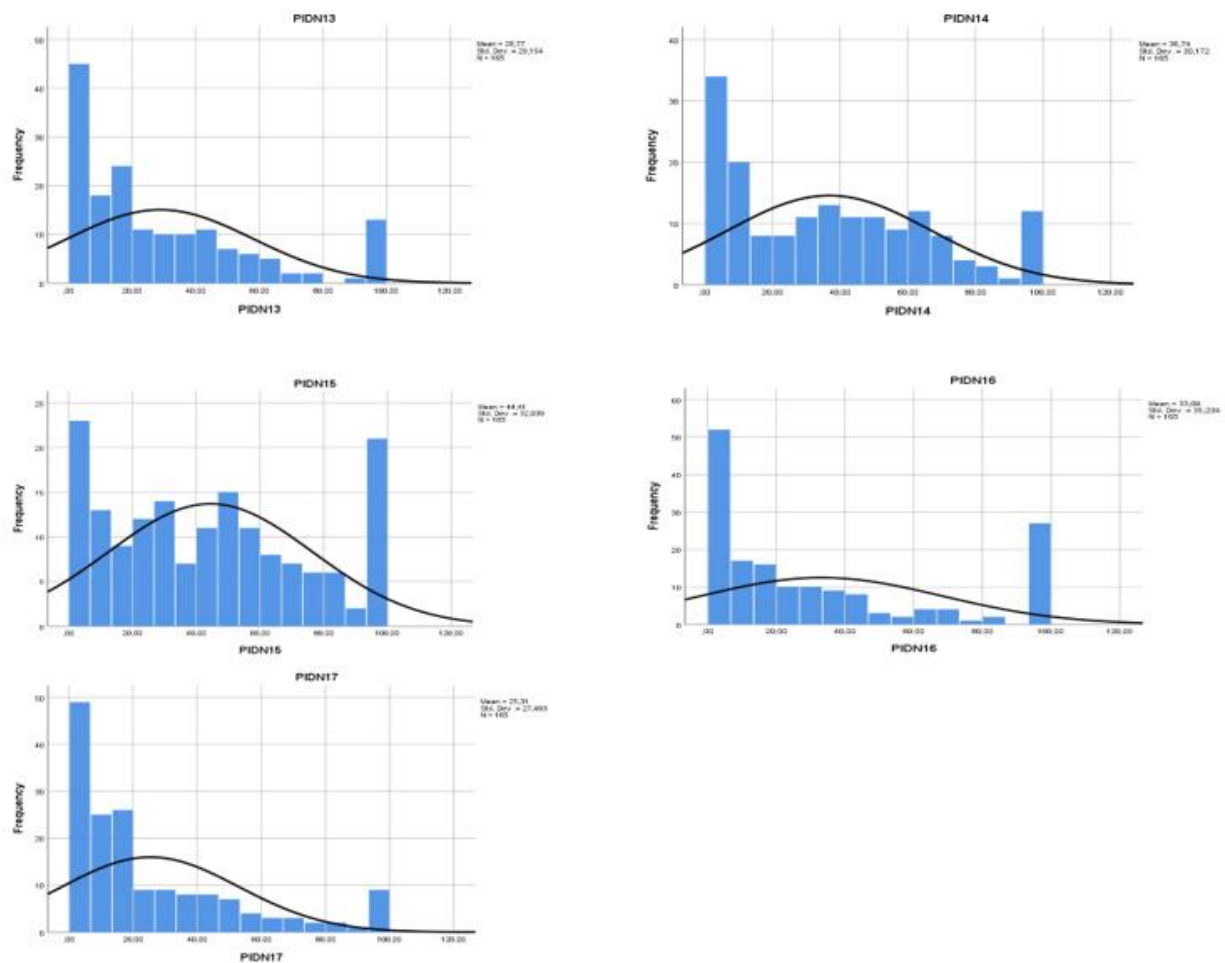
Descriptive Statistics							
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
CEIT13	165	0,00	100,00	28,7676	29,15401	1,169	0,541
CEIT14	165	0,00	100,00	36,7372	30,17246	0,532	-,707
CEIT15	165	0,00	100,00	44,4080	32,03885	0,321	-1,016
CEIT16	165	0,00	100,00	33,0893	35,23415	0,947	-,543
CEIT17	165	0,00	100,00	25,3069	27,49273	1,364	1,072

In order to find out normal distribution, Kolmogorov – Smirnov test as well as Shapiro – Wilk test showed that (at a 5% significance level) all meritorious variables used (CEIT13 - CEIT17, see Table 2) do not have normal distribution.

*Table 2: Normality tests of individual meritorious variables of CEIT between 2013 – 2017  
 (authors' own processing)*

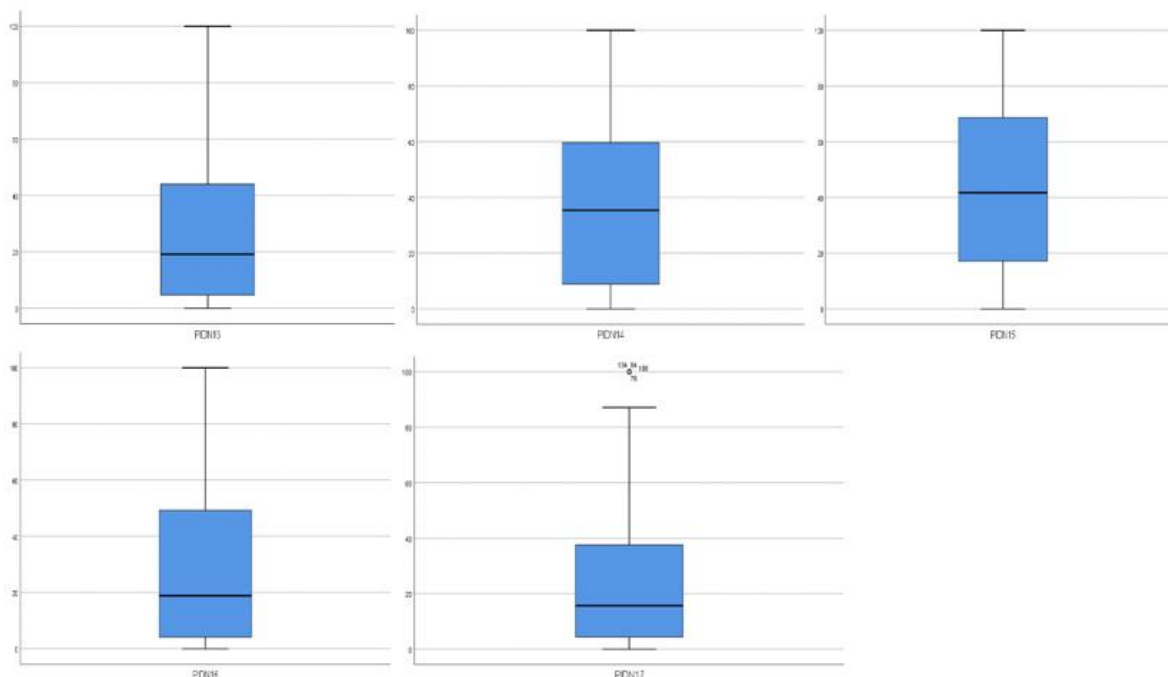
Normality Tests						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
CEIT13	0,162	165	0,000	0,848	165	0,000
CEIT14	0,112	165	0,000	0,921	165	0,000
CEIT15	0,083	165	0,008	0,933	165	0,000
CEIT16	0,174	165	0,000	0,809	165	0,000
CEIT17	0,190	165	0,000	0,821	165	0,000

Moreover, the following graphs in Chart 1 illustrate significant differences between empirical and theoretical distributions for all meritorious variables.



*Chart 1: Graphical verification of normality of meritorious variables by histogram of their empirical distributions and plotted curves of corresponding normal distribution (authors' own processing)*

Regarding Chart 2 below, meritorious variables do not have normal distribution. The graphs confirm differences in results of the basic characteristics of level, variability and shape distributions from Table 1. CEIT15 has the highest level (median = 41,7 %), whereas CEIT17 has the lowest level (median = 16,0 %). CEIT16 has the highest variability (s = 35,2 %) – there is a great variability of the variable (the mean is determined with a large error).



*Chart 2: Boxplot distributions of meritorious variables of CEIT (in %) between 2013 – 2017  
 (authors' own processing)*

In Table 3 below, it is possible to observe gradual percentage changes in the level and variability of investment transfers in relation to the size of municipalities (given by their population) in individual years. Large differences between arithmetic means and medians indicate significant asymmetry in the distribution of meritorious variables. Also, the figures from Table 3 were further assessed with the use of box diagrams, being at the authors' disposal, and clearly confirming the results stated in the previous paragraph. It may also be observed that a few size (population) values are outliers. Owing to the results of data normality testing, regression functions cannot be used to assess dependence, which was examined using Kruskal-Wallis test and Mann-Whitney U tests. The results are then shown in Table 4.

*Table following on the next page*



*Table 3: Conditional means and standard deviations by size (population) (authors' own processing)*

Population		CEIT13	CEIT14	CEIT15	CEIT16	CEIT17
[500; 1000)	N	86	86	86	86	86
	Mean	30,0505	36,4761	50,6528	31,9660	27,7224
	Median	19,3592	30,4033	50,0810	18,8855	16,5438
	Std. Deviation	30,88790	31,95585	33,94311	34,89251	29,41411
[1000;2000)	N	52	52	52	52	52
	Mean	27,1447	40,1404	41,2651	37,0204	26,9388
	Median	18,5324	40,8760	39,2064	20,6401	16,0807
	Std. Deviation	27,09931	28,53466	28,97428	36,89174	27,78582
[2000; 3000)	N	16	16	16	16	16
	Mean	32,6561	32,1798	30,8931	34,4719	18,2935
	Median	22,5528	24,4608	20,4854	20,1967	12,9300
	Std. Deviation	32,48237	31,81497	32,00254	36,46578	19,41697
[3000; 4000)	N	7	7	7	7	7
	Mean	18,7364	34,1426	35,0042	26,0962	7,5333
	Median	16,6129	37,0630	38,7837	14,2717	1,0058
	Std. Deviation	11,80332	23,98101	16,79420	35,19888	11,07676
[4000;4999)	N	3	3	3	3	3
	Mean	24,2862	20,8773	21,5187	12,8423	11,3159
	Median	11,9441	21,4415	20,3347	10,9436	7,8177
	Std. Deviation	30,96719	10,78807	18,60358	11,47194	8,76894
Total	N	164	164	164	164	164
	Mean	28,7676	36,7372	44,4080	33,0893	25,3069
	Median	19,1680	35,3818	41,6850	18,8470	15,6924
	Std. Deviation	29,15401	30,17246	32,03885	35,23415	27,49273

*Table 4: Tests of dependence of meritorious variables of CEIT on categorized variables of size (population), distance, accessibility, historical character (authors' own processing)*

Categorized Variable	Test	CEIT Sig. – Reject or retain the null Hypothesis					The null hypothesis
		2013	2014	2015	2016	2017	
Size (Population)	Kruskal-Wallis	0,980	0,645	0,072	0,686	0,198	The distribution of CEIT is the same across the category of Size (Population)
		Retain	Retain	Retain	Retain	Retain	
Distance	Kruskal-Wallis	0,907	0,831	0,398	0,663	0,855	The distribution of CEIT is the same across the category of Distance
		Retain	Retain	Retain	Retain	Retain	
Accessibility	Mann-Whitney U test	0,037	0,557	0,133	0,847	0,244	The distribution of CEIT is the same across the category of Accessibility
		<b>Reject</b>	Retain	Retain	Retain	Retain	
Historical Character	Mann-Whitney U test	0,191	0,520	0,440	0,738	0,666	The distribution of CEIT is the same across the category of Historical Character
		Retain	Retain	Retain	Retain	Retain	

Finally, being at a 5% significance level, CEIT13 - CEIT17 were not proved to depend significantly on size, distance from the regional city or historical character of municipalities. At the same significance level, CEIT14 – CEIT17 were not proved to depend significantly on accessibility, whereas CEIT13 was proved to depend significantly on accessibility.

The authors would also like to point out that their results are in agreement with results found by some other authors. For instance, in order to assess investment expenditures in Polish municipalities with up to 5000 inhabitants, Banaszewska (2018) selected aspects of percentage of elderly population, size of municipalities, the amount of own revenues, the amount of provided grants, preferences of local communities and infrastructure. She claims that capital expenditures are related to both the amount of own revenues and the amount of grants, yet they do not depend on the number of inhabitants or their age structure. However, preferences of local communities and infrastructure have an impact on investment expenditures. According to Holeček (2007), economic potential of Czech municipalities has been affected not only by their financial and asset base, but also the quality of municipal management whose activities and attitudes frequently determine their development and financial position.

## 5. CONSLUSION

The paper's main focus was to identify and assess particular factors that affect the ratio indicator of covering capital expenditures by investment transfers. A sample of 164 municipalities, located in the South Bohemian Region (the Czech Republic) and included in the size category of 500 - 4999 inhabitants, was assessed. Based on available data from the MONITOR accounting database, the authors calculated certain values of the indicator as ratios of investment transfers and capital expenditures for individual years of the period under review (2013 and 2017). Then, they determined factors they were able to quantify from available sources and assessed their impact on the given indicator, with the following factors having been eventually selected: size of municipalities specified by the number of inhabitants, distance of municipalities from the region's centre (i.e. the regional city of České Budějovice), their accessibility (peripheral municipalities) and municipalities with historical character. At the 5% significance level, dependence of the above indicator was not proved in relation to any of the factors (and data) obtained from available public sources. In order to gather information for classification and quantification of other factors, field research will be required with the use of questionnaire surveys and interviews with members of municipality management. Furthermore, the authors would then like to focus on researching the following factors – transaction costs of grants, managerial skills of municipal management, cooperation of municipalities on implementing investment activities, political and age structures of the population of municipalities and their management. The authors conclude that the findings (using grants to cover capital expenditures at a rate of 22-37%) correspond to the national trend, i.e. using own municipal revenues particularly for investment activities, which are not carried out if own revenues are insufficient. On using investment grants, there are significant differences between municipalities and the reference years, which are not related to selected quantitative indicators.

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## HOUSING LOANS RISK DRIVERS AND THEIR IMPACT ON BANKING AND RESIDENTIAL MARKET SUSTAINABILITY IN LATVIA

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### **ABSTRACT**

*Housing loans play an important role in improving living condition in developed countries. In Latvia, however, residential mortgage volumes have declined throughout the post-crisis year's and were at the end of 2018 12% below end 2008 level, while the house price index ca. 25% below pre-crisis level. The main reasons for this are banks credit losses, which resulted in a revision of credit granting standards and a deteriorating in their availability. On the other hand, households have experienced increased uncertainty, both as a result of financial difficulties, experienced during the crisis years and political instability in the post-crisis years. It is therefore essential to identify the true risk drivers and to analyse them. Based on existing researches in other countries, author has identified several dozen macro-economic indicators, such as the unemployment rate, wage growth, housing price index, etc. and micro factors such as the age of the borrower, total debt to income, loan-to-value, etc., have developed univariate and multivariate econometric models and have examined their statistical stability. Consequently, through consistent application, it is possible to take sound credit decisions, both in banks and by households, and to contribute to the sustainable development of the housing market.*

**Keywords:** *econometric models, housing loans, risk drivers*

### **1. INTRODUCTION**

In the last decade of the 20th century, and also in the first years of this century the housing loans market in Latvia was stagnant due to low household income level and high credit interest rates. Coming closer to join NATO and the EU, foreign investment flowed rapidly, the costs of bank resources declined and confidence in the long-term growth of household incomes strengthened. As a result, housing lending and the ratio of loans to GDP increased significantly, see Figure 1. Unfortunately, most of borrowers had no credit experience until then. Lack of understanding of the housing market, high inflation and overall euphoria lead to disproportionate against stable and regular income borrowing and disregarding of risks until mid-2007, when anti-inflation measures were approved by Latvian Cabinet of Ministers came into force. With the new framework loans granting fell sharply, followed with decrease in demand in housing market and much more difficult refinancing of existing commitments. In 2008 the impact of the global financial crisis on Latvia's financial market became critical, in the autumn the largest bank went bankrupt, GDP fell sharply and unemployment began to rise. As a result, the proportion of non-performing housing loans (HoNPL) increased rapidly - from 0,7% at the end of 2007 to 15,4% and 16.2% at the end of 2009 and 2010, respectively. Although HoNPLs have declined significantly starting from 2013 and have fallen below 2,5% at the end of 2018, the consequences are evident – at the end of last year housing loans volumes were 40% below pre-crisis level. As housing loans play a key role in improving household living conditions, it is important to be aware of the main risk drivers and to work to prevent the mistakes that have been experienced in the past.

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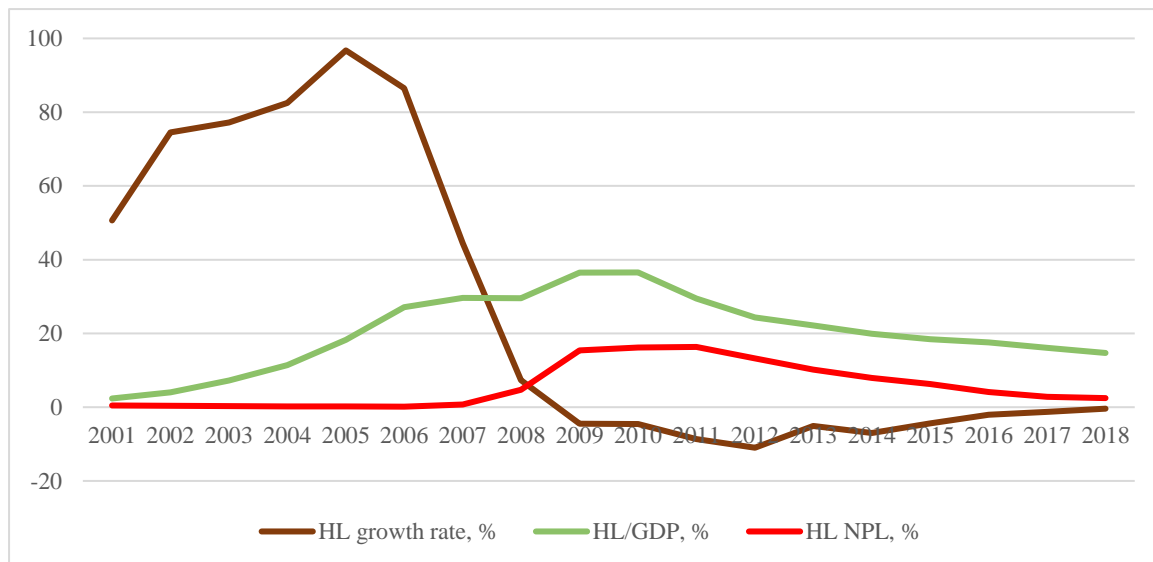


Figure 1: Housing loans growth rate, housing loans proportion to GDP and NPL development in Latvia (FCMC, CSB of Latvia data)

## 2. LITERATURE REVIEW

Studies on the housing loans delinquencies include wide variety of variables, which can be divided into three groups: borrower and transaction characteristics, and macroeconomic ones. Among the parameters that describe borrowers, the most mentioned parameters are:

- age - Avanzini, 2015, pp.1-41; Beckmann, 2017, pp.1-18; Bilyk, 2017, pp.21-33; Campbell, 2015, pp.1495-1554; Csizmadly, 2017, pp.249-275; Gerlach-Kristen, 2018, pp.545-567; Lydon, 2013, pp.117-150; Van Ooijena, 2016, pp.1-17;
- credit history - Beckmann, 2017, pp.1-18;
- credit score - Elul, 2010, pp.490-494; Foote, 2017, pp.1-56; Fuster, 2015, pp.1-61; Goodman, 2010, pp.280-294; Gyourko, 2014, pp.87-96; Harrison, 2011, pp.1-18; Jones, 2015, pp.167-205; Lee, 2016, pp.440-456;
- debt service ratio - Figueira, 2005, pp.1755-1769; Foote, 2017, pp.1-56; Harrison, 2011, pp.1-18; Jones, 2015, pp.167-205; Kelly, 2018, pp.322-335; Kukk, 2016, pp.1-36; Lee, 2016, pp.440-456; Lydon, 2013, pp.117-150; Van Ooijena, 2016, pp.1-17;
- education - Avanzini, 2015, pp.1-41; Beckmann, 2017, pp.1-18; Gerlach-Kristen, 2018, pp.545-567; Van Ooijena, 2016, pp.1-17;
- employment conditions - Gyourko, 2014, pp.87-96; Harrison, 2011, pp.1-18; Jones, 2015, pp.167-205; Lydon, 2013, pp.117-150; Van Ooijena, 2016, pp.1-17;
- family status - Csizmadly, 2017, pp.249-275; Jones, 2015, pp.167-205 etc.

Transaction specific parameters that are often found to be very significant risk drivers are housing loan's:

- initial LTV ratio - Avanzini, 2015, pp.1-41; Bilyk, 2017, pp.21-33; Campbell, 2015, pp.1495-1554; Elul, 2010, pp.490-494; Foote, 2017, pp.1-56; Fuster, 2015, pp.1-61; Goodman, 2010, pp.280-294; Harrison, 2011, pp.1-18; Hott, 2015, pp.183-194; Jones, 2015, pp.167-205; Kelly, 2018, pp.322-335; Lee, 2016, pp.440-456; Lydon, 2013, pp.117-150; Van Ooijena, 2016, pp.1-17;
- current LTV ratio - Avanzini, 2015, pp.1-41; Bian, 2018, pp.1-12; Bilyk, 2017, pp.21-33; Campbell, 2015, pp.1495-1554; Elul, 2010, pp.490-494; Foote, 2008, pp.234-245; Foote, 2017, pp.1-56; Fuster, 2015, pp.1-61; Gerlach-Kristen, 2018, pp.545-567; Goodman, 2010, pp.280-294; Gyourko, 2014, pp.87-96; Hott, 2015, pp.183-194; Jones, 2015, pp.167-205;

- Kelly, 2018, pp.322–335; Lee, 2016, pp.440-456; Lydon, 2013, pp.117–150; Van Ooijena, 2016, pp.1-17;
- interest rate volatility - Campbell, 2015, pp.1495-1554; Csizmady, 2017, pp.249–275; Foote, 2017, pp.1-56; Fuster, 2015, pp.1-61; Harrison, 2011, pp.1-18; Hott, 2015, pp.183-194; Jones, 2015, pp.167-205; Van Ooijena, 2016, pp.1-17;
  - foreign currency loan - Beckmann, 2017, pp.1-18; Csizmady, 2017, pp.249–275;
  - Loan-to-income ratio - Bilyk, 2017, pp.21-33; Campbell, 2015, pp.1495-1554; Figueira, 2005, pp.1755–1769; Fuster, 2015, pp.1-61; Gerlach-Kristen, 2018, pp.545-567; Harrison, 2011, pp.1-18; Kukk, 2016, pp.1-36; Lee, 2016, pp.440-456;
  - negative equity - Aron, 2016, pp.32-53; Gerlach-Kristen, 2018, pp.545-567 etc.

Most commonly used macro factors are:

- GDP growth - Hott, 2015, pp.183-194; Lee, 2016, pp.440-456;
- house price index - Aron, 2016, pp.32-53; Avanzini, 2015, pp.1-41; Campbell, 2015, pp.1495-1554; Foote, 2017, pp.1-56; Gerlach-Kristen, 2018, pp.545-567; Harrison, 2011, pp.1-18; Hott, 2015, pp.183-194; Jones, 2015, pp.167-205; Lydon, 2013, pp.117–150;
- income volatility - Foote, 2017, pp.1-56;
- interest rates volatility – Beckmann, 2017, pp.1-18; Calhoun, 2002, pp.9-33; Campbell, 2015, pp.1495-1554; Fuster, 2015, pp.1-61; Goodman, 2010, pp.280–294; Harrison, 2011, pp.1-18; Hott, 2015, pp.183-194; Lee, 2016, pp.440-456;
- unemployment rate - Aron, 2016, pp.32-53; Elul, 2010, pp.490-494; Foote, 2017, pp.1-56; Gerlach-Kristen, 2018, pp.545-567; Gyourko, 2014, pp.87-96; Hott, 2015, pp.183-194; Lydon, 2013, pp.117–150 etc.

Aron and Muellbauer (2016) based on mortgage data from UK analysis discovered strong correlation between arrears and aggregate debt–service ratio, the proportion of mortgages in negative equity and the unemployment rate. Campbell and Cocco (2015) developed model incorporating household income, house price, inflation, and interest rate risk. Created model highlights that mortgage default depends not only on the extent to which a borrower has negative home equity, but also on other factors, e.g. interest rates and income volatilities etc. Fuster and Willen (2012) also highlight the impact of negative equity and variations in interest rates on mortgages delinquencies. Their study was based on US mortgage micro-data. Gerlach-Kristen and Lyons (2018) applied regression analysis to national-level panel data to examine mortgage arrears in 15 EU countries. Researchers conclude that there isn't clear evidence that negative equity per se is associated with higher arrears, but the combination of affordability problems and negative equity, which makes it impossible for financially strained households to move to cheaper places and which the literature refers to as a dual trigger situation, seems to matter for longer-term arrears. Hott (2015) developed mortgage loss model calibration based on US and Switzerland data and conclude that loss rates are positively influenced by the house price level, the loan-to-value of mortgages, interest rates, and the unemployment rate, but negatively influenced by the growth of house prices and the income level. Kelly and O'Toole (2018) found that default increases with originating loan-to-value and falling with origination debt service ratio. The literature analysis provides some valuable guidance on housing loans risk drivers. The ability of borrowers to pay a mortgage can be affected by external circumstances such as unemployment and income decline, particularly during periods of crisis and recession, and by households themselves – the ability to balance their cash flow and competitiveness in the labour market. In the years of crisis, a sharp decline in housing prices is also playing an important role, and consequently less could refinance existing liabilities or sell mortgage without significant losses.

Another important conclusion from the literature analysis is that there are different laws in different countries and consequently the results of studies cannot be interpreted unambiguously without taking into account these specificities.

### 3. CHAPTER MACRO LEVEL RISK DRIVERS AND MODELS

#### 3.1. The model

Let  $HoNPL_t$  be dependent variable 'Housing loans nonperforming ratio' in year  $t$ . Further, let  $x_{1t}, \dots, x_{kt}$  denote independent variables and  $b_{1t}, \dots, b_{kt}$  denote regression coefficients of independent variables, than the model can be expressed as in equation:

$$HoNPL_t = f(x_{1t}, \dots, x_{kt}) + \varepsilon_t \quad (1)$$

where  $\varepsilon_t$  – the error term.

#### 3.2. Data

For research macro indicators on first stage where selected based on literature review. Indicators list, data source and correlation coefficients with 'Housing loans non-performing ratio' are presented in following table.

Indicator	Unit of measure	Abbreviation	Data source	Correlation
Consumer price index	%	CPI	CSB	-0,4299
Foreign direct investments growth	%	FDI	BoL	-0,5826
GDP growth	%	GDP	CSB	-0,6371
House price index	%	HPI	CSB	-0,7002
Household disposable income growth	%	HDI	Eurostat	-0,7942
Household gross debt-to-income	%	GDI	Eurostat	0,5021
Housing loans interest rate	%	HIR	ECB	-0,1665
Net wages growth	%	NWG	CSB	-0,7315
Unemployment rate	%	UPL	Eurostat	0,8885

*Table 1: Macro indicators and their correlation with HoNPL*

Macro indicators data for research where collected from Bank of Latvia (BoL), Central Statistical Bureau of Latvia (CSB), European Central Bank (ECB) and Eurostat. From table 1 one can see that the highest correlation with housing  $HoNPL$  in Latvia during years 2004-2017 showed following indicators: 'Unemployment rate' (0,8885), 'Household disposable income growth' (-0,7942), 'Net wages growth' (-0,7315), 'House price index' (-0,7002) etc. In the same time 'Housing loans interest rate' had low impact (-0,1665) on  $HoNPL$ , which isn't consistent with revealed in studies, e.g. Campbell (2015), Csizmady, (2017), Foote, (2017), Fuster (2015), Harrison (2011), Hott (2015) and Jones, (2015).

*Figure following on the next page*



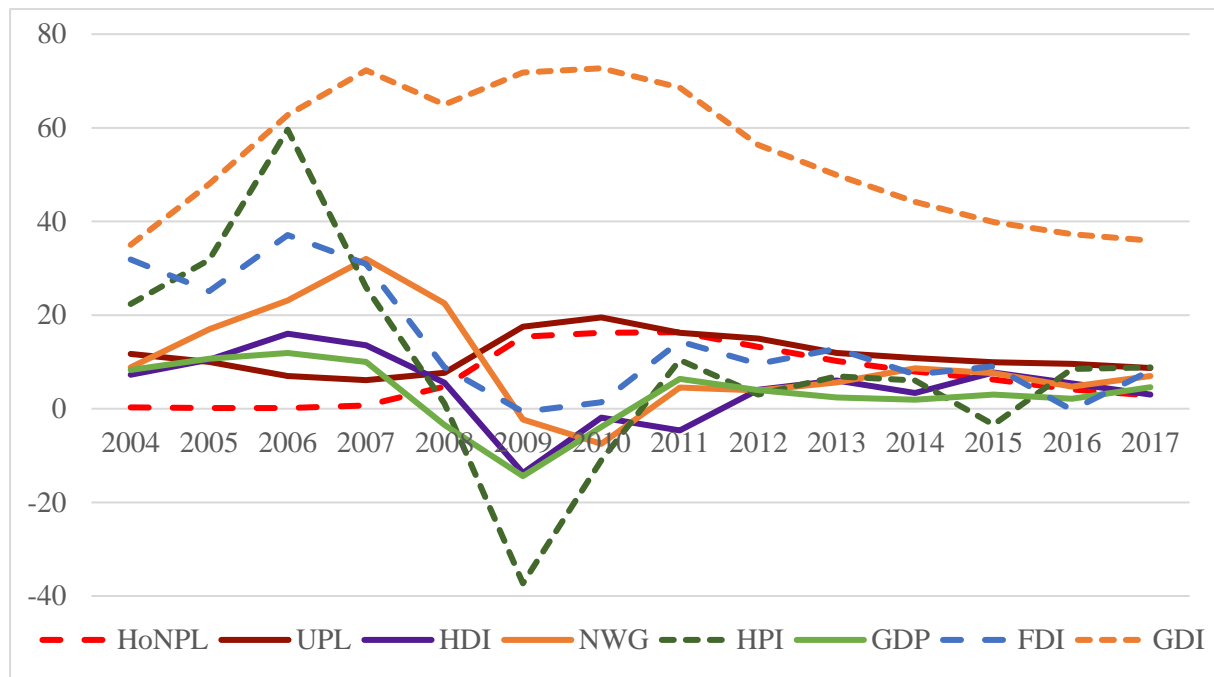


Figure 2: Macro indicators and HoNPL (Eurostat, BoL, FCMC, CSB of Latvia data)

### 3.3. Results

In the first stage based on the method of least squares 59 regression models (7 linear univariate, 7 nonlinear and 45 multivariate) have been created, which faced trough  $F$  test at confidence level of 0,95 ( $\alpha=0,05$ ). In the second phase, those who failed regression coefficient statistical stability  $t$ -test at confidence level of 0,95 were removed. The statistics of regression models faced trough  $t$ -test are aggregated in following table.

#	Model type	Variable	$R^2$	$F$	$p$ - value	Durbin-Watson
1.	1-factor, linear	UPL	0,7895	48,7568	<0,0001%	0,8687
3.	1-factor, linear	HDI	0,6307	22,2021	<0,0001%	0,8037
5.	1-factor, linear	NWG	0,5351	14,9625	<0,0001%	0,4347
7.	1-factor, linear	HPI	0,4903	12,5029	<0,0001%	0,6964
9.	1-factor, linear	GDP	0,4058	8,8799	<0,0001%	0,5330
11.	1-factor, linear	FDI	0,3394	6,6789	<0,002%	0,4991
18.	2-factor, linear	UPL, GDP	0,9098	60,5098	<0,0001%	0,7224
20.	2-factor, linear	UPL, GDI	0,5745	8,1015	<0,0003%	0,8415
43.	3-factor, linear	UPL, FDI, GDI	0,9072	35,8608	<0,0001%	2,5796
44.	3-factor, linear	UPL, HPI, GDI	0,9496	69,0275	<0,0001%	2,4679
46.	3-factor, linear	UPL, GDP, GDI	0,9443	62,1490	<0,0001%	1,9179
47.	3-factor, linear	UPL, FDI, HIR	0,8338	18,3981	<0,0001%	2,7174
48.	3-factor, linear	UPL, GDI, HST	0,7288	9,8531	<0,0001%	1,4827
56.	4-factor, linear	UPL, HDI, FDI, GDI	0,9494	46,9194	<0,0001%	1,6754

Table 2: Final regression models statistics

Statistics in table 2 show that 5 of the models created allow to explain at least 90% and three of them at least 94% of housing non-performing loans ratio fluctuations with changes in variables included. In order to compare those five model and select the model with highest statistical stability residuals were analyzed, see following figure.



Figure 3: Best fit model's residuals

Residuals analysis shows that all five models considered provide a sufficiently high level of stability and a minor error during periods of sustainable development, while in crisis years individual models, e.g. #18, are becoming manifestly unstable. Based on Durbin-Watson statistic the preference should go to model #46:

$$HoNPL_t = 1,0547 * UPL_t - 0,5911 * GDP_t + 0,0816 * GDI_t - 7,8578 \quad (2)$$

The results are statistically significant ( $F = 62,1490, p < 0,00001\%$ ). Model (2) allow to explain c.a. 94% of housing loans non-performing variations with  $UPL_t, GDP_t$  and  $GDI_t$  variations.

Variable	Regression coefficient	$p$ - value
Unemployment rate	1,0547	0,0002%
Gross domestic product	-0,5911	0,0003%
Household gross debt-to-income	0,0816	2,4257%
Intercept	-7,8578	0,2325%

Table 3: Model #46 regression coefficients and  $p$ -values

## 4. CHAPTER MICRO LEVEL RISK DRIVERS AND MODELS

### 4.1. Data

The primary data used in micro level study come from two housing loans samples – one include borrowers age, credit history, Loan-to-Value (LTV) and NPL status at the end 2011 and other at the end 2017. In order to solve NPL micro numerosity issues following indicators buckets were created:

- age – up to 25; 25-30; 31-35,...;
- credit history – score up to 10; 11-20; 21-30,...;
- LTV – up to 0,5; 0,5-0,6; 0,61-0,7,...

Following figures show borrowers age and NPL, credit history and NPL, LTV and NPL distributions.

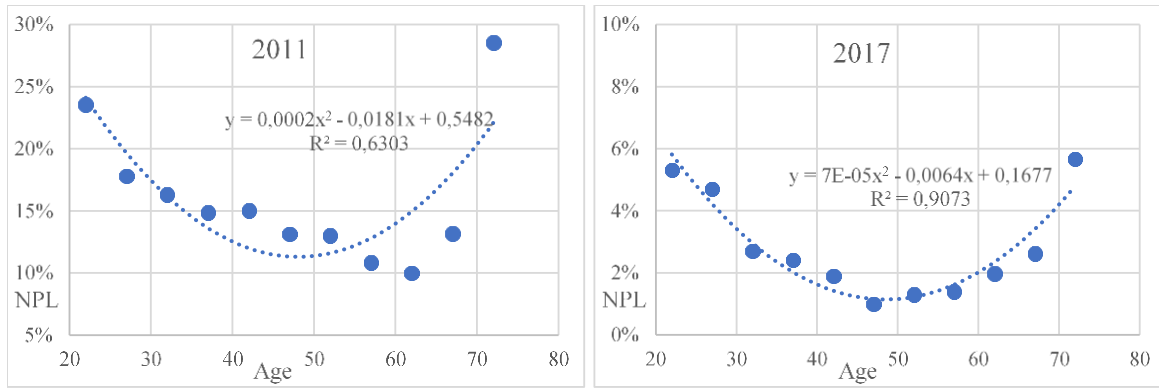


Figure 4: Borrowers age and NPL's distributions

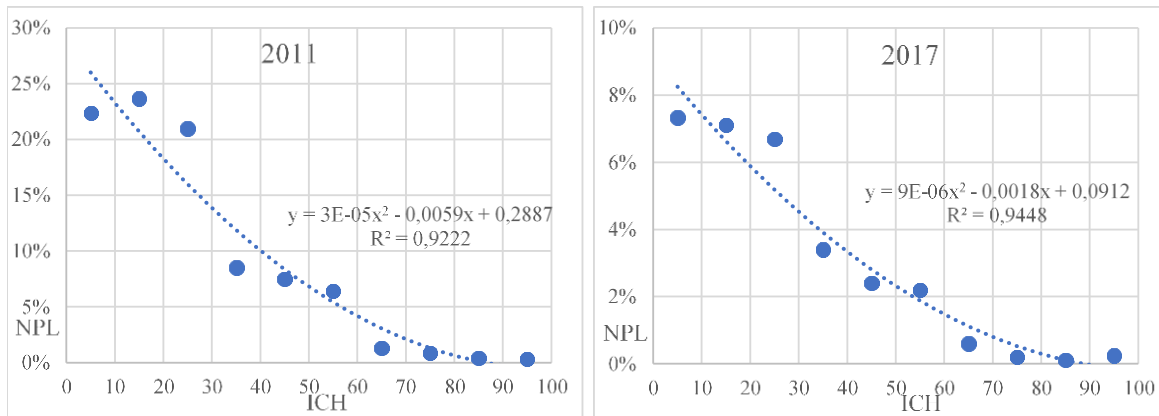


Figure 5: Credit history and NPL's distributions

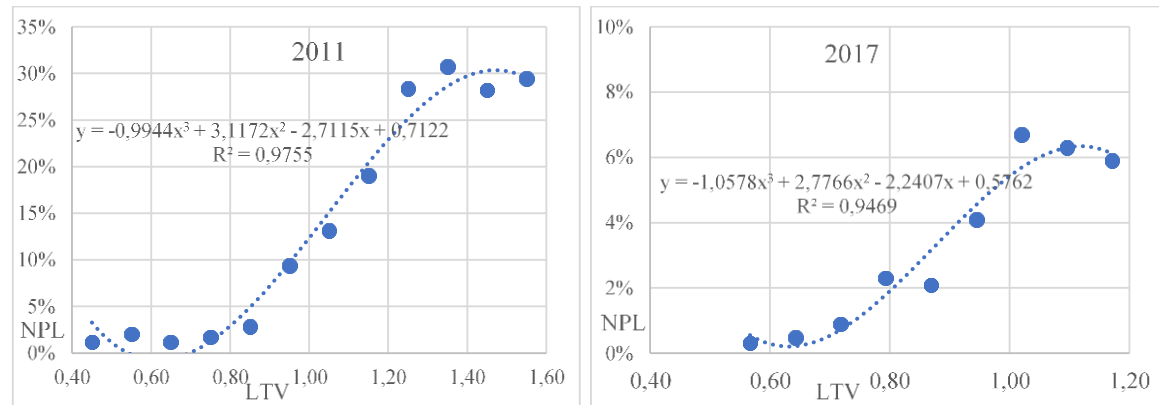


Figure 6: LTV's and NPL's distributions

## 4.2. Results

Using method of least squares linear and nonlinear models were created. Best fit model's statistics are aggregated in following table.

Model	Model type	$R^2$	$SE$	$F$	$p$ -value	$t$ -test max $p$ -value
Age2011	Second order polyn.	0,6303	0,0378	6,8186	1,869%	<0,650%
Age2017	Second order polyn.	0,9073	0,0056	39,1297	0,007%	<0,002%
ICH2011	Second order polyn.	0,9222	0,0302	41,5111	0,013%	<6,064%
ICH2017	Second order polyn.	0,9448	0,0079	59,8934	0,004%	<4,235%
LTV2011	Third order polynom.	0,9755	0,0230	106,219	0,0001%	<0,395%
LTV2017	Third order polynom.	0,9469	0,0075	29,7198	0,130%	<7,405%

Table 4: Best fit model's regression statistics

Regression statistics show that the statistical stability of the models created is high –  $F$ -test  $p$ -values  $< 2\%$ . Also regressions coefficients  $t$ -tests demonstrate model's stability. All models allow to explain more than 90% (except Age2011 with 63%) of  $HoNPL$  fluctuations with changes in variables included. Comparing models with 'Age' as variable, it can be seen that this risk indicator works not so well in time periods with fragile economic development (recessions and crises). Borrower's credit history is as stable risk indicator for both stable and volatile economic conditions periods of time. Meanwhile, LTV is slightly better risk indicator in fast-changing house price periods of time. Residuals are shown in following figures.

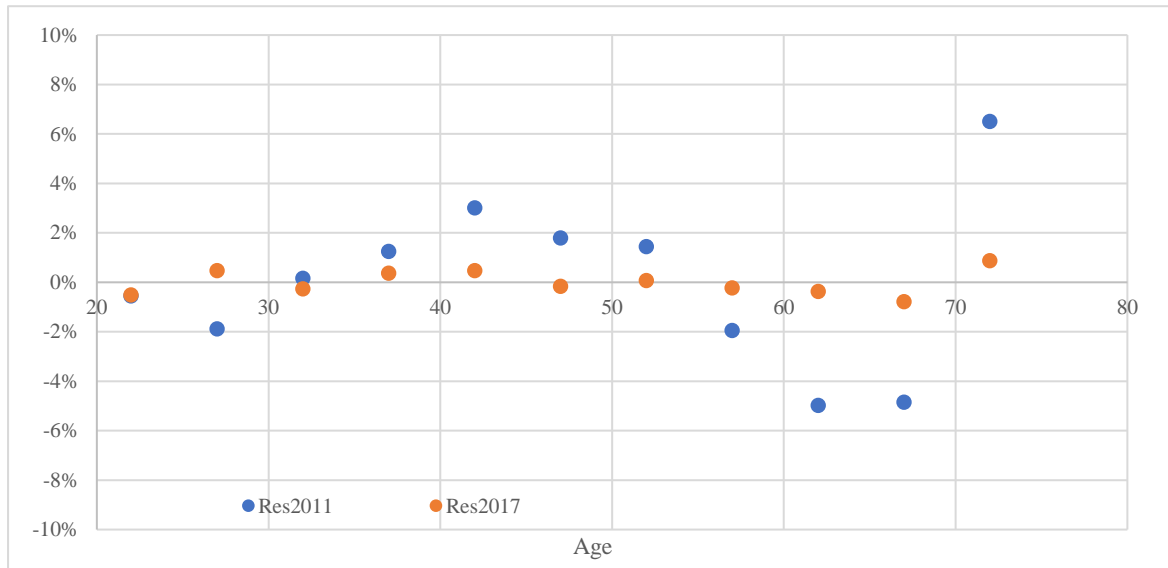


Figure 7: Residuals distributions for models with age

Residuals analysis for created models with age shows that Age2017 provide a sufficiently high level of stability and a minor error for all age groups, while during crisis years forecasts for age 60+ is related with high uncertainty.

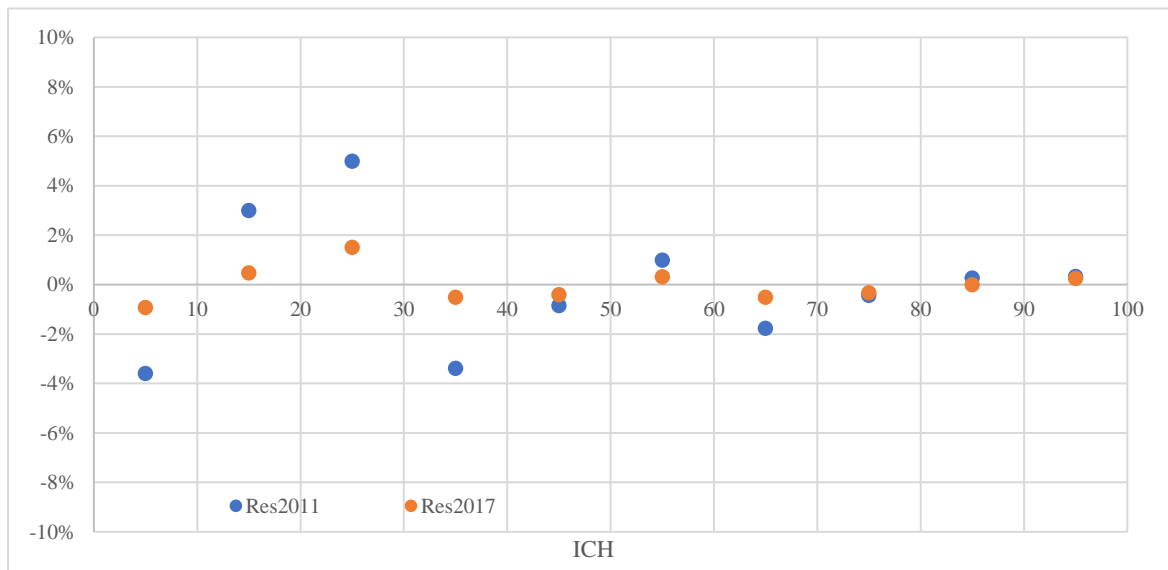
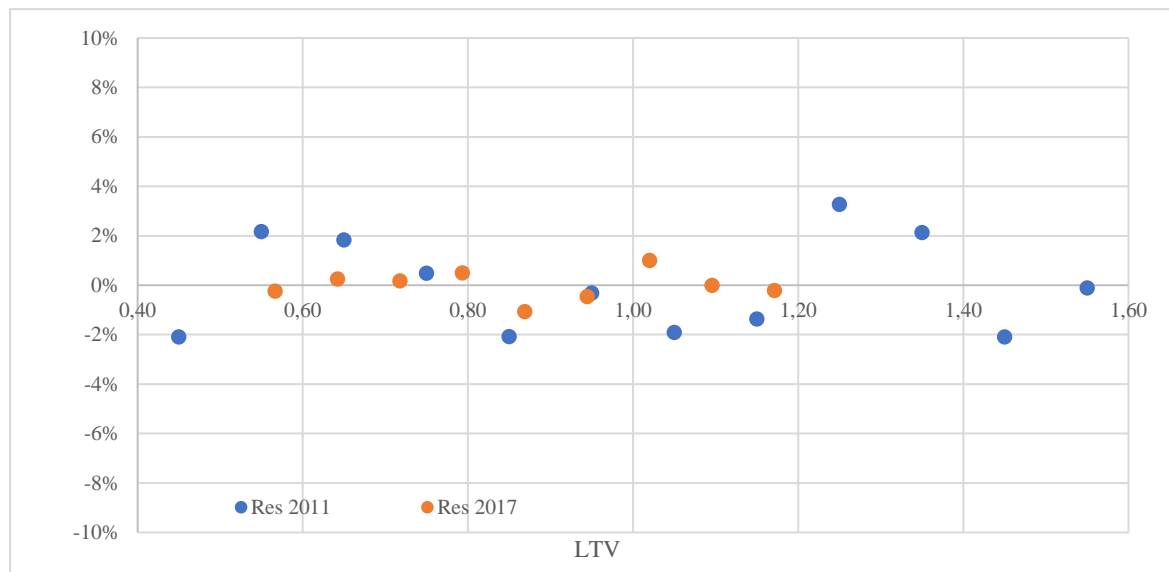


Figure 8: Residuals distributions for models with ICH

Residuals analysis for created models with credit history shows that ICH2017 provide a sufficiently high level of stability and a minor error for all ICH scoring groups, while during

crisis years forecasts for ICH scoring groups with risk 'above average' is related with high uncertainty.



*Figure 9: Residuals distributions for models with LTV*

Residuals analysis for created models with LTV shows that LTV2017 provide a sufficiently high level of stability and a minor error for all LTV buckets, while during crisis years forecasts for LTV buckets 125% + is related with high uncertainty.

## 5. CONSLUSION

The severe financial crisis and the subsequent slow recovery in Latvia have had a significant impact on both the banking business, suffering massive losses from not always sufficiently carefully evaluated credit applications and forcing a review of the credit approval standards set to date, as well as the housing market, which has stagnated for years after the crisis, and households which have been unable to repay often the commitments created. It is important to identify both macro and micro risk drivers, since credit risk management tasks cover the assessment of the total risk of the credit portfolio in perspective, such as the amount of expected losses and capital requirements for covering credit risk for business plan and internal capital adequacy assessment needs, and the credit risk causation study to make sound business activation or risk mitigation decisions. The quality of the analysis of household credit risks can be ensured by the availability of a number of models and the possibility of use them in combination to assess expected risk levels, as a weighted average of a number of outcomes, for example, taking into account the availability of indicator forecasts, the level of its assurance and other considerations. Before applying the models drawn up and framed, it is important not only to verify their statistical stability, but also to carefully assess model errors (residuals), as the research carried out shows that each model has different behaviour over different periods of the economic cycle and should not be ignored. According to the research carried out, the most influential macro risks drivers for housing loans are unemployment, household gross disposable income, GDP, house price index, wages growth, and from micro drivers - credit history, age, LTV etc. The results of the study in this respect largely coincide with those previously carried out and described in accessible literature. However, in addition, it can be concluded that each of these indicators has both certain advantages and shortcomings, which differ in the various periods of economic development. It is important to remember that once created econometric models cannot be considered non-changeable - they should be regularly tested and recalibrated if necessary.

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# ENDOGENOUS DETERMINANTS ON THE BEHAVIOUR OF TOTAL REVENUE IN LEGACY TYPE AIR TRANSPORT COMPANY: A EMPIRICAL STUDY

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## ABSTRACT

*The liberalization of air transport has led to a competitive environment in a highly regulated industry in the operational plan, conditioning the cost structures of the companies. The competitive factor shifts to the revenue management. The parallel development of Information and Technology (IT) industries creates the conditions for the development of the "industrialization of revenue management". Over the past thirty years several studies and develop applications and optimization models of total revenue, in the first instance for one given flight and currently in the carrier network. These models, mostly use statistical information to, through various processes, allow an analyst to decide which model best fits the demand. The present work aims to determine the factors that influence the total revenue and contribute to the study of the behavior of this variable. Thus using the method of Partial Least Squares Regression (PLS-R), it was intended to study what are the determinants and behavior of total revenue of a Legacy carrier in three types of routes. We conclude that it is possible to monitor the behavior of a Revenue Management system through the observation of the behavior of Total revenue during the period of availability of rates for a given flight.*

**Keywords:** *Air Transport, Revenue Management, Total Revenue, Partial Least Squares*

## 1. INTRODUCTION

Quality discrimination has not proven an effective mean to avoid migration of high fare passengers to low fair availability (Doganis, 2002). Revenue Management is a managing technic that endeavours maximizing the revenue of a perishable asset (Revenue Management Society, 2013) and considered by some authors as the “industrialization” of the entire demand-management process (Tallury & Ryzin, 2005). Inter-temporal segmentation and implicit segmentation emerge as means to take advantage of consumer heterogeneity (Alderighi, 2010) and it's used alike by low cost carriers as per legacy carriers (Alderighi, 2011). The balance between dynamic pricing, load factors and low operational cost has been pointed as defining characteristic of the low cost carriers (Maligheti et al., 2009). The competition with low cost carriers on the feeder routes presents a threat to established hubs (Redondi et al., 2012). Legacy carriers have responded with more complex product segmentation (Hazldine, 2011). IATA suggested in 2009 a gravity model to explain premium demand (IATA, 2011) in which the distance between origin and the destiny is a significant variable. Based on the approach in “The Theory and Practice of Revenue Management” (Tallury & Ryzin, 2005), revenue management attempts to support the decision maker in three levels:

- Structural decisions, defining the product



- Price decisions, defining the product reference price
- Quantity decisions, allocating product to expected demand

It is our understanding that most of the effort applied to the development of revenue management concerns modelling of the price and quantity decisions. This approach provides first level algorithms that deal with allocation and demand problems supervised by analysts. These algorithms grow more and more complex and computationally demanding. Our approach intends to explore less demanding analytical methods in the support of revenue management strategical level decisions.

## **2. MATERIALS AND METHODS**

### **2.1. Data**

The database used for the present study was supplied by a legacy type carrier, comprising 348.975 observations with 8 selected variables each associated to the observed individual sold tariffs in three distinct routes. The observations were made between 24<sup>th</sup> of June 2011 and 31 December 2012. The first step was to reduce the dimension of the sample, the method used was to study total revenue per flight instead of the behaviour of individual tariffs sold, the point of was to use the study of aggregated demand instead of individual demand in order to support strategic decisions and product modelling. Through this process the dimension of the sample was reduced from 2.791.800 to 58.752 units, and the number of studied variables increased from 8 to 16. The data used due to confidentiality requirements by the carrier didn't allow the use of exogenous variables since the routes were not identified thus being impossible to evaluate the influence of econometric parameters like Gross Domestic Product (GDP). Because of this limitation this study focus on the impact of endogenous variables on the total revenue per flight. The suited independent variables where:

- Quantitative variables:
  - DV - Flight Date
  - ID - Flight Identification associated with one and one only combination of DV/OD/Hr
  - RT - Total revenue
  - Dt - Total distance
  - PT - Total passengers per Flight
  - Ct - Amount of sells in a given day before the flight
  - Fr - Frequency given by the number of flight on the same route in a given day
  - PD - Total amount of sold tariffs in D type Class, economy
  - PB - Total amount of sold tariffs in B type Class, economy
  - PC - Total amount of sold tariffs in C type Class, economy
  - PP - Total amount of sold tariffs in P type Class, executive
  - PE - Total amount of sold tariffs in E type Class, executive
- Qualitative variables:
  - DS - Total sells in a flight in a determined week day
  - Cd - Weekend or Week flight
  - TR - Route type concerning existent competition, Legacy type, Low cost carrier or mixed
  - Hv - Schedule before or after 12:00 LCL time

### **2.2. PLS-R**

This method was developed by Wold (1985; 2002) and used in the Path Model (Tenenhaus et al., 2005). PLS-R was further developed and studied by Kowalski (1986) and Hoskuldsson (1988). Considering the purpose of using a less demanding analytical method, the option was PLS-R (Partial least Square Regression) since it is less demanding in scale, sample dimension

and residual distribution (Vicente, 2015). PLS is adequate in the presence of large number of independent variables even if high multicollinearity exists (Morellato, 2010). This technic synthesises a X and Y matrix through latent variables, considering that Y is a matrix of dependent variables of X being X the matrix of independent variables (Tenenhaus et al., 2007). PLS produces scores of the components as linear combinations of the original X matrix variables and through the correlation of the components identifies the variables to exclude on the output model. This method achieves the prediction and explanation capability of a model being stronger in the first (Vicente, 2015). It correlates the variations between the different variables (Wooldridge, 2005; Vicente, 2015; Cavaco, 2016).

### 3. RESULTS

#### 3.1. Statistics

Table 1: Statistics

Statistics						
Variables		Observations	Minimum	Maximum	Mean	Standard deviation
RT		3672	103,00	108436,43	8870,60	13012,22
Ct		3672	4,28	207,39	43,20	28,66
Dt		3672	200,00	3000,00	586,27	750,75
RT/Dt/PT		3672	0,02	1,22	0,23	0,18
Fr		3672	1,00	6,00	4,49	1,39
PD		3672	0,00	91,00	22,22	17,73
PB		3672	1,00	218,00	53,04	34,88
PC		3672	0,00	126,00	13,40	15,46
PP		3672	0,00	31,00	2,68	3,96
PE		3672	0,00	35,00	3,28	4,06
TR	LCC	3672	0	1	n/a	n/a
	Legacy	3672	0	1	n/a	n/a
	Mixed	3672	0	1	n/a	n/a
DS	Sunday	3672	0	1	n/a	n/a
	Wednesday	3672	0	1	n/a	n/a
	Thursday	3672	0	1	n/a	n/a
	Monday	3672	0	1	n/a	n/a
	Friday	3672	0	1	n/a	n/a
	Saturday	3672	0	1	n/a	n/a
	Tuesday	3672	0	1	n/a	n/a
Cd	Week day	3672	0	1	n/a	n/a
	Weekend	3672	0	1	n/a	n/a
HV	< 12:00	3672	0	1	n/a	n/a
	≥12:00	3672	0	1	n/a	n/a

#### 3.2. Model test

The model was verified with cross-validation method (R1) considering the restriction  $Q^2 > 0.05$ , thus achieving global model quality of 67,4% with the second component model, being the X

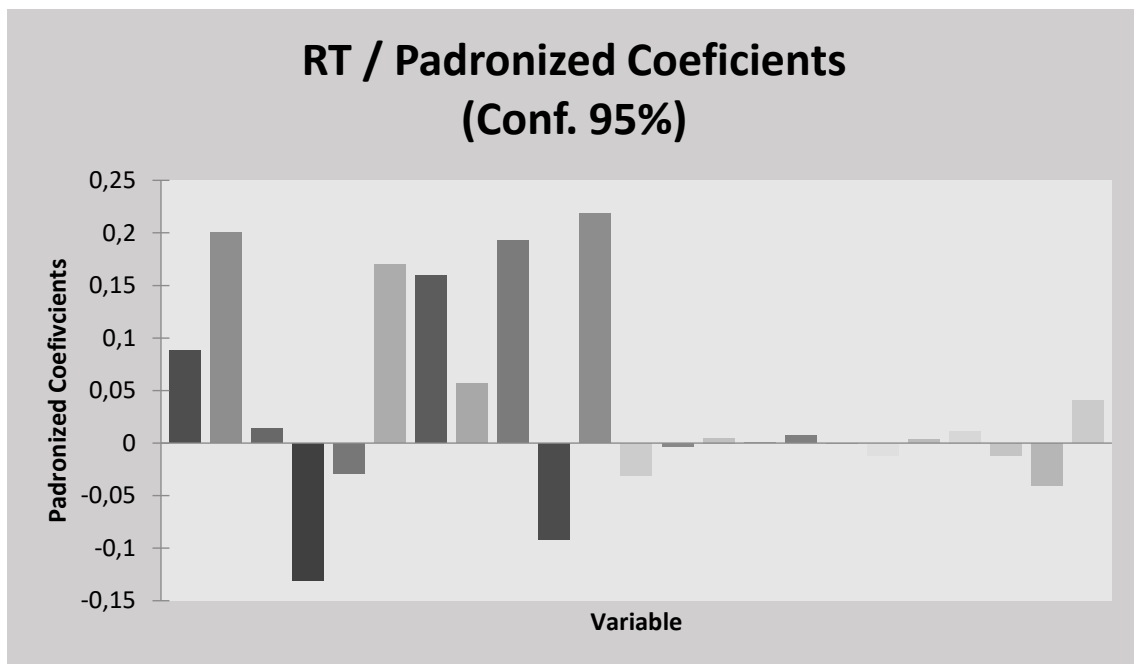
matrix variations explained in 35,4% and the Y variation by 90,4%, presenting a powerful prediction capability of the dependent variable matrix Y. (see Table 2)

*Table 2: Model tests*

Model	R <sup>2</sup> X	R <sup>2</sup> Y	Limit	Q <sup>2</sup>	Test.
Component	Cumulative	Cumulative		Cumulative	
1	0,210	0,855	0,050	0,537	R1
2	0,354	0,904	0,050	0,674	R1

### 3.3. Standardized Coefficients

The analysis of the obtained standardized coefficients quantifies, with a statistic relevance of 95%, the relation between the linear model produced coefficients and dependent variable RT (see Figure 1).



*Figure 1: The analysis of the obtained standardized coefficients*

### 3.4. VIP values of first component

The following figure represents the variable influence values on the projection relative to the first component, the confidence intervals are displayed using the statistical method Jack-Knifing. The variables showing values higher than 0,8 are considered more relevant (Wold,1994) (see Figure 2).

*Figure following on the next page*

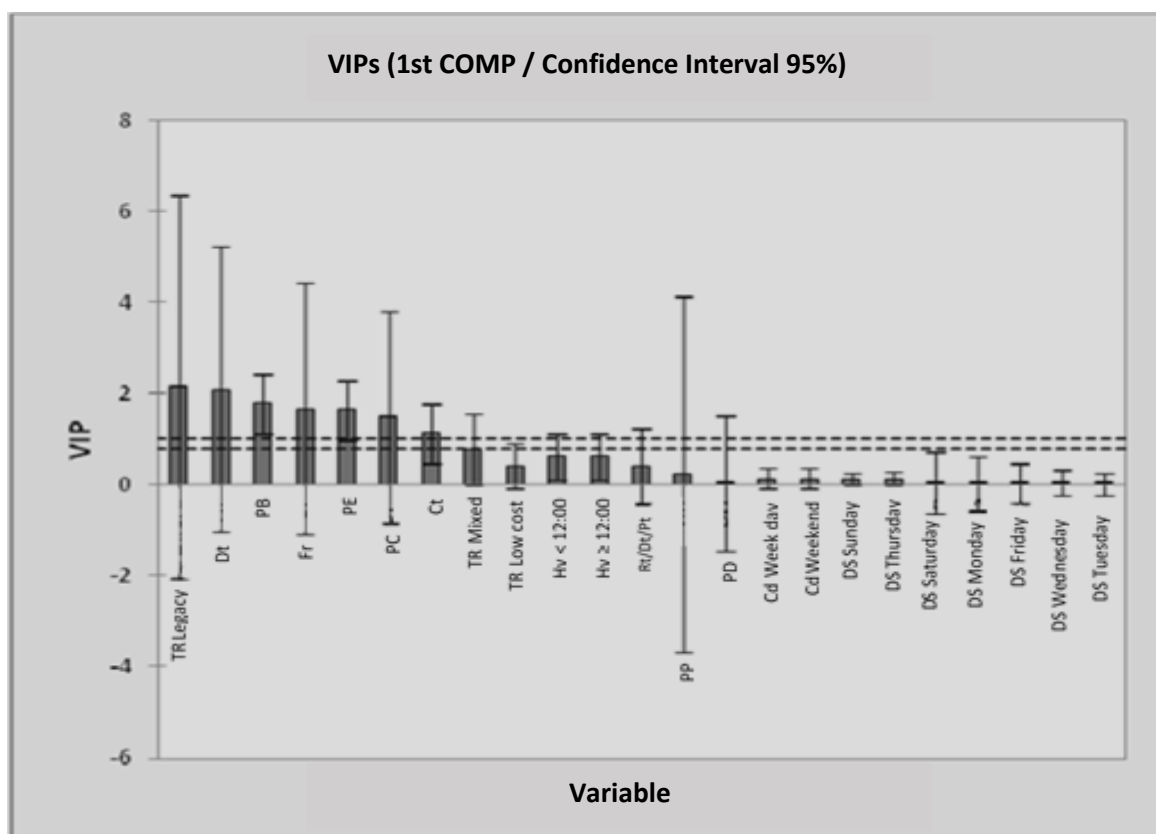


Figure 2: Variable influence values on the projection relative to the first component

### 3.5. Model Components Analysis

The  $t^m$  components or scores allow the observation in a plan of the variance relation between two components. In this analysis we confirm that models tend to a linear distribution (see Figure 3).

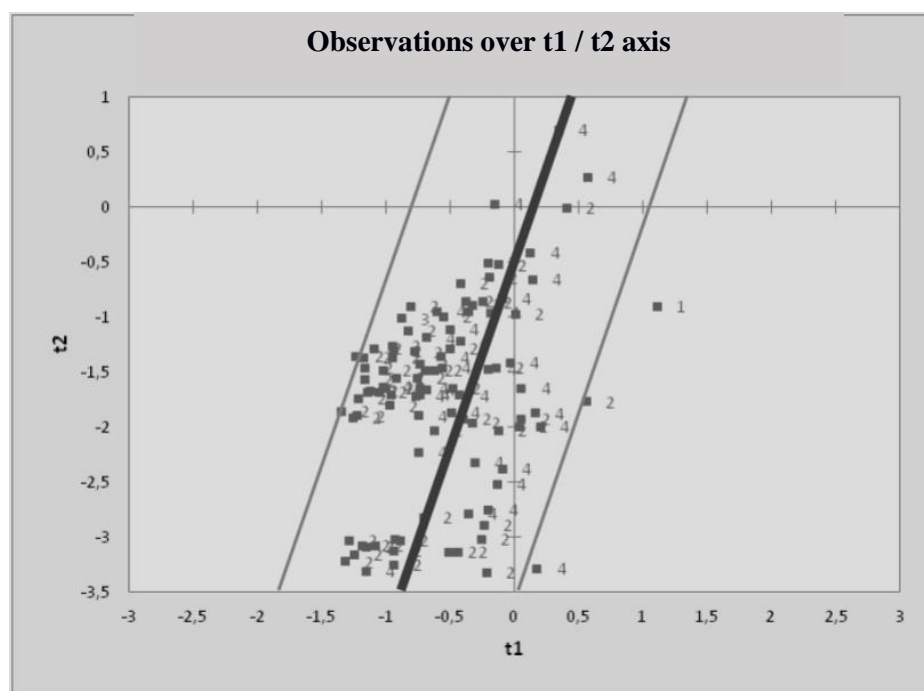


Figure 3: Model Components Analysis

### 3.6. Predicted Total Revenue and Observed Total Revenue

Observing the relation between the calculated model predicted Total Revenue and the Observed Total Revenue using the cross validation methodology it's observable that although the model tend to be linear there are two observable clusters. The model is more accurate calculating flights with a total revenue below the 30.000 euros threshold. This threshold in our database is related to routes where low cost carriers compete, being the higher values associated with long haul flights (see Figure 4).

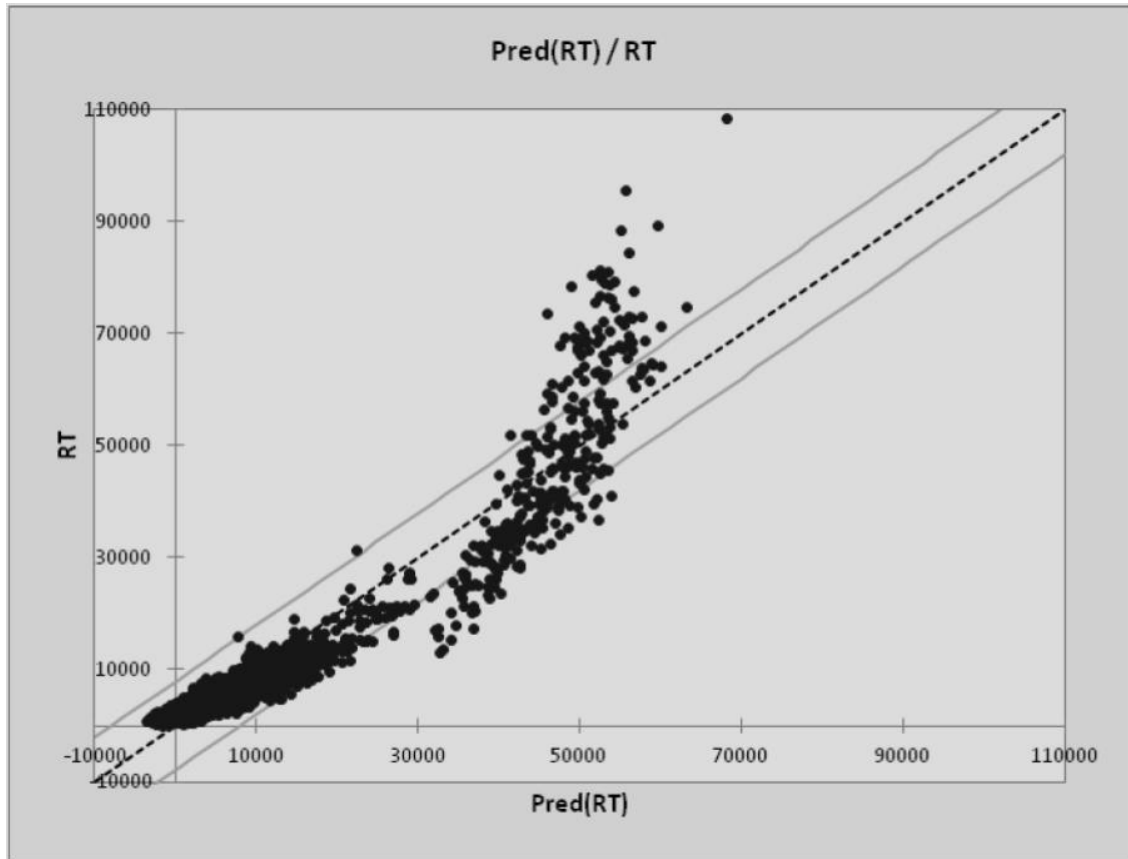


Figure 4: Predicted Total Revenue and Observed Total Revenue

## 4. DISCUSSION

Through the analysis of the standardized coefficients we identify that the operation on a route with legacy type only competition (TR-Legacy) has the highest positive correlation with the Total Revenue (RT). Type B,C and E tariffs have the highest positive correlation. Type P tariff has smaller positive correlation and type D shows a negative correlation with RT. Competition with low cost carriers and Frequencies showed the highest negative correlation with RT. This analysis is supported by the regression model obtained using the PLS-R. The VIP analysis shows a significant influence on the total revenue when operating in a legacy type route, it also shows that B,C and E type products are the most significant in terms of total revenue. The number of frequencies per route as influence as it as the route with LCC competition. Literature states that it should be a positive correlation of the number of frequencies with the demand (Dogannis, 2002; Wensveen, 2007). The frequency variable is the only showing an unexpected behaviour. We consider that this behaviour shows that in this particular studied routes a saturation has been achieved, meaning the point where higher number of frequencies would create more customer option and induce further demand is passed and a dilution of demand in the offered product is observed. The model establishes a clear positive correlation between total revenue and total flight distance and routes without competition as expected.

Due to the capacity of eliminating collinearity it is possible to understand the products with higher correlation with total revenue, being in the studied model the B,C and E tariffs that present higher positive correlations. The D tariff is used as a discount tool showing negative correlation with total revenue. It is also show negative correlation of low cost competition and frequencies per route with total revenue. The different behaviour of the prediction of long haul and medium haul flights means that the variance of studied dependent variables differs in this two types of routes. In this particular aggregated model the long haul flights shown an optimistic prediction behaviour of the total revenue. This supports the need of different product models for different types of flights.

## 5. CONCLUSIONS

We conclude that the PLS technic allows the analysis of the impact of independent variables in the study of the total revenue behaviour. This method may be used by analysts to support the understanding of variables influence in total revenue thus allowing to optimize product design and the development of red flags alerting to negative unforeseen impacts in revenue like in our study was the case of the variable frequency. The graphic presentation allows the interpretation of huge amounts of data in an intuitive way appropriate for executive briefings.

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## MODELING COMPLEX TRAFFIC SYSTEM BEHAVIOUR

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### ABSTRACT

*To have a better understanding what are the crucial points of the Hungarian's Traffic network, we will evaluate the background knowledge, which we will receive by modelling complex system with an AI-based Knowledge Based System. The expected outcome will be a time breakdown of the traffic infrastructure occupation, helping to localize the bottlenecks in the traffic network, both in time and location and evaluate the characteristics of these bottlenecks based on the weather change. The natural complexity of the traffic network will be evaluated in the research by identifying nonlinearity and chaos in the profile of daily truck routes in Hungary. More than the entire population's 5% will be represented in the research. Different tools will be used for the evaluation, such as Recurrence Quantification Analysis, to manifest the nonlinearity and chaotic attributes of the traffic network. In the research a one-week long timeframe will be evaluated in a knowledge management system at first glance, which has a 2 second frequency. This data will be compared with the weather data. From the mass data, different segments will be formed, based on the truck axle type, which type of cars are more affected by the bottleneck and weather change. This data will be aggregated and evaluated. The truck density, the average speed, number of stops, ride length, rainfall, temperature, number of sunny hours.*

**Keywords:** Complexity, Knowledge based system, Traffic monitoring

### 1. INTRODUCTION

We would like to introduce a new approach toward traffic monitoring. So far in most of the cases this topic was investigated separately by different disciplines. The major disciplines which analysed was the following: meteorology, mathematics, statistics, sociology, economics. These disciplines were used more or less individually, which is a good starting point, but to get a proper result from such a complex system, we should go beyond disciplines. To do so, we will use a Knowledge Based System shell, which can help us to understand the complex connection between the different factors. The novelty in our approach would be to get a simple result from a complex, chaotic system by only using machine learning, which is only based on arithmetic and logic. "Lorenz put the weather aside and looked for even simpler ways to produce this complex behaviour. He found one in a system of just three equations. They were nonlinear, meaning that they expressed relationships that were not strictly proportional. Linear relationships can be captured with a straight line on a graph. Linear relationships are easy to think about: the more the merrier. Linear equations are solvable, which makes them suitable for textbooks. Linear systems have an important modular virtue: you can take them apart, and put them together again—the pieces add up. Nonlinear systems generally cannot be solved and cannot be added together. In fluid systems and mechanical systems, the nonlinear terms tend to be the features that people want to leave out when they try to get a good, simple understanding" (Gleick, 2011, p. 29-34). Modern society builds complex infrastructures to ensure the flow of goods and people. This infrastructure became more and more compound, as the people started to use vehicles. The network was always sized for the average usage and due to physical and financial limitations traffic jams and bottlenecks were inevitable.

To monitor these bottlenecks, different solutions were introduced from simple manual observation, to complex traffic management systems. In the beginning only local system were created. Since GSM and GPS technology are spread, these technologies are also used in order to monitor the traffic. This helped the system to automatize the data collection, which made it easier to create a system, where more accurate data is available from each vehicle, compared to the earlier systems, where more or less a gate flow-through was measured. To demonstrate our conception, we would use Hungarian telemetric data. In Hungary currently a GPS and GSM based e-toll system is introduced since 2013, where the vehicles above 3,5 tons have to purchase e-toll ticket based on their road usage. These trucks can buy it by single tickets or by GPS/GSM devices. Around 90% of the trucks are using such a device. We have access of the data of these devices, which data is currently only used for e-toll ticket purchase. In our current research we will use such GPS based data, which is communicated towards the servers via GSM data connection. We will have a 2 second frequent location data about every tracked heavy vehicle. This means, we will have individual route details, where we will break the connection between the routes and the exact trucks, this way pseudonymise the dataset (Kan, Tang, Kwan, Ren, Liu, Li, 2019, p. 229-243). We will focus on the behaviour of the traffic. For the first trial we will gather weather data from the Hungarian Meteorological Service. For the first evaluation we will work with Budapest weather data and take it as the same for entire Hungary, as there could be some differences, but on the average Hungary's weather could be handle homogeneous for the model. Later we will create different geographical clusters for mayor weather collection regions (Nogal, Honfi, 2019, p. 72–83). We will use Machine learning algorithms to create different clusters within the entire data pack, to find correlation between the dataset. For this reason, we would use a KBS shell, which would create the clusters automatically, based on the knowledge base (Quinlan, 1979). We are expecting a strong relation between the speed of the vehicles and the weather conditions. In case if our expectations seem real, we will continue with our research and we will refine the available data into a timeframe of a year, with an hourly aggregation (Theofilatos, 2017, p. 9–21).

## 2. DATA COLLECTION

First of all we have to state that this is only an illustration how could be a new model built up. We will illustrate the approach, how could zona data evaluated. We will set up the basis of a knowledge based system (KBS) as well. We will use this KBS to create different clusters within the data set. We have to state that traffic is a complex system, for this reason it cannot be splitted up into individual factors, each factor depends on the others. We cannot solve it with a linear algebra figure. Furthermore, due to this is not a stochastic process, we cannot give probability of the different factors. It is basically because everything is in relation with everything. We does not tried to find a nonlinear solution for this question because the system is not a deterministic system. This means if there is any nonlinear solution, then it would be a result of long mathematical iterations, which is not our aim currently, because of the holistic approach. In our case, the model is closer to an if-then relation, then to an exact function (Gomes, Gan, Bayen, 2018, p. 160-169). After collecting the GPS data from the trucks, which arrives automatically to our servers from the GPS devices of the trucks, we can mass evaluate it in the KBS shell. Below on the Figure 1 a heatmap projection of the actual average speed on a daily basis, splitted up by the different axle numbers.

*Figure following on the next page*



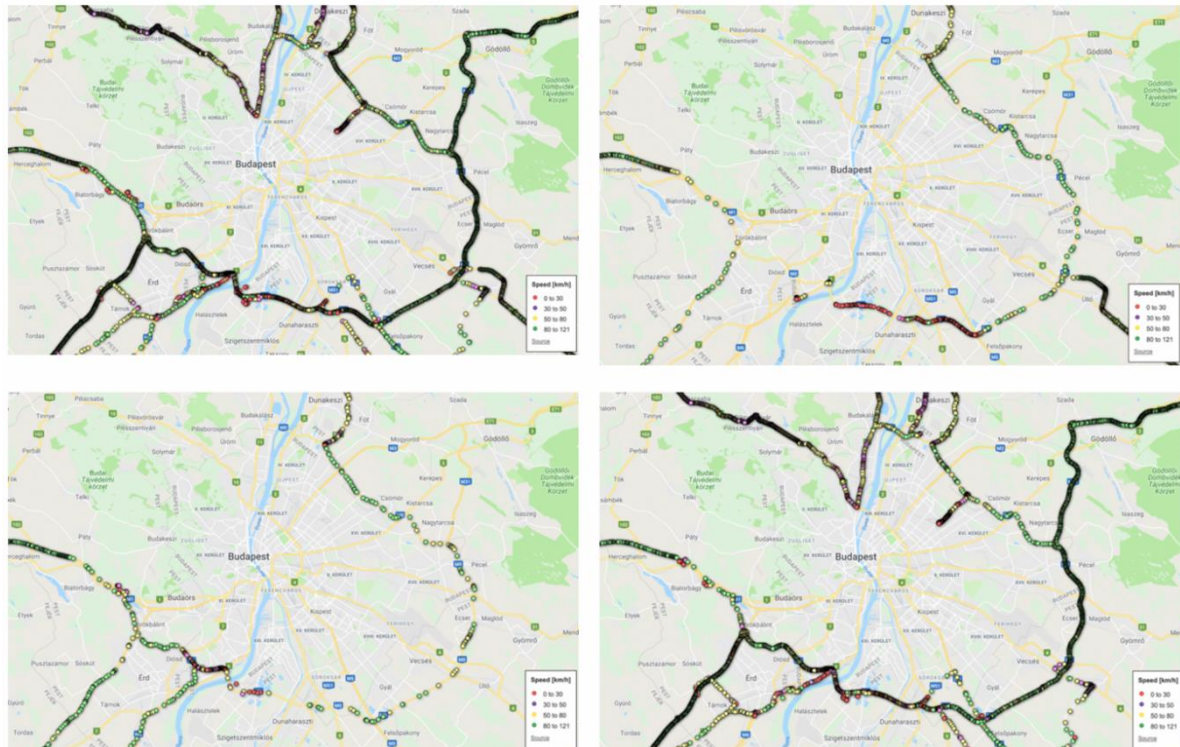


Figure 1: Heatmap of truck's speed in Budapest with different axle settings on 2018.09.03.

(Mikulai, Baracska, 2019)

Top left: all axle type

Top right: 2 axle heatmap

Bottom left: 3 axle heatmap

Bottom right: 4+ axle heatmap

The weather data is collected manually from the Hungarian Meteorological Service in individual data requests, in which we receive an hourly split up of the different data. We will upload these details into our database (Hungarian Meteorological Service, 2018). We will connect the data using the KBS shell, which will make the evaluation as well. During the evaluation 3 or 4 cluster will be automatically generated for each data line and the correlation will be calculated between these figures (Varga, Velencei, 2019, p 72-83). To understand the outcome easier we create different map exports, where the available data is visualised, this can be seen on Figure 1. This helps more the understanding and visualize the bottlenecks of the entire road network. To support the visualisation we are using Google Fusion extension, which can handle big amount of geographical data easily. Different filters could be applied in order to make the visualization easier to understand. These interactive finished maps could be shared, in case of a request (Bowie, G. D., Millward, A. A., Bhagata, N. N., 2014, p. 742-755). As traffic is declared as a complex system, just like the Internet and the social networks, it was widely investigated in the last two decades. Complex system has certain attributes, which is a good starting point of an evaluation. The connection between nodes can be analysed (Jiajing Wu, J., Junwen, Z., Zhenhao, Ch., Chi, K. T., Bokui, Ch., 2018, p. 871-877). Between the nodes different characteristics could be found, which can help to predict further behaviour for example of a road network, which is the basic of traffic (Boccaletti, Latorab, Morenod, Chavezf, Hwang, 2006, p. 241-246).

### 3. CONCEPTUAL MODEL

For the research we will use a Knowledge Based System shell called Doctus, which is built up from two parts, the Knowledge Base and the Shell. The Shell itself is the carrier medium, which

gives a frame for the experts, to build up the knowledge database and leads to a potential found of new knowledge. Creating a KBS has 3 main progress: Knowledge Acquisition, Knowledge Engineering and Application. Acquisition is the part, where the information is gathered. Engineering is the part, where the newly gathered, unstructured data is synthetized and refined. Application is the actual process, when we use the available Knowledge Base, facilitated by Knowledge Engineer (Baracscai, Velencei, Dörfler, 2005, p. 59-66). On Figure 2 a structure for Knowledge Acquisition and Knowledge Engineering can be seen. This model helps us to ensure, that all the relevant data is gathered and evaluated accordingly. There is a logical statement between each connected statements, which is a "if,... than" rule, or production rules. This way Doctus is an evaluating tool which use Symbolic Artificial Intelligence. (Newell, 1982, p. 87-127)

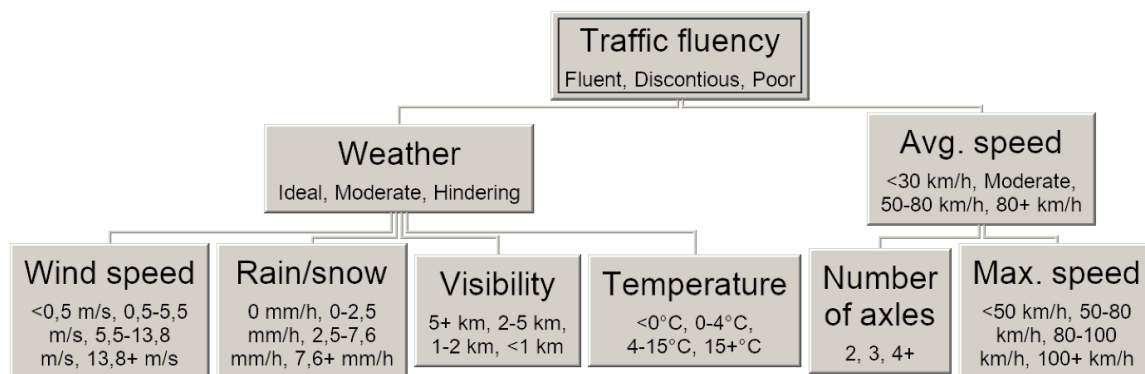


Figure 2: The Rule based graph generated by Doctus (Mikulai, Baracscai, 2019)

Doctus is capable for three mayor type of decision-making process, which are: (1) Original Decision, (2) Routine Decision, (3) Reduction. In case of Original Decision evaluation rules are set up and the decision is made by using these rules. This way is also called Rule-Based Reasoning or deduction. In this case the biggest benefit is that the decision is properly visualized and reasoned, the result would be exactly the same, as the result would be if an expert would make the decision. It helps decision making processes to automatize. In some cases new knowledge could be discovered, by recognizing, that some, earlier stated attributes, important attributes turns out to be irrelevant. The second type is the Routine Decision, when the decision maker can highlight the aspects, but cannot prioritize them. He creates cases, where he can set the outcome of each case and the system recognize the rule of the system. This process is always comes together with knowledge discovery, in a way, that transforming tacit, untouchable knowledge into explicit knowledge. In the last case, in case of Reduction, when the knowledge base is built up from two types, case-based and rule-based knowledge. In this case a constant refinement is in progress, as this model will automatically update the Case-based graph, based on the case-based knowledge base, which updated manually. By using this KBS, we will find the significant connection between weather status, average speed and traffic fluency. After finding the connection, it is easy to find the extreme values, which would be the bottleneck of the system. These values should be avoided, or minimalize, if it is possible. (Velencei, 2019, p. 451-458)

#### 4. CONSLUSION

Sitting in the traffic jam or drive slower is not only a waste of time but burn up enormous amount of recourses. If we could optimise the route planning by the weather, resulting shorter journeys by postponing or bring ahead in time, we can reach a great impact on society, but decreasing the frustration gained by get stucked in the traffic jam, or drive slowly behind a truck on the highway and also economically save enormous amount of gasoline, or petrol by the

smoother routes. According to Gleick we didn't choose a method grounded on linear algebra, but a method, which stands on Artificial Intelligence Based Machine Learning. After our evaluation this approach helps to better understand the traffic fluency. We would get relevant feedback about the behaviour of the participants in the traffic system in Hungary. Our next research would be to implement this model to the entire Hungarian dataset and create further segments. It would be also a good way of research, that we build up an hourly basis model and run the actual evaluation process on the dataset.

## 5. DISCUSSION

In our Transdisciplinary Laboratory for Decision maker behaviour we follow Basarab Nicolescu's (Nicolescu, 2018) approach towards ontological postulate. In this paper we observed reality at personal and society levels. In nowadays society the travelling number of vehicles are exponentially increasing (thesis), which involuntarily takes frustration into people life on a personal level (anti-thesis), due to their inability to do anything against it. With our model we created a synthesis on a personal level of reality, in which people can partially dissolve their frustration and get closer to happiness (Kahneman, 1999, 1-23). A few limitations raised during our research, which should be handled during further research. The first one was the currently we created only one geographical segment, which is a good validity check, but at least 3-4 geographical segments would be required in case of analysing the entire population. Our model does not take into consideration the different road types, whether it is highway, where the allowed speed limit is higher, a national road, or an inhabited area. At last but not least the effect of rush hours should be taken into consideration, as there are certain periods, when truck cannot go faster, due to the heavy traffic.

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## ANALYSIS OF THE INSURANCE INDUSTRY CONCENTRATION AS AN ASSESSMENT MEASURE OF THE SUCCESS OF COMPANY TAKEOVER IN THE REPUBLIC OF CROATIA

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### ABSTRACT

*The objective of the research presented in this master's thesis is to determine the importance of the level of insurance industrial concentration in the Republic of Croatia in terms of being a measure which is directly linked with profitability that comes after company takeover. The objective is also to emphasize the importance of successfully applied external rise strategy that is manifested through operations of takeover in terms of strengthened competitiveness of Croatian insurance industry and also in providing insurance companies with better prospects of achieving long-term goals in a shorter time period. The results regarding the insurance industrial concentration in the Republic of Croatia have emerged after the methodology presented in scientific and professional literature was applied. The research was conducted on the basis of the following scientific methods: analysis, description, classification, comparison, synthesis and concretization. Simultaneously, a comparison analysis was carried out with results with respect to insurance industrial concentration ratios in Bosnia and Herzegovina. On the basis of the result obtained from annual financial reports with respect to the observed time period of ten years, we have come to the conclusion that insurance industry in the Republic of Croatia (where a large number of small or medium-sized enterprises operates) is moderately fragmented. Additionally, we have also concluded that competitiveness between enterprises has been increased. Since it is a case of monopolistic competition, entry and exit from the industry in the long run can be considered to be easy. In short, we talk about industry that is profitable with regards to company takeover. The comparison analysis between the insurance industries in the Republic of Croatia and Bosnia and Herzegovina suggests a better ranking of the mentioned industry in Bosnia and Herzegovina when it comes to the context of profitability of company takeover as opposed to the situation in Croatia where industry leaders take over the dominant industry market shares. This is how they reinforce the possibility of shaping industrial events. In other words, industry structures appears to approximate oligopoly structures. A large number of insurance companies operates in Bosnia and Herzegovina so we talk about a significantly fragmented industry where profitability after company takeover is certain.*

**Keywords:** *concentration, insurance industry, the Republic of Croatia, company takeover, profitability*

### 1. THE INSURANCE MARKET IN THE REPUBLIC OF CROATIA

The insurance market is the totality of relationships between bidders and claimants of insurance, whereby these relationships take place on the basis of free decisions of all the participants. The size and strength of the insurance market in a country can be determined in a number of ways, the most common being the data on the total annual premium in one country, the average premium per capita, the number of market participants and the market potential (which is always higher than the premium).<sup>1</sup>

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<sup>1</sup> Andrijašević, S., Petranović, V. (1999): Economics of Insurance, Alfa, Zagreb, p.169

In the Republic of Croatia, reports are made on the basis of data collected by the Croatian Financial Services Supervisory Agency (HANFA). The statutory regulations related to the insurance sector (Insurance Act and the Act on Compulsory Insurance within the Transport Sector and their amendments, and the Civil Obligations Act) together with other subordinate legislation and ordinances issued by HANFA regulate the behaviour of participants in the Croatian insurance market. This enables the Croatian insurance market to meet the standards of a competitive insurance market, in which all participants are in the same position, without preference for a particular insurer or insured party, namely:

- Homogeneity
- Transparency
- Personal, spatial and temporal preferences of the insured party,
- Deciding based on economic principles

Competition affects risk selection, leading to the process of individualizing the premium, i.e. the process of determining and adapting the average premium rate to each particular risk.

The characteristics of the insurance market in the Republic of Croatia do not differ significantly from other insurance markets in transition countries. These are:

- Variations in the number of insurance companies, where existing companies go through absorptions and mergers
- Growth of the total insurance premium
- Uneven distribution of certain types of insurance in the total insurance premium, the dominant being automobile liability insurance with a share of 23.57% in the total portfolio at the end of 2017
- Growth of motor hull insurance (casco) since the beginning of the recession, mainly due to a rise in the number of cars bought on credit or leasing. Motor vehicle insurance is decreasing in the total insurance premium.
- Sales of life insurance increased despite inflation and declining living standard. The rise in the share of life insurance is a consequence of the fear of uncertainty in old age and is closely related to the pension reform that was carried out at the beginning of 2002. The data showing that the ratio of life and non-life insurance in the Republic of Croatia is 33.3:66.7, while in Europe it is approximately 59.05: 40.95, leads to the conclusion that there is still room for increase in sales of life insurance on the Croatian insurance market.
- Fluctuations in accident insurance and health insurance are the result of changes in legal regulations in social care. The population is under-educated with regards to personal insurance and generally does not distinguish between individual types of insurance. Also, unsteadiness in the legislation regulating health insurance is the cause of the population's confusion concerning the coverage width and the price of social health insurance services, so individuals determine the need for such insurance only when their health is affected. Accident insurance is generally not included in the collective agreements with employees, even when it comes to coverage during working time and arriving at or leaving work.
- The share of insurance of goods in transport is becoming lower in the total insurance premium.
- The insurance company *Croatia osiguranje* is dominant on the market.

### **1.1. The main features of the insurance market in the Republic of Croatia**

Insurance companies are part of the financial system as important financial institutions and institutional investors. In the area of life insurance, they are financial institutions for contractual savings that provide long-term dedicated savings to individuals and companies.



The importance of insurance companies in the financial system is represented by the share of assets of insurance companies in the assets of all financial institutions and the share of insurance in the savings of the population sector, as a sector with excessive financial resources. The following tables show the state of the financial sector in 2017.

*Table 1: Shares of financial intermediaries in the total assets of financial intermediaries at the end of 2017 in absolute amounts in HRK million*

FINANCIAL INTERMEDIARY	ASSETS	SHARE (%)
Commercial banks	391,304	67.37%
Mandatory pension funds	91,925	15.83%
Insurance companies	40,819	7.03%
UCITS investment funds	18,500	3.19%
Leasing companies	18,147	3.12%
Housing savings banks	7,918	1.36%
Voluntary pension funds	4,745	0.82%
Alternative investment funds	3,574	0.62%
Factoring companies	2,614	0.45%
Special act investment funds	789	0.14%
Pension insurance company	498	0.09%

Source: [http://www.huo.hr/Listanje\\_PDF/Kljucne\\_informacije\\_2017/index.html#/8](http://www.huo.hr/Listanje_PDF/Kljucne_informacije_2017/index.html#/8) (August 14, 2018)

Key indicators of insurance in the Republic of Croatia are gross premium written, claims paid, number of insurance contracts, insurance companies' assets, number of employees, etc. Statistical data on the indicators mentioned can be found below. Table 2 shows the key indicators of the Croatian insurance market.

*Table 2: The key indicators of the Croatian insurance market*

DATA	TOTAL	% CHANGE	NON-LIFE	% CHANGE	LIFE	% CHANGE
GROSS PREMIUM WRITTEN	9,055,923,737	+3.4%	6,115,709,596	+4.7%	2,940,214,140	+0.7%
NUMBER OF INSURANCE CONTRACTS	9,920,837	+2.1%	8,427,216	+2.7%	1,493,621	-1.1%
CLAIMS PAID	5,106,300,388	+7.4%	3,052,599,488	+4.3%	2,053,740,900	+12.3%
NUMBER OF CLAIMS PAID	3,408,072	+6.6%	3,345,578	+6.8%	62,494	-1.3%
ASSETS	40,818,480,287	+3.7%	17,821,196,142	+4.8%	22,997,284,125	+2.8%
CAPITAL AND RESERVES	9,565,067,562	+10.0%	6,161,088,636	+9.7%	3,403,978,926	+10.48%
CAPITAL AND RESERVES SHARE IN TOTAL ASSETS	23.4	-	34.6	-	14.8	-
INVESTMENTS	34,925,509,814	+5.5%	12,580,484,310	+5.9%	22,345,025,504	+5.2%
TOTAL RESERVE	28,468,447,988	+3.3%	9,545,450,967	+2.3%	18,922,997,021	+3.8%
PROFIT (BEFORE TAXES)	715,536,144	+5.4%	440,396,341	+21.1%	275,139,803	+11.1%
EMPLOYEES IN INSURANCE COMPANIES	8723	-4.5%	-	-	-	-
-UNDER-WRITING	5588	-2.3%	-	-	-	-
-CLAIMS PAID	767	-0.4%	-	-	-	-

Source: [http://www.huo.hr/Listanje\\_PDF/Kljucne\\_informacije\\_2017/index.html#/6](http://www.huo.hr/Listanje_PDF/Kljucne_informacije_2017/index.html#/6) (August 15, 2018)

In 2017, there was a recorded annual growth of gross written premium of 3.7%, which in absolute numbers amounted to HRK 40.8 million. Life insurance recorded a slight growth of 0.7%, with gross written premium of HRK 2.9 million.

The increase in the total premium in 2017 was again due to the mild growth in the non-life insurance market and the mild growth in life insurance. Assets of insurance companies at the end of 2017 in the Republic of Croatia amounted to HRK 40.8 million. The number of non-life insurance policies at the end of 2017 was 8,427,216 and the number of life insurance policies was 1,493,621. The amount of claims paid by insurance companies amounted to HRK 5.6 billion, with a growth rate of 7.4% compared to 2016. This rate is due to the significant increase of 12.3% in life insurance claims paid, but also claims paid in non-life insurance amounting to 4.3%, which is also a major growth trend in relation to the previous year. Insurance companies had 8,723 employees at the end of 2017, which represents a decline of 4.5% compared to the previous year. The number of employees in recent years shows a negative growth tendency, but regardless of this fact, insurance companies are still an important participant of the financial and economic sector when it comes to the number of employees.

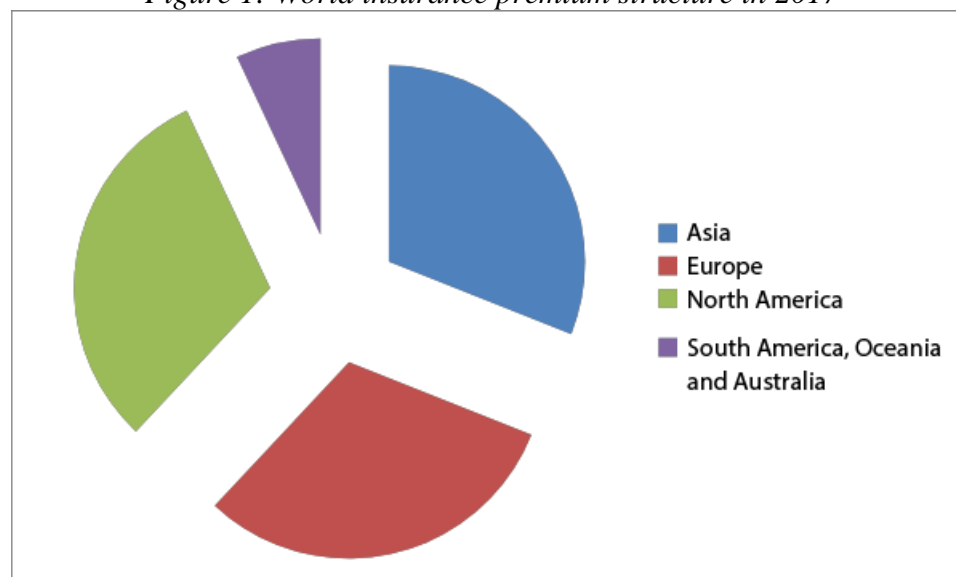
### 1.2. Position of the Croatian insurance industry in the world

International comparability and significance of insurance companies and insurance activities is commonly seen through three key indicators:

- Share of gross premiums written in the gross domestic product or insurance penetration
- Insurance premium per capita or underwriting density
- Share of life insurance premium in total insurance premium

The world insurance premium structure shows that the world's largest insurance market in 2017 was the Asian insurance market, with a share of 31.56% in the total world premium, thereby overtaking Europe's share of 31.06% in 2017. North America's share is 31%, while 6.38% is shared by South America, Oceania and Africa. Figure 1 shows the information mentioned.

*Figure 1: World insurance premium structure in 2017*



Source: [http://www.huo.hr/Listanje\\_PDF/Kljucne\\_informacije\\_2017/index.html#/6](http://www.huo.hr/Listanje_PDF/Kljucne_informacije_2017/index.html#/6) (August 15, 2018)

The share of the Croatian insurance industry in the total world premium in 2017 was 0.03% and the amount of insurance premium puts Croatia in the 66th place in the world. On the other hand, the Croatian insurance market has a share of 0.10% in the European insurance market. It is important to point out that when Croatia joined the European Union, the Croatian insurance market became part of the EU's single financial services market, which is the second largest



world market in the field of insurance.<sup>2</sup> Based on indicators of the importance of insurance companies, the Republic of Croatia is far more developed in this segment than Eastern European countries, but significantly lags behind more developed European countries, as can be seen in Table 3.

*Table 3: Development of Eastern European countries based on indicators of the importance of insurance companies*

COUNTRY	TOTAL PREMIUM IN GDP %	TOTAL PREMIUM PER CAPITA IN USD	LIFE INSURANCE PREMIUM IN TOTAL PREMIUM %
USA	7.3	7,174	41.3
JAPAN	9.5	3,732	75.1
GREAT BRITAIN	10.2	4,064	65.5
GERMANY	6.1	2,548	44.0
<b>CROATIA</b>	<b>2.6</b>	<b>307.2</b>	<b>33.3</b>
SLOVENIA	5.0	1,084	2.3
CZECH REPUBLIC	3.1	591.5	37.7
HUNGARY	2.5	316.7	49.9

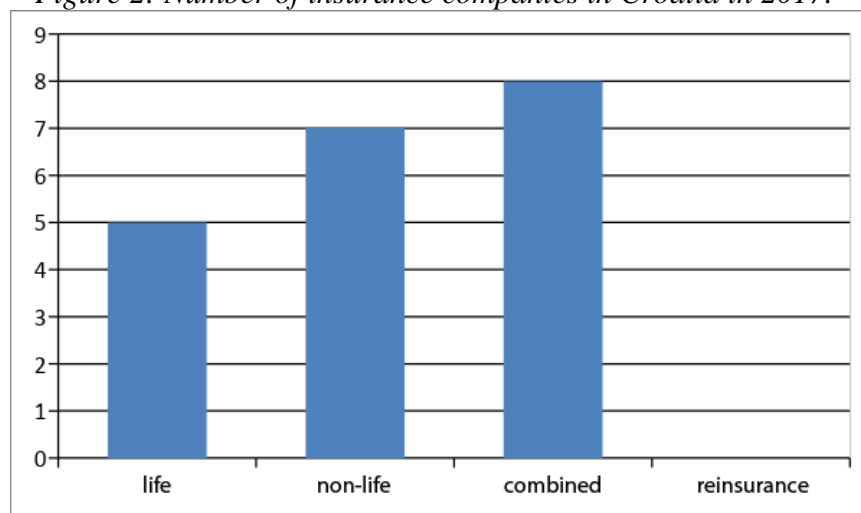
Source: based on <https://www.huo.hr/hrv/statisticka-izvjesca/18/> (August 16, 2018)

The table shows that the indicators for the Republic of Croatia in 2017 were: 2.6 the premium share in GDP, USD 307.2 or HRK 2.091 insurance premium per capita and the life insurance premium share in the total premium of 33.3%. The data points to a significant area for premium growth in the Republic of Croatia, especially if compared to Germany and Great Britain, which have the most developed insurance markets in Europe.

### 1.3. Insurance companies in the Republic of Croatia

At the end of 2017, there were 20 insurance companies based in the Republic of Croatia. Out of the total number of insurance companies, 5 dealt exclusively with life insurance, 7 companies dealt exclusively with non-life insurance, while the remaining 8 insurance companies dealt with both life and non-life insurance.

*Figure 2: Number of insurance companies in Croatia in 2017.*



Source: made by author based on <https://www.huo.hr/hrv/statisticka-izvjesca/18/> (August 20, 2018)

<sup>2</sup><https://www.huo.hr/hrv/statisticka-izvjesca/18/> (August 15, 2018)

The number of insurance companies in the Republic of Croatia has a tendency of decline, which is a direct consequence of market consolidation through insurance company takeovers.

Croatian insurance companies are takeover targets due to<sup>3</sup>:

- Human resources quality
- Market share they hold in Croatia and abroad (Southeast and Central Europe)
- Desirability for fast entry on the Croatian market
- Expected business and financial synergies (greater economy of scope, lower labour costs, positive cash flow, etc.)

Three leading insurance companies in the Republic of Croatia, i.e. market leaders that make up the majority of the market share are analysed below. The first place is held by Croatia osiguranje d.d., followed by Allianz Zagreb d.d. and Euroherc osiguranje d.d.. An important factor for managerial decision-making is the size of the company. However, its measurement depends on the purpose of the analysis. Enterprise size can thus be measured by using different categories such as number of employees, added value, realized profit or sales revenue. Equal opportunities for growth are not offered by all industries. Under the conditions of a global economy, certain activities are more efficient for use within large corporations. In such a way, financial institutions, including insurance companies, increase their size and scope of activities in the desire to realize the economy of scope and scale. The first step in the analysis will be the ownership structure of leading Croatian insurance companies, expressed in %.

*Table 4: Ownership structure of three leading Croatian insurance companies, expressed in %*

Table A: Ownership structure of three leading Croatian insurance companies, expressed in %					
CROATIA OSIGURANJE d.d.	ALLIANZ OSIGURANJE d.d.			EUROHERC OSIGURANJE d.d.	
OWNERSHIP STRUCTURE IN %					
The Republic of Croatia ( State Administrative Office for State Property Management)	30.62	Legal entities based in the Republic of Croatia (Zagrebačka banka d.d.)	16.83	Legal entities based in the Republic of Croatia	2.65
ADRIAS GRUPA d.d.	61.30	Legal entities based in other countries	83.16	Physical persons resident in the Republic of Croatia	1.03
Small shareholders	8.08			Physical persons resident in other countries	65.32

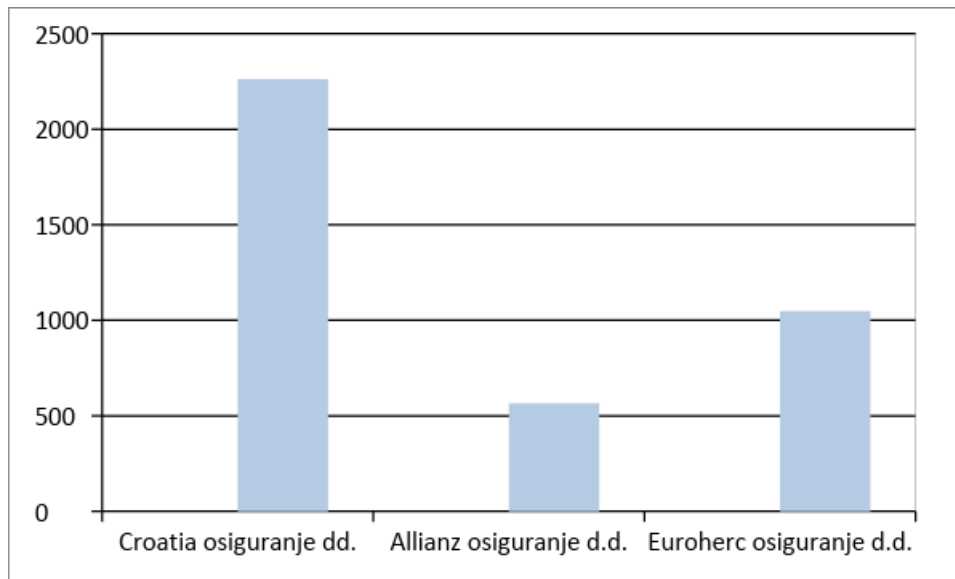
*Made by author based on <https://www.huo.hr/hrv/publikacije-i-statistika/4/> (September 8, 2018)*

Based on the data in Table 4, it is clear that the structure of the ownership of leading insurance companies is made up of domestic insurers, and that it is mainly privately owned, while the share of state ownership is small. The next analysis is based on the number of employees in leading insurance companies in the Republic of Croatia in 2017.

*Figure following on the next page*

<sup>3</sup> A. Bertonec: Acquisitions, Narodne novine, Zagreb, p.33

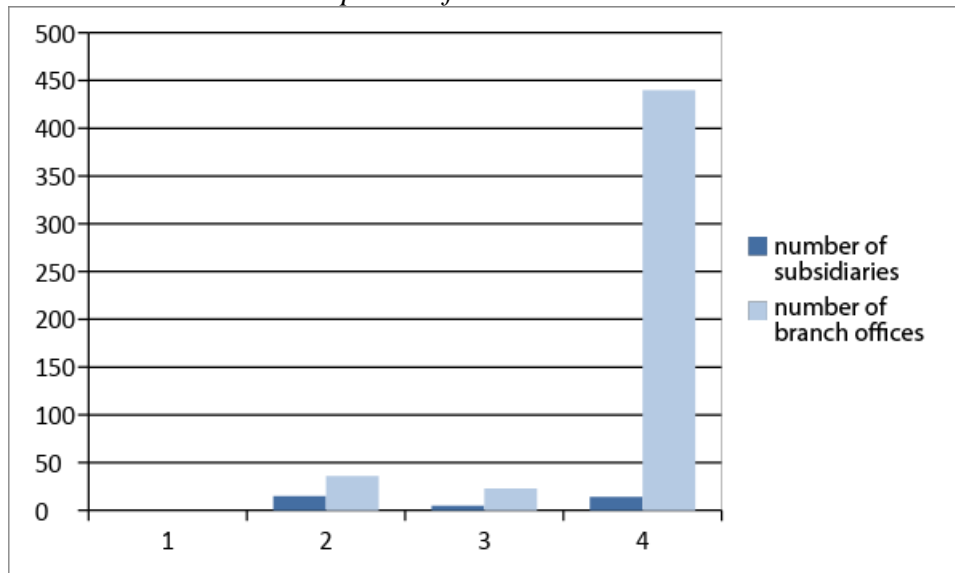
*Figure 3: Number of employees in leading insurance companies in the Republic of Croatia in 2017*



*Source: made by author based on <https://www.huo.hr/hrv/publikacije-i-statistika/4/> (September 8, 2019)*

As expected, Croatia osiguranje d.d. as the market leader also holds the leading position regarding number of employees, with a relative number of 2,262 employees. The second position is held by Euroherc osiguranje d.d. with 1,047 employees, followed by Allianz osiguranje d.d. with 565 employees. Another important point is the analysis of the number of subsidiaries and branch offices of leading insurance companies in the Republic of Croatia.

*Figure 4: Number of subsidiaries and branch offices of leading insurance companies in the Republic of Croatia in 2017*



*Source: made by author based on <https://www.huo.hr/hrv/publikacije-i-statistika/4/> (September 8, 2018)*

The dominant insurance company regarding the number of branch offices is Euroherc osiguranje d.d., while the number of branch offices of Croatia osiguranje d.d. and Allianz osiguranje d.d. is absolutely insignificant.

Croatia osiguranje d.d. and Euroherc osiguranje d.d. have almost the same number of subsidiaries, while the number of Allianz osiguranje d.d. subsidiaries is rather small. The importance of the number of subsidiaries and branch office is inevitable precisely because they have the role of distribution channels due to which the company's business gets a wider territorial coverage. The leading insurance company, Croatia osiguranje d.d., has the largest network of stations for technical inspection of vehicles. Through distribution channels, synergies with the parent company are realized, which makes an excellent predisposition for further growth. The analysis of gross written premium in HRK million in 2017 and the growth rate in relation to the previous year can be seen in Table 5.

*Table 5: Gross written premium and growth rate of leading Croatian insurance companies in 2017*

INSURANCE COMPANY	GROSS WRITTEN PREMIUM( in HRK million)	GROWTH RATE
Croatia osiguranje d.d.	2.618.00	+349.4
Allianz osiguranje d.d.	1,146,1	+30.0
Euroherc osiguranje d.d.	915,2	+72.7

*Source: made by author based on <https://www.huo.hr/hrv/publikacije-i-statistika/4/> (September 8, 2017)*

Table 5 shows the dominant position of the insurance company Croatia osiguranje d.d. based on the data on the gross premium written in HRK million, but also a growth rate of 349.4% compared to 2016. Allianz osiguranje d.d. and Euroherc osiguranje d.d. also achieved growth, but Euroherc osiguranje d.d. achieved a growth rate twice as high as Allianz and is becoming its most dangerous competitor. Croatia osiguranje d.d. owes this high rate of growth to takeovers of insurance companies in the Republic of Croatia, but also in the neighbouring Bosnia and Herzegovina, where it is also becoming the market leader in the insurance industry. Euroherc osiguranje d.d. has spread its business operations from Croatian and Bosnia and Herzegovina to the Austrian market by means of company takeovers. Based on previous analyses of leading companies in the insurance industry in Croatia, the dominant influence of the same on the rest of the industry is evident, as well as the successful implementation of strategies that strengthen their position. Number of employees, number of branches and subsidiaries, growth rate and gross premium written of these companies confirm their integrity and stability.

## **2. ANALYSIS OF INSURANCE MARKET CONCENTRATION IN THE REPUBLIC OF CROATIA AND COMPARATIVE ANALYSIS WITH BOSNIA AND HERZEGOVINA**

### **2.1. Basic market structures**

Market structure is defined as a competitive environment in which buyers and sellers of products and services operate. Market structure seeks to explain the magnitude of buying and selling power on different types of markets and their different behaviours with regard to differences in the amount of their power. It is possible to identify many types of markets with specific features. They are categorized into several different types or models with clearly defined characteristics. Characteristics that differentiate individual markets are primarily: number of vendors, number of consumers, degree of similarity between products and services of different manufacturers and vendors, availability of information on costs and prices, market entry and exit barriers. There are four market structures that can be recognized<sup>4</sup>.

<sup>4</sup> Salvatore, D.(1994): Economics for Managers in World Economy, 2nd edition, Mate, Zagreb, p. 368

Perfect competition at one end, pure monopoly on the other, and between them monopolistic competition and oligopoly. Perfect competition in its pure form has never really existed, but the basic principles of the model can be applied to real-world markets that consist of many sellers and buyers. In the market of perfect competition, there is a large number of buyers and sellers of products and services, and each seller and buyer is too small in relation to the market to affect the price of the products through their actions. Accordingly, the change in production volume in only one company would not significantly affect the market price of the product or service. Also, each buyer is too small to be able to get benefits from a seller such as quantity discount and special lending terms. The product or service of any competing company is homogeneous, identical or completely standardized, which means that buyers cannot differentiate between the products and services of different companies and it is completely the same to them from which company they will buy the product or service they want. The perfect mobility of production factors would in other words mean that employees and other inputs could geographically easily move from one job to another and react relatively quickly to cash incentives. In the long run, companies could enter the industry or leave without major difficulties. Finally, in a market of perfect competition consumers, asset owners and companies in the market would be perfectly informed of current and future prices, costs and economic opportunities in general. This model helps to evaluate and compare the efficiency of the use of funds in various forms of market organization. Imperfect competition is a feature of markets in which there is one or more companies that can form prices and affect the amount offered. If there is a possibility of regulating the price of a product or service, if entering and leaving the market is difficult for other companies or the product offer is not homogeneous and the company in question has some of the characteristics mentioned above, it will lead to the development of imperfect competition. Examples of imperfect competition are: monopoly, oligopoly and monopolistic competition. Monopoly is the other extreme form of market organization. It is defined as the form of market organization in which only one company sells a product or service that does not have close substitutes and which is closed for other companies wishing to enter it (for legal or technical reasons), i.e. entry for competitors is difficult or even impossible. The seller is in a dominant position, while the buyer is obliged to accept the conditions imposed on him by the monopolist. Unlike companies in perfect competition, a monopolist can profit in the long run, because industry entry is practically closed, with the price being determined when the level of output that maximizes profit is established. To maximize profits, the monopolist applies a three-degree price discrimination policy. The policy of price discrimination is necessary because the monopolist is limited by the demand curve, which means it cannot use any price and can earn as much as the demand allows. There are two forms of monopoly: legal monopoly and natural monopoly. A legal monopoly is created when some legal regulation (patent, license, customs, etc.) establishes a barrier to freedom of entry into the business, and the existing manufacturer (seller) has an ensured monopolistic position.<sup>5</sup> A natural monopoly emerges in certain industries as a result of economy of scope, i.e. the long-term average cost curve may fall for a large range of products until only one company supplying the entire market remains. In addition to regular monopolies, cases of pure monopoly were very rare in the past, and are now prohibited by law. Regardless, the model of pure monopoly is often useful in explaining established business behaviour in cases that are close to pure monopoly. The model also gives insight into the action of other types of imperfect competitive markets (monopolistic competition and oligopoly). The monopolist does not have unlimited power on the market. The most common regulatory methods used by governments to control large corporations are: Regulating the return rate on invested capital and Regulating the maximum price that the manufacturer can impose on the consumer. Oligopoly is one of the forms of imperfect competition in which only a few sellers participate, usually from 3 to 15 of them.

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<sup>5</sup> Babić, M., (2000): Microeconomic Analysis, Mate, Zagreb, p.291

The market structure which we call oligopoly is characterized by the existence of more than one or less than "many" producers (companies).<sup>6</sup> Depending on whether a homogeneous or differentiated product or service is sold, we can distinguish between a pure oligopoly or a differentiated oligopoly. Entry into a oligopolistic industry is possible, but not easy. Competition exists within this market structure, but since price competition can lead to devastating price wars, oligopolists usually prefer to compete with non-price competition (based on product differences, service quality, etc.). Rivalry or interdependence between companies in a particular industry is a specific feature of oligopoly. This is the natural consequence of a small number of enterprises. Oligopoly models are the following: a kinked demand curve model, non-price competition and game theory model, cartel model and price leadership model. Each of the aforementioned models focuses on a particular form of oligopolistic interdependence, but neglects the others. This is the reason for their limited applicability and for being somewhat unrealistic. Monopolistic competition is a form of market organization where there are many sellers of a differentiated product and where, in the long run, entry into and exit from the industry is quite easy. Similarity with perfect competition is found in the large number of sellers and buyers, while monopolistic power is sharply restricted by the availability of a large number of close substitutes. The curve of market supply and demand cannot be derived due to product differentiation, leading to price clustering. A monopolistically competitive company can change variables such as: product uniqueness, sales costs and prices. Monopolistic competition is the most common market structure in modern economics, and is most common in the retail sector.

## **2.2. Measuring market concentration**

In the long run, higher or lower profitability as a characteristic of a company's competitiveness is not only a result of development and implementation of strategic activities, but also depends on the industry structure, i.e. the competitive space in which companies compete. Industry structure is characterized by the number of companies in the industry at a given time, but also the size of these companies, while degree of industrial concentration is used as a measure of industry structure.<sup>7</sup> Scientists apply different concentration measures trying to describe industry structure. Information on industrial concentration suggests the degree and nature of competitive forces in any industry. The most commonly used concentration measures are concentration ratios and the Herfindahl-Hirschman Index. Some other measures are the Tideman-Hall Index, Rosenbluth Index, Comprehensive Concentration Index, entropy index, Gini coefficient.

### *2.2.1. Concentration ratio*

Concentration ratio measures the market share of N largest companies in an industry, with N usually being 3, 4 or 8 companies. Market share is usually measured through the value of sales revenue, asset value or the number of employees. Concentration ratios are an incomplete measure of industrial concentration as they show how much out of the total industry output was produced by N largest companies in the industry. The disadvantages of these indicators include the frequent impossibility of a precise industry definition, the inability to incorporate input and output barriers, as well as foreign and regional competition, and do not take into account the distribution of market shares of other companies. Due to lack of concentration ratios, some scientists use the summation measures of concentration, taking into account all companies in the industry.<sup>8</sup>

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<sup>6</sup> Santini, I., (2004): Microeconomics, HBIS, Zagreb, p.210

<sup>7</sup> Lipcynski, J., Wilson, J. (2001): Industrial Organization: An Analysis of Competitive Markets, Harlow Essex Pearson Education Limited, p.104

<sup>8</sup> DePhampilis, D.M. (2010): Mergers, Acquisitions, and Other Restructuring Activities, 5<sup>th</sup> ed, Academic Press, San Diego, p. 62

According to the formula, it represents the percentage of market output concentrated in the R number of the largest companies in a particular industry. It is expressed by the formula:

$$CR_r = s_1 + s_2 + \dots s_r = \sum_{i=1}^r s_i \quad (1)$$

In formula (1), r denotes the number of large companies for which the concentration ratio is calculated, and Si denotes the market share of the company. The concentration ratio is a very simple measure. CR<sub>4</sub> and CR<sub>8</sub> concentration ratios are the most commonly used and show the share of the top 4 or top 8 largest companies in the total industry. CR<sub>4</sub> is most commonly used in the form of a concentration ratio showing the share of the four largest companies in the industry.

$$CR_4 = \sum_{i=1}^4 s_i \quad (2)$$

The ratio in formula (2) highlights the importance of the four largest companies in the industry, while neglecting the impact of smaller companies in the market. By calculating this index, it is possible to determine the form of market structure, whether it is a competitive or non-competitive industry. The concentration ratio of four companies in the industry is generally between 20 and 80 percent. An industry in which the concentration ratio of four companies is close to 100 is obviously oligopolistic. Industries where this ratio is higher than 50, up to 60 percent are probably also oligopolistic.

#### 2.2.2. The Herfindahl-Hirschman Index

The Herfindahl-Hirschman Concentration Index (HHI) is another way to measure a particular industry structure. It shows not only the distribution of market shares of N leading companies in the industry, but also the market shares of other companies. It is calculated using the following formula:

$$H = \sum_{i=1}^m x_i^2 \quad (3)$$

whereby: H- Herfindahl-Hirschman Index, x<sub>i</sub> – company share and m- number of companies in the industry.

The HHI index, with the aim of calculating the statistical measure of concentration, squares the market share of all companies in the relevant market, giving greater importance to the shares of leading companies and thus reflecting more precisely the relative importance of large companies in the event of mergers or acquisitions. This index can have values from 0 to 10.000 (100<sup>2</sup>). If the index tends to show lower values, then the industry has a large number of companies with a very small market share (a fragmented industry), and if the index is equal to 10,000 then the industry consists of only one company- a monopolist.<sup>9</sup>

<sup>9</sup> Tipurić, D., Pejić Bach, M., Pavić, T. (2008): Concentration of the insurance industry in selected transition countries of Central and Eastern Europe, 1998-2006, Vol.20, Issue 1, p.97

The HHI gained importance in practice since 1982 when the US Department of Justice issued new guidelines for assessing corporate merger requirements based on this index.<sup>10</sup> The US Federal Trade Commission (FTC) is an independent agency established to protect consumers and prevent and eliminate what the regulators believe is creating harmful anti-competitive business practices. When the value of the HHI index reported by the FTC is lower than 1,000, the market is not concentrated, while index values between 1,000 and 1,800 reflect a moderate concentration. Index values over 1,800 suggest a concentrated market.<sup>11</sup> Table 6 shows the degree of market concentration according to the FTC.

*Table 6: Degree of market concentration*

<b>HHI value</b>	<b>HHI&lt;1,000</b>	<b>The market is not concentrated.</b>
	<b>1,000&lt;HHI&lt;1,800</b>	<b>The market is moderately concentrated.</b>
	<b>HHI&gt;1,800</b>	<b>The market is concentrated.</b>

*Source: made by author based on DePamphilis, D.M. (2010) Mergers, Acquisitions and Other Restructuring Activities, 5<sup>th</sup> ed., Academic Press, San Diego, p. 63*

Industry structure can range from highly fragmented to tightly consolidated industry. Fragmented industry is a form of industry with low concentration and a large number of small and medium-sized enterprises, none of which dominates the industry, nor has the power to shape industrial events.<sup>12</sup> Consolidated industry is a form of a concentrated industry dominated by one or few large companies. The main feature of this industrial structure is the interdependence of companies, which is reflected in the fact that business moves of one company affect other companies' profitability, as well as their market share. The more concentrated the industry, at least according to some research, the more likely it is that companies in that industry will recognize their mutual dependence and will not encourage a strong rivalry that can reduce profitability for everyone.<sup>13</sup> In Keating's study in 1991 on a sample of 2,438 large companies in the period from 1969 to 1981, it was concluded that the profitability of enterprises in concentrated industries is less stable than the profitability of enterprises in fragmented industries.<sup>14</sup>

### **2.3. Analysis of insurance market concentration in the Republic of Croatia as a measure of the success of company takeovers in the industry**

The impact of industrial concentration on the success of company takeover has been empirically confirmed in the Republic of Croatia. The results of the survey conducted on a sample of 43 Croatian companies suggest that the link between industrial concentration and business after takeover is significant in practice because all companies that do business in a highly fragmented industry became more successful after takeovers.<sup>15</sup> After a takeover, many changes take place in the target company which affect its business, so it can be concluded that changes in the industry that is characterized by lower concentration will have a greater impact on the company's business than in a situation where the industry is concentrated.

<sup>10</sup> Salvatore, D. (1994): op.cit. p.417

<sup>11</sup> DePamphilis, D.M. (2010): op.cit.p. 63

<sup>12</sup> Porter, M.E. (1980): Competitive Strategy: Techniques for Analyzing Industries and Competitors, The Free Press, New York, p. 196

<sup>13</sup> Tipurić, D. (2007): Porter's industry structure model: industry analysis as a key assumption of enterprise strategy formation, Ekonomski fakultet Zagreb, p.2

<sup>14</sup> Keating, B. (1991) An update on industries ranked by average rates of return, Applied Economocis, Vol.23, No.5, p.897

<sup>15</sup> Filipović, D. (2011): Modeling Exogenous and Endogenous Organization Variables for Successful Enterprise Takeover. Doctoral thesis, Ekonomski fakultet Zagreb, p.232



### 2.3.1. Concentration ratio

From 2007 to 2017 on the basis of annual reports on the insurance market in Croatia by the Croatian Insurance Bureau, concentration ratios have been calculated that express the gross premium charged by insurance companies in HRK million, i.e. their market share. Concentration ratios for the first 3, 8 and 12 insurance companies in the industry over the observed period will be calculated and the trend of growth or decline will be explained.

*Table 7: Concentration ratios in Croatia from 2007 to 2017*

Concentration measure	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>CR<sub>3</sub></b>	56.93	56.63	53.81	52.85	52.69	52.81	52.60	51.04	49.49	48.26	51.67
<b>CR<sub>8</sub></b>	82.96	80.66	80.03	78.74	77.71	78.95	78.39	80.82	79.47	77.91	81.79
<b>CR<sub>12</sub></b>	93.28	90.84	90.97	90.03	87.52	90.63	90.63	92.78	92.22	92.02	94.96

*Source: made by author based on <https://www.huo.hr/hrv/publikacije-i-statistika/4/>*

Based on the obtained concentration ratios, the trend of constant decline in value can be observed in the period selected. CR<sub>3</sub> in this survey is made up of three leading market leaders in the insurance industry, which continuously maintain the largest market share of the total number of insurance companies. The three leading insurance companies are: Croatia osiguranje d.d., Allianz Zagreb d.d. i Euroherc osiguranje d.d. Although their market share is significant in relation to other companies, it is decreasing. It decreased by almost 8.67% in the period between 2007 and 2016, only to increase again in 2017 due to a drop in the number of insurance companies, i.e. market consolidation. CR<sub>8</sub> i CR<sub>12</sub> are the most commonly used concentration coefficients that show the share of the top 4 or the top 12 insurance companies with the largest market share. Since concentration ranges exceed 50%, these are moderate concentration markets. Reduction in concentration ratio means that the insurance market is situated between low and moderate concentration. The reduction of these measures also points to the strengthening of competition between insurance companies, while only in 2017 there is a re-weakening of competition between companies due to the increase in the coefficient value. From the above mentioned measures of insurance company concentration (Table 7) it can be concluded that the insurance market is closest to an oligopoly market structure, but by the number of companies it belongs to monopolistic competition, as oligopoly is an industry with 3 to 15 companies, although the industry is slowly approaching oligopoly when it comes to the number of insurance companies (whose number at the end of 2017 was 20).

### 2.3.2. Herfindahl - Hirschman Index

Since concentration ratios must be used and interpreted with great caution as they can greatly overestimate the market power of the largest companies, the Herfindahl-Hirschman index should also be calculated. Unlike with the concentration ratio, in this index market shares of all companies in the industry are calculated. Table 8 shows the results obtained.

*Table 8: Herfindahl - Hirschman Index in Croatia between 2007 and 2017*

Concentration measure	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>HHI</b>	1,598.23	1,435.32	1,457.5	1,267.97	1,354.16	1,351.74	1,309.70	1,246.6	1,210.70	1,207.00	1,335.72

*Source: made by author based on <https://www.huo.hr/hrv/publikacije-i-statistika/4/>*

As the results in Table 8 indicate, there is a clear trend of decrease every year in the observed period to 2016, but in 2017 there is an increase of 128.72. According to HHI, the insurance market in the Republic of Croatia is a moderately concentrated market, which by 2017 moved towards a weakly concentrated market, after which concentration increased and competition

between companies grew as HHI is between the lower and upper limits of concentration, i.e. 1,000 and 1800. Based on concentration measures, it can be concluded that the Croatian insurance market is a fragmented industry in which a large number of small and medium-sized companies operate. The market leader, Croatia osiguranje d.d., has a market share of 28.9 in 2017, which has increased in relation to the previous year, which is why the concentration for 2017 has increased and this insurance company is considered a dominant company, thus having the power to shape industrial events. In such moderately fragmented industries, successful business operating is expected after the takeover of a company, because based on market concentration conclusions can be made on its profitability. It is important to point out that the market structure in which Croatian insurance companies operate is a monopolistic competition, which means that entry and exit from the industry in the long run is easy.

#### **2.4. Comparative analysis of market concentration with Bosnia and Herzegovina**

The insurance market in Bosnia and Herzegovina still has sufficient room for development due to the complex political situation in the country, among other issues the two entities: the Federation of Bosnia and Herzegovina and the Republic of Srpska. There is a relatively high number of insurance companies registered, thus the market is not concentrated and there is great competition between the companies. The new Act on Insurance in the Federation of Bosnia and Herzegovina entered into force in 2016, and in the Republic of Croatia a new Insurance and Reinsurance Assurance Act and the Act on Amendments to the Insurance Companies Act have been adopted. Pursuant to the commitments undertaken in the process of accession to full membership, activities related to the harmonization of laws and other regulations in both entities continue to be pursued. There are certain trends in the insurance market in Bosnia and Herzegovina that will certainly leave a significant mark on the entire market. Some trends are easy to perceive, while some are elusive even for experienced observers. Company takeover is a trend that follows a constant growth rate, for example, the Austrian VIG (Vienna Insurance Group) increased its influence throughout BiH by acquiring Merkur osiguranje BiH, although this group has long been active in Bosnia and Herzegovina indirectly. However, the trend that is much harder to spot than the trend of takeovers is an increase in certain types of insurance, such as loan securing, and the growth of this type of insurance has already started to reflect both on the market and on its clients. According to NADOS (BIH Insurance Supervisory Agency) data, HRK 3.2 million in premiums was collected in January of the current year, which is 181.5% more than in January of the previous year. This is a large growth rate, which is caused by the slow disappearance of guarantors from the banking system of BiH, where banks increasingly take insurance policies as collateral for loans. If they fail to collect any receivables or loans, banks activate the insurance policy and charge their claims from the insurance company. It is much more difficult for insurance companies to deal legally with banks than with physical persons, so banks are regularly paid their claims. The insurance market in Bosnia and Herzegovina is consolidating in terms of ownership and will be further analysed on the basis of the statistical data of the BIH Insurance Supervisory Agency to analyse the concentration ratios and the HHI index as market concentration measures. The first important point in the analysis was to select five market leaders in the insurance industry in Bosnia and Herzegovina. This group consists of the following five companies: Uniqua osiguranje d.d., Euroherc osiguranje d.d., Sarajevo osiguranje d.d., Bosna-Sunce osiguranje d.d., Croatia osiguranje d.d. The above-mentioned insurance companies will be included in the calculation of the concentration ratios in the observed period from 2007 to 2017, namely the last ten years.

*Table following on the next page*

*Table 9: Concentration ratios in BiH from 2007 to 2017*

Concentration measure	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
CR5	45.97	44.79	49.44	46.01	46.00	45.27	46.23	44.76	43.16	41.35	39.21

Source: made by author based on <http://www.azobih.gov.ba/cms/dokumenti/publikacija-hr-17.pdf> (September 8, 2018)

Based on the data obtained in Table 9, i.e. on the basis of concentration ratios, the trend of constant decline in value in the observed six-year period can be clearly observed. CR<sub>5</sub> is the concentration coefficient of five insurance companies with the highest market share. Since the coefficients do not exceed 50%, this is a low concentration market, with a tendency for moderate concentration. Decreasing measures also point to growing competition between insurance companies. The above-mentioned concentration measures of insurance companies lead to the conclusion that the market structure which the insurance market of Bosnia and Herzegovina belongs to is a monopolistic competition, also in terms of the number of insurance companies. Further analysis is based on the Herfindahl-Hirschman Index. Table 10 shows the market shares of all companies in the industry.

*Table 10: Herfindahl-Hirschman Index in Bosnia and Herzegovina from 2007 to 2017*

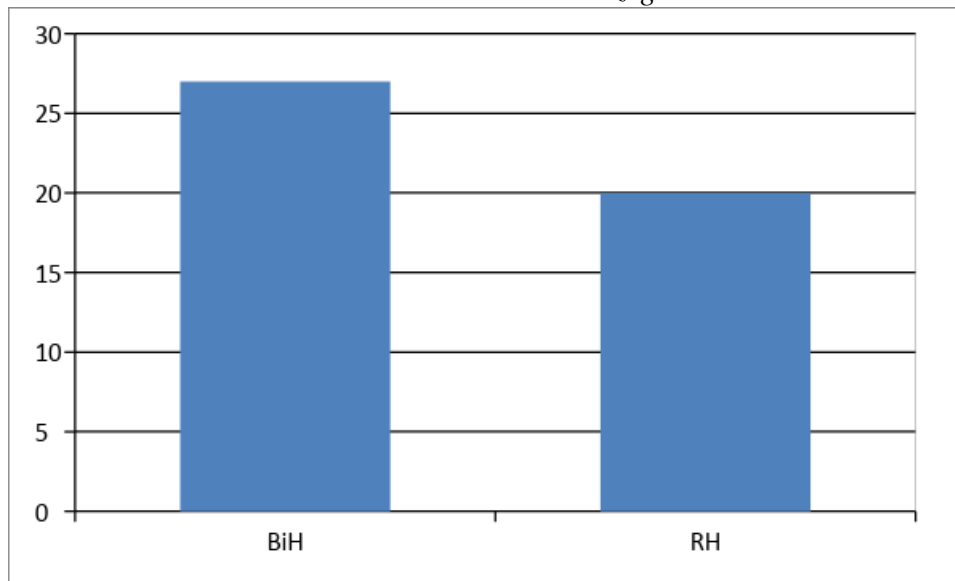
Concentration measure	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
HHI	656	624	711	643	1.817	1.790	1.834	1.796	1.723	1.679	1.609

Source: made by author based on <http://www.azobih.gov.ba/cms/dokumenti/publikacija-hr-17.pdf> (September 8, 2018)

Table 10 clearly shows the trend of increasing the HHI coefficient in the observed period from 2007 to 2017. This trend suggests that the insurance market in Bosnia and Herzegovina was heavily concentrated at the beginning of 2007 and by 2017 it had a tendency for moderate concentration with mild oscillations, while the competition between companies grew as HHI is between the lower and upper limits of concentration, i.e. 1,000 and 1,800. The insurance industry in Bosnia and Herzegovina is a fragmented industry with a large number of small and medium-sized enterprises, none of which is dominant, which implies that no company has the power to shape industrial events. In accordance with the information above, the insurance market in Bosnia and Herzegovina is slowly developing and has a tendency for becoming a moderately fragmented industry, which is directly related to market consolidation or to a decreasing number of small insurance companies being taken over by larger insurance companies. Parallely, market competition is becoming increasingly harsh because more and more influential clients, such as banks, are entering the market. In the long run, entry into the insurance market in Bosnia and Herzegovina is still quite easy, as well as exiting. Given the degree of fragmentation of the industry, profitability in the industry after takeover is promising, and the possibility of making profit is stable precisely because the interdependence of companies isn't prominent. The following comparative analysis will compare potential profitability after company takeover on the basis of concentration measures in two insurance industries. The starting point is the comparative analysis of the number of insurance companies in the Republic of Croatia and Bosnia and Herzegovina.

*Figure following on the next page*

*Figure 5: Comparative analysis of the number of insurance companies in the Republic of Croatia and Bosnia and Herzegovina*



*Source: made by author based on statistical reports by HUO and AZOBiH*

Based on the number of insurance companies, it is evident that Bosnia and Herzegovina has a market structure of monopolistic competition, while the Republic of Croatia has a market structure approaching oligopolistic. Based on market structures, it is apparent that entry into the insurance market in the Republic of Croatia is difficult because there is an interdependence of companies, while entering the insurance market in Bosnia and Herzegovina is simpler due to the large number of small and medium-sized enterprises. A comparative analysis of the concentration ratios in the Republic of Croatia and Bosnia and Herzegovina is presented in Table 11 in the observation period of 10 years, from 2007 to 2017.

*Table 11: A comparative analysis of the concentration ratios in the Republic of Croatia and Bosnia and Herzegovina from 2007 to 2017*

Concentration measure	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
BiH CR <sub>5</sub>	45.97	44.79	49.44	46.01	46.00	45.27	46.23	44.76	43.16	41.35	39.21
Croatia CR <sub>3</sub>	56.93	56.63	53.81	52.85	52.69	52.81	52.60	51.04	49.49	48.26	51.67

*Source: made by author based on statistical reports by HUO and AZOBiH*

Concentration ratios of the Republic of Croatia and Bosnia and Herzegovina in the observed period show that the three market leaders in the Republic of Croatia held a 51.67% market share at the end of 2017, while in Bosnia and Herzegovina five leading market leaders held only 39.21% market share at the end of the same year. Based on the comparative analysis it can be concluded that the insurance market in the Republic of Croatia is an oligopolistic market structure, while the insurance market in Bosnia and Herzegovina has features of monopolistic competition. There is no interdependence of insurance companies, competition is strong and therefore it is easier to enter the insurance market in Bosnia and Herzegovina. For a more accurate comparative analysis of the insurance market in the Republic of Croatia and Bosnia and Herzegovina, the Herfindahl-Hirschman index will be used.

*Table following on the next page*

*Table 12: Comparative analysis of HHI in the Republic of Croatia and Bosnia and Herzegovina in the period 2007-2017*

country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
BiH	656	624	711	643	1,817	1,790	1,834	1,796	1,723	1,679	1,609
Croatia	1,598.23	1,435.32	1,457.5	1,267.97	1,354.16	1,351.74	1,309.70	1,246.6	1,210.70	1,207.00	1,335.72

*Source: made by author based on statistical reports by HUO and AZOBiH*

Based on the results presented in Table 12, the trend of decline in the observed period of time in the Republic of Croatia is clearly noticeable, only in the last year there was re-growth. In Bosnia and Herzegovina, the growth trend of the HHI index has been observed over the years. Both countries have fragmented markets, market structures are what differentiates them and thus the ability to enter the market. Given the number of companies in Bosnia and Herzegovina, it is easier to take over a company because it is a small or medium-sized enterprise, resulting in more stable and safer profitability after the takeover. In both countries, competition between companies is growing as HHI is between the lower and upper limits of concentration, i.e. 1,000 and 1,800. The dominant company with the power to shape industrial events in the Republic of Croatia is Croatia osiguranje d.d., which aims to increase market share and become a market leader through takeovers in Bosnia and Herzegovina, with strong potential for further growth in the neighbouring market.

### 3. CONCLUSION

The insurance market in the Republic of Croatia is still far behind developed insurance markets such as the United Kingdom, Germany or France, but in comparison with the countries of South East Europe, it is in a good position. The concentration of the insurance market in the Republic of Croatia is moderate and slowly, but surely it is developing into a concentrated market. Its growth is due to the successful implementation of external growth strategies of market leaders in the industry, which achieve it by taking over and merging with companies in the Republic of Croatia, neighbouring Bosnia and Herzegovina but also by spreading towards Western Europe. Also, the Croatian Parliament has adopted a new Capital Market Act that provides HANFA with larger supervisory authority, which is another advantage for insurance companies. Global economic integration requires all industries, including the insurance industry, to adapt to rapid change and become proactive in order to survive in a global market competition where competition is ever-increasing, digitization is becoming faster and it is necessary to apply economies of scope and scale to achieve maximum efficiency and effectiveness. All of this will have an impact on the entire insurance market in the Republic of Croatia in the future, and the market needs to be consolidated so that the industry could strive for a concentrated market where there is interdependence between insurance companies, so that in those conditions companies would recognize their interdependence and the fact that encouraging harsh competition could only diminish profitability for everyone, and focus on taking over companies outside of Croatia to strengthen their position of regional leaders. Bosnia and Herzegovina is a market where profitability is almost completely secured after takeover, as the market is fragmented with a large number of small and medium-sized companies which are no issue for Croatian corporations.

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# INTERNATIONAL CITY PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT: A SYNTHESIS FRAMEWORK

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## **ABSTRACT**

*The topic of international municipal partnerships (IMP) for sustainable development has attracted the attention of an increasing number of scholars, indicating that a burgeoning research field is maturing. However, the literature is highly fragmented and efforts to synthesize the overall state of the art in this area are still insufficient. By conducting a systematic literature review, this paper's purpose is twofold: (i) to gather and integrate findings on IMP for sustainable development and (ii) to assemble what are the main research avenues for further investigation. The analysis of the 70 selected papers revealed that, in the first place, the literature has not yet reached a consensus about the definitions and the main dimensions surrounding the process of IMP for sustainable development. In the second place, findings concerning the extent to what and how city international partnering can be drivers for sustainable urban development have also been dispersal. By integrating the results from previous studies on IMP in the area of sustainable development, this paper provides a conceptual framework that synthesizes and structures the main aspects of the research area and based on it, a holistic analysis of its state of the art. Both practitioners and academics can benefit from this framework, considering that it provides a comprehensive understanding of the main dimensions surrounding IMP in the area of sustainable development and climate change.*

**Keywords:** *International Municipal Partnerships, Sustainable Development, Systematic Literature Review*

## **1. INTRODUCTION**

Cities are fundamental actors in the quest for sustainable development (SD) and combatting climate change, being that most socio-environmental problems - as well their solutions - have their roots in local actions (Loorbach et al., 2016; United Nations, 2018). Against this background, cities have increasingly engaged across borders in collaborative initiatives with other municipalities either through international bilateral interactions or by linking it to transnational networks as a mean of increasing local capacity to cope with SD and climate-change-related challenges (Keiner and Kim, 2007; Johnson, 2018). In reflecting upon this trend, the topic has attracted the attention of an increasing number of scholars within the body of literature. The growing number of publications indicates that a burgeoning research field is maturing. Despite the increasing body of literature, the field is highly fragmented, where efforts to synthesize the overall state of the art of research in this area are still insufficient. The scholars' work on the field has been dispersed in terms of dimensions and the effects of transnational city partnering over urban sustainability. The conducting of a Systematic Literature Review (SLR) can thus provide a first contribution toward an integrative and holistic view of existing literature (Arksey and O'Malley, 2005). Therefore, the purpose of this review is twofold: (i) to gather and integrate findings on transnational city-to-city cooperation for sustainable development and climate change and (ii) to assemble what are the main research avenues for further investigation on the inquiry field. The contribution of this work consists of the development of a framework that synthesizes and structures the main aspects and diminutions of the research area and provides, based upon it, a comprehensive analysis of its state of the art. Both practitioners and academics from the research field can hence benefit from a systematic literature review as it can provide a comprehensive and interdisciplinary synthesis of the state of the art of the area.



The remainder of the paper continues as follow: section two aims to discuss the concept of international municipal partnerships for SD; section three clarifies the methodology employed to conduct the SLR; section four assembles the main results of the work; and, finally, section five summarizes the conclusions of this work.

## 2. CONCEPT DISCUSSION

In this study, we focus on international city partnerships whose primary mission is sustainable development promotion, either by focusing on specific issues such as sustainable mobility or renewable energy, or by covering climate change and sustainability in their broader scope of activities (Mocca, 2017; Wittmayer, Julia M et al., 2016). To achieve a comprehensive review of city partnerships beyond the national borders, international municipal partnerships (IMP) are understood in a broad sense in this paper, including both the bilateral and polycentric forms of cooperation between local authorities located in different countries (Fünfgeld, 2015). Even though there are some divergences about different terminologies used in the literature (Hafteck, 2003; Bontenbal, 2009), some common features characterize IMP. In the first place, IMP main actors are local governments from little towns to metropolis, located in two or more countries (Hafteck, 2003; Acuto and Rayner, 2016). These unities are composed of a myriad of actors from the public and private sectors from the local state apparatus and civil society (Bontenbal, 2009; Acuto and Rayner, 2016). Second, the notion of partnership entails relations of mutuality and reciprocity between partners (Tjandradewi and Marcotullio, 2009). Third, IMP is a multi-dimensional interactional process involving learning, exchange, collaboration and negotiation between multiple actors (Hewitt, 2002; Lintz, 2016). Fourth, not only multi-actor and multi-dimensional, but this process is also multi-level, including the processes taking place between the partner cities, but also those occurring within them (Bontenbal, 2009; Kern and Bulkeley, 2009; Lintz, 2016). Therefore, in order to analyze IMP, a multi-actor, multi-level and multi-dimensional process-based approach is needed.

## 3. METHODOLOGY

The present SLR follows the five steps suggested by Arksey and O'Malley (2005): i) preparation; ii) searching the literature; iii) selection of studies; iv) analyzing the data; and v) summarizing and reporting results. The first step included a primary quick overview of the literature to refine the research problems in order to map the relevant search terms as well as to develop a research protocol, which defines the content and activities for the following steps. For the second step, two groups of search terms were set: "city partnerships related terms"<sup>1</sup> and "SD focus-related terms"<sup>2</sup>, which were combined by boolean operators "OR" (within each group) and "AND" (between them). Searches of those keywords in title or abstracts in publications until 2018 were conducted in two databases (Web of Science and Scopus). A total of 195 unique records were retrieved in the databases, while an additional 19 scholarly works were added from snowball search to avoid the limitations of databases (Mongeon and Paul-Hus, 2016). In the third step, abstracts of retrieved papers were screened to identify what relevant publications should be included in the analysis sample, according to the respective exclusion criteria: i) the primary goal of the cooperation arrangement is neither related to sustainable development nor responds to climate change; ii) the work analysis municipal partnerships act within the national level; iii) the work analyzes single cities' experiences separately, not their joint collaborative activities; iv) the work only approaches municipal partnerships as a secondary phenomenon; v) the full version of the work is not accessible; vi)

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<sup>1</sup> City-to-city cooperation; international municipal cooperation; municipal international cooperation; decentralized cooperation; city partnership; municipal partnership; transnational urban cooperation; transnational municipal networks; city networks; cities twinning; town twinning; sister cities.

<sup>2</sup> Sustainability; Sustainable development; Sustainable urban development; Sustainable urbanization; Sustainable city; Climate change; Climate adaptation; Climate mitigation; Climate protection; Local Agenda 21; Environment



the full work is not in English. Of the 214 papers, 70 met the pre-defined criteria for selection and formed the study sample. The fourth stage consisted of a qualitative content analysis of the full-text documents, according to the following code-system: problems addressed or goals, central concepts and dimensions, main findings and recommendations for further research. Finally, the last step included the design of charts and the creation of a framework for mapping and synthesizing the main literature accumulated findings.

#### 4. RESULTS

Chart 1 indicates the growing number of publications in the area under investigation, particularly in the last decade. Surprisingly, during the 1990s, in the context of Local Agenda 21, launched by the United Nations, few publications associated IMPs with sustainable development and climate change discussions. In contrast, since 2001, and especially since 2012, a growing number of scholars have drawn attention to topics connecting international city collaborative arrangements to both these issues. Another relevant finding is that scholars' analyses have focused mostly on city partnerships for SD in the form of polycentric arrangements - i.e. city networks - as the bilateral agreements had received much less attention in the previous literature.

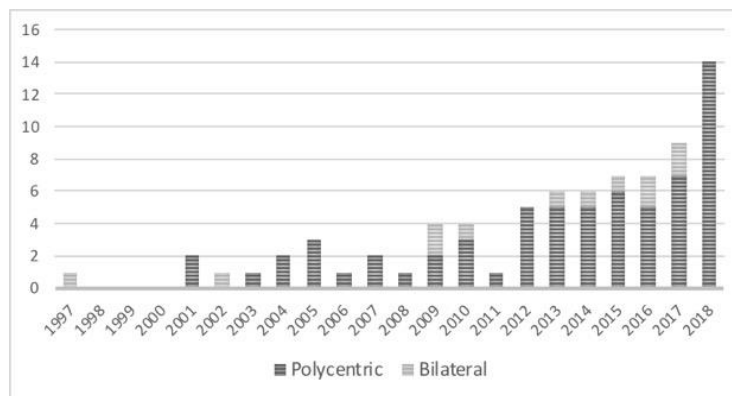


Chart 1: Number of publications evolution from 2001-2017 (own elaboration)

A research synthesis framework is proposed in figure 1 with the aim of assisting with the task of summarizing the accumulated knowledge in a research area with an increasing number of publications. This framework has been constructed as a structuring tool to assemble IMP for SD descriptors from the broad and dispersed literature. The main diagram identifying the dimensions of the literature, represented in figure 1, are critically summarized in the following subsections.

##### 4.1. Context and actors

As stated by van Lindert (2009), IMP “does not operate in a neutral politico-economic environment” (p.180); instead, individual and/or collective actors interact within a specific socio-political context. The interplay of values, knowledge and power of the actors, as well as the structure in which they are embedded, both shapes and is shaped by the IMP dynamics and effects (Bulkeley and Betsill, 2005; Lintz, 2016), as represented by the bidirectional gray arrows in the scheme. Among the multiple dimensions of the context of IMP for SD, the literature has documented institutional framework, power imbalances, and historic-political backgrounds. The institutional framework refers to the system of formal legal norms and rules that shape the courses of actors' actions including, for example, constitutional preconditions, environmental and planning law, administrations structures (Lintz, 2016; Hickmann et al., 2017), and the local governments' autonomy level from national and regional levels (Giest and Howlett, 2013).

Power imbalances relate to the pre-existing structural disequilibria in terms of actors' capacities; access to informational flows and inclusion in decision-making (Bulkeley, 2005; Bouteligier, 2013a; Gordon and Johnson, 2017). The historical and political backgrounds of the municipalities and their interrelations shape and set the pace of the scope and outcomes of their collaboration (Keiner and Kim, 2007; Hickmann et al., 2017). A vast landscape of actors interacts within the contextual frame, including politicians, representatives of administrations, experts, business, organized civil society, educational institutions and the media (Blok, 2012; Kurniawan et al., 2013; Schenone et al., 2017; Zeemering, 2014; Hickmann, 2017).

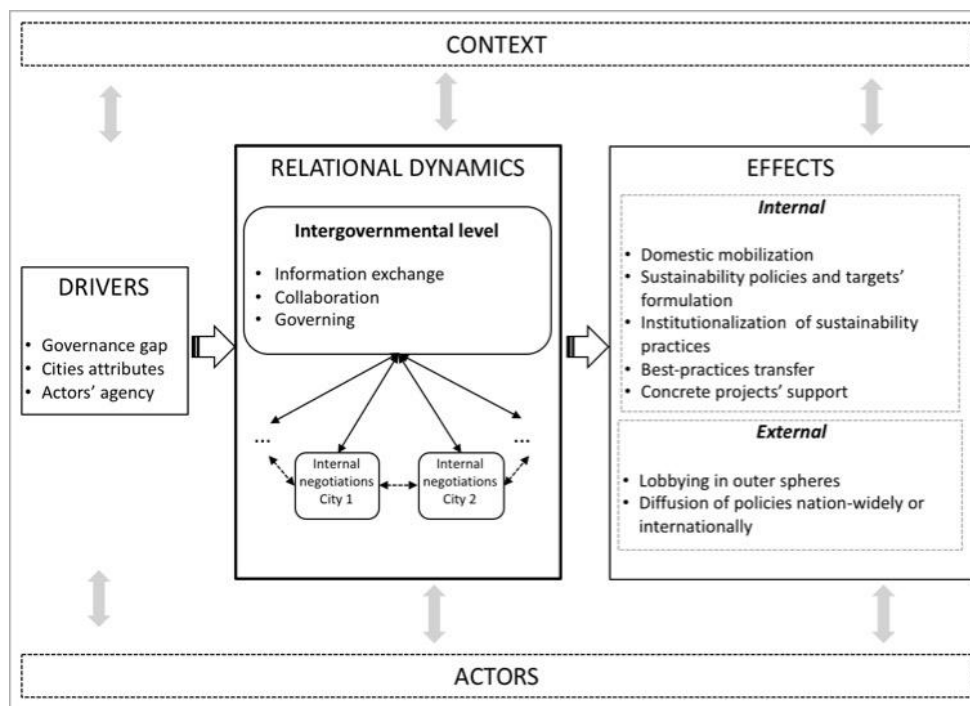


Figure 1: Literature search synthesis framework. (own elaboration)

#### 4.2. Drivers

The drivers refer to the main factors that help explain why IMPs for SD have been initiated in the first place. Previous scholarly discussions had provided a wide range of explanations based on cities' interactions with other governance levels, on their domestic features and on the agency of other actors. First, some scholars see the emergence of IMP for SD as a response to a governance gap in its being settled as a strategy to bypass national governments and the inefficiencies of international institutions to tackle SD and climate-change issues (Betsill and Bulkeley, 2006; Niederhafner, 2013; Lee, 2013; Johnson, 2018). Second, one further line of explanation focuses, in particular, on specific attributes of cities that lead them to join IMPs. Amongst the city features correlated to IMP for SD participation include the city globalization level (Lee, 2013), the degree of the city's vulnerability to environmental and climate-change stresses (Lee and van de Meene, 2012; Rashidi and Patt, 2018; Busch and Anderberg, 2015; Pablo-Romero et al., 2015), the city's technological innovation capacity and human capital availability (Mocca, 2017), financial and administrative autonomy (Mocca, 2017), the political orientation of local government (Mocca, 2017), public interest in sustainability issues and a supportive political culture (Zeemering, 2014). The third stream of explanation focuses on the actors' agency. From this perspective, cities join IMPs because of the pressure or leadership of specific individuals or collective actors aiming to maximize their interests and promote their values and norms (Betsill and Bulkeley, 2004; Niederhafner, 2013; Lintz, 2016; Kurniawan et al., 2013).

### 4.3. Relational Dynamics

Relational dynamics refer to the interactions that are triggered by maintaining and govern IMP for SD. Those dynamics cement the financial, political and discursive "glue" that hold cities together (Betsill and Bulkeley, 2004) and shape the SD challenges needing to be tackled and their respective solutions (Bouteligier, 2014; Gesing, 2018). The relevant relational dynamics occur in a multi-level system (Betsill and Bulkeley, 2006; Fuhr et al., 2018; Toly, 2008). In the intra-governmental level, the municipalities involved settle their priorities and formulate their positions, while at the intergovernmental level, city representatives negotiate and define their common goals as well as joining actions addressing SD issues (Kern and Bulkeley, 2009; Lintz, 2016; Davies, 2005). The inter-governmental negotiations are shaped and shape the interactional dynamics within the cities (bi-directional arrows). On the one hand, in being bound by their mandates, political representatives tend to uphold the positions previously formulated in the intra-governmental arena and therefore try to shape inter-city negotiations in that direction (Lintz, 2016; Davies, 2005). On the other hand, city representatives participating in IMPs can also intermediate implementation at the local level of policies that were formulated in intergovernmental fora by influencing local policy networks (Kern and Bulkeley, 2009). In addition to the interactions within the IMP formal activities, other important direct but informal connections between actors from the domestic level can also exist (Lintz, 2016; Bulkeley, 2005), as represented by the dashed arrows. Literature has predominantly reported the interactions occurring between cities, which can be schematically catalogued into three interrelated dimensions: information exchange, collaboration and governing. Concerning the first dimension, IMPs are platforms in which peers can exchange experiences, knowledge and capacities while learning from one another (Giest and Howlett, 2013; Keiner and Kim, 2007; Lee and Jung, 2018; Mocca, 2018b). Here, collaboration covers all the activities that cities pursue jointly in order to attain shared goals, including planning towards the solution of common problems (Happaerts et al., 2011; Lee, 2018), policies' coordination (Gordon, 2018) and channeling projects funding (Kern and Bulkeley, 2009; Happaerts et al., 2011). Concerning governing, this dimension deals with the relations related to the processes that design the goals and steer IMP programs and actions, including debate, political decision-making and policy formation (Kern and Bulkeley, 2009). The interactional dynamics within cities are explored somewhat less in the literature. Within intra-governmental policy-making arenas, the formulation of the positions to be upheld by the local authorities take place through interactions of negotiation amongst stakeholders and deliberation (Lintz, 2016). Furthermore, intra-city dynamics encompass institutional design strategies, including what and how local stakeholders come to participate in IMP activities (Zeemering, 2014; Fenton, 2017).

### 4.4. Effects

In attempting to summarize dispersed results in the literature about how and the extent to which IMPs affect sustainable development responses, we discriminate IMP effects according to two types - the internal and external. 'Internal' refers to the outcomes taking place within the partner cities, while 'external' relates to the results from IMPs action at outer spheres, such as the national, regional and international levels. While bilateral IMPs predominantly generate internal outcomes, networked city partnerships can also perform external effects. Regarding external IMPs outcomes, city networks can voice cities' concerns and priorities by representing their members at national, regional and international forums, while influencing decisions and norm-building processes (Bulkeley et al., 2003; Bulkeley, 2010; Kern and Bulkeley, 2009; Happaerts et al., 2011; Busch, 2015; Fenton, 2017; Fraundorfer, 2017; Busch et al., 2018; Toly, 2008). Furthermore, IMPs can facilitate the diffusion of urban sustainability strategies, policy innovations, standards or green technologies nationwide or internationally (Fenton and Busch, 2016; Hakelberg, 2014; Kurniawan et al., 2013; Mejía-Dugand et al., 2016; Zeemering, 2014;

Gesing, 2018; Joas and Grönholm, 2001; Román, 2010; Smeds and Acuto, 2018). With regard to internal effects, IMPs can affect local SD policies in different forms, which can then be categorized in five groups: i) Enabling domestic mobilization; ii) formulating new policies and targets; iii) institutionalizing practices; iv) transferring best practices; and v) offering project support (Busch et al., 2018). Firstly, IMPs can facilitate local mobilization and engagement on climate governance and sustainability-oriented processes (Bulkeley et al., 2003; Lee and Koski, 2014; 2015; Busch, 2015; D'Auria, 2001; Rohat et al., 2017), by raising awareness and social capital amongst policy-makers and the general public (Giest and Howlett, 2013; van Lindert, 2009; Busch et al., 2018; Buckley et al., 2015). Secondly, IMPs can induce local governments to adhere to new local sustainability policies and emission reduction targets (Bansard et al., 2017; Fraundorfer, 2017; Lee and Jung, 2018; Yu et al., 2016; Rashidi and Patt, 2018; Krause, 2012; Pablo-Romero et al., 2015). Thirdly, IMPs encourage the integration of sustainability and climate change responses into local institutions through binding documents or creation of new positions in local governments for climate or urban sustainability managers (Busch et al., 2018; Beermann, 2017). Fourthly, by fostering peer-to-peer exchanges, IMPs can intermediate the adoption of innovative urban sustainability solutions by the partner municipalities (Fenton and Busch, 2016; Keiner and Kim, 2007; Niederhafner, 2013; Blok, 2012; Zeemering, 2014; Hakelberg, 2014). And finally, IMPs can provide technical and financial support for the implementation of concrete projects aiming at furthering sustainable pathways in urban planning and public services provision (Feiner et al., 2002; Keiner and Kim, 2007; Schmid and Eggenberger, 1997; Yu et al., 2016; Beermann, 2017; Fünfgeld, 2015; van Lindert, 2009; Villiers, 2009; Takao, 2010; Tjandradewi and Marcotullio, 2009).

#### **4.5. Research Avenues**

This section consolidates the main areas for future research identified by previous scholarly works, with the aim of designing a research agenda for the topic of IMP for SD.

- IMPs for SD functioning. Future research should refine theoretical explanations of the interactions between collaboration, information exchange and governing and how these elements interact and evolve (Taylor, 2012; Lee, 2013). There is also room for research into how different contextual elements, actors and relational dynamics within and between cities shape IMPs' outcomes (Fenton and Busch, 2016; Zeemering, 2014).
- The role of IMPs for SD in a multi-level governance system. Further studies can contribute to a clearer picture of the IMPs' role by further investigating, for instance, their interactions with other IMPs and with emerging processes of international and national SD governance (Johnson, 2018; Hickmann, 2017; Smeds and Acuto, 2018). Furthermore, measuring their longer-term impacts and members' de facto implementation of commitments made at the intergovernmental level are also essential topics (Krause, 2012; Busch, 2015; Pablo-Romero et al., 2015).
- Intra-cities dynamics. First, more research could be conducted about internal decision-making processes that define cities' positions in the context of IMPs (Busch and Anderberg, 2015). Second, there is also room for research on how local bottom-up initiatives are included in the IMP agendas (Beermann, 2017; Fenton and Busch, 2016), and vice-versa; namely, how IMP ideas and innovations are intermediated to local networks (Kern and Bulkeley, 2009; Zeemering, 2014). Third, the challenges of bringing together the necessary actors to formulate and implement successful urban environmental strategies and policies also deserve more attention in future research (Bouteligier, 2014; Hartmann and Spit, 2015).
- Legitimacy of IMPs for SD. Future studies should critically evaluate the quality of members' participation and scrutinize the political conflicts and inequalities within the IMPs (Bouteligier, 2013b; Betsill and Bulkeley, 2006; Fünfgeld, 2015; Geldin, 2018), for instance, in terms of the discursive struggles associated to the definition of what is

considered “best practices” (Blok, 2012; Mocca, 2018a; Fenton and Busch, 2016; Bouteligier, 2013b). Furthermore, it is important to assess critically the extent to which, and for whom, IMPs are making a difference to these transitions to sustainability (Happaerts et al., 2011; Johnson, 2018; Rashidi and Patt, 2018).

## 5. CONCLUDING REMARKS

As evidenced by the number of papers recently published, despite the growing interest in IMPs for SD, efforts to synthesize the state-of-the-art in this topic have so far been limited. This paper provides a first step to fill this gap by conducting a systematic review of the existing literature. This review has hence been based on a research synthesis framework gathering IMP for SD descriptors in the broad areas of context, actors, drivers, relational dynamics and effects. By gathering the previous scholarly recommendations for further inquiries, this paper has also provided an overview of the main avenues for future research, which includes how IMPs for SD function; their role in a multi-level governance system; the related intra-cities dynamics; and their legitimacy. Besides the topics identified, the bilateral IMPs for SD deserves more attention in the literature, given the lack of research on this topic. In addition, further research would also be encouraged on the basis of the conceptual framework presented, including assessments of the state of IMPs for SD in various countries and the significance and interactions of the dimensions identified in the framework. Finally, some limitations of this work need to be acknowledged. In the first place, for practical reasons, this SLR relied on a limited number of databases and focused on scholarly works published in English. Further work could refine this synthesis framework by reviewing literature from other databases and written in other languages. In the second place, this work has been limited to scholarly works, whereas further analysis could contrast the summarized academic findings with the gray literature data.

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## WHAT PRICE FOR SUSTAINABLE FOSSIL OIL?

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### **ABSTRACT**

*Growing concerns rise about the resource finiteness and externalities associated with the extraction and the combustion of fossil fuels. This work evaluates the hidden cost of the unsustainable use of fossil oil using (1) a resource-related and (2) a CO<sub>2</sub> emission related approach. Our model evaluates the external costs as the differential between current fossil oil market price and their theoretic counterpart, assuming, alternatively, a sustainable extraction and emission level. Our contribution provides numerical estimates for fossil oil depletion and CO<sub>2</sub> emission externalities, and will allow for precise calibration of existing «Directed Technological Change» models to direct carbon taxes toward the development of clean, renewable alternatives.*

**Keywords:** *Carbon tax, Directed Technological Change, Fossil Oil, Sustainability, Price-Demand Elasticities*

### **1. INTRODUCTION**

Fossil oil is one of the major energy sources throughout the world and accounts for one third of global primary energy supply and 95% of transport energy use, where no substitutes are easily available. It has various appealing properties, is easily transportable, and has a mass to energy ratio which is unequaled. In 2017, 98,1 millions of barrels of oil were consumed on a daily basis world-wide and totaled 35 billions of barrels over the year.<sup>1</sup> Fossil oil consumption accounts for one third of global carbon dioxide emissions: 12 billion tons - gigatons - of CO<sub>2</sub> (equivalent to 3,28 gigatons of carbon)<sup>2</sup> While global CO<sub>2</sub> emissions stood at 36.2 Gigatons in 2014, projections of the U.S. Energy Information Administration indicate 43 Gigatons for 2040. Simultaneously, the Conference of the Parties to the United Nations Framework Convention on Climate Change, shortly COP, aims, since 1992, at reaching a global agreement on emission reduction. The COP15 in Copenhagen agreed to limit global warming to 2°C (above pre-industrial levels) at horizon 2100 and the COP21 held in Paris, representing 80 countries and 60% of total emissions, provided specific timetables to reduce Green House Gas emissions (GHG), with carbon dioxide at its top. While fossil oil combines unequaled characteristics for energy and industrial applications and a tremendous part in GHG emissions, « one liter of gasoline [remains] cheaper than a cup of coffee » (Miller and Sorrell, 2013). The work hereafter argues that fossil oil, as a natural resource, is dramatically undervalued to meet the COP21 commitments and, generally speaking, a form a sustainability. The contribution of this article lies in providing estimates of the external costs related to over-exploiting fossil oil. We allow for two different approaches of sustainability. In our first approach, we investigate the potential market price response to decreasing fossil oil consumption to its natural renewal rate. This resource-focused approach of sustainability, avoids over-exploiting natural resources and yields a zero carbon balance. The difference between this «sustainable price» and the current market-price can be analyzed as the cost of over-exploitation, incurring negative externalities, currently not incorporated into prices. The second approach to sustainability is emission related and supposes a CO<sub>2</sub> emission reduction stemming from lower oil consumption, in accordance with

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<sup>1</sup> Most oil statistics are drawn from the IEA oil overview, released in 2018, based on 2017 figures and, from the latest BP Statistical Review of World Energy, released in June 2018.

<sup>2</sup> The atomic weight of CO<sub>2</sub> is 44 while than of carbon is 12, hence converting carbon to CO<sub>2</sub> emissions simply requires a scaling factor of 3.67.

the Paris COP21 commitments. It implies less dramatic constraints on oil consumption worldwide and yields lower estimates of sustainable equilibrium prices. As a consequence, the external cost of emission unsustainability is lower than the «resource» equivalent. The results of our simulations are confronted with technological, renewable alternatives as backstop technologies to fossil oil. Solar fuels (among which potentially hydrogen and methane) are synthetic chemical fuels produced through the use of solar energy. They will provide for a storable, sustainable and carbon-neutral alternative to fossil fuels. The remainder of the article is organized as follows. Section 2 focuses on the strong approach of sustainability, by investigating how limiting extraction to the natural renewal level would impact prices. Section 3 exposes a less ambitious definition of fossil oil sustainability, and simulates equilibrium prices given the COP21 commitments regarding emission reduction until 2100. Our results are discussed in section 4. Section 5 summarizes our results and concludes.

## **2. RESOURCE-BASED SUSTAINABILITY IN FOSSIL OIL CONSUMPTION**

The availability of abundant and cheap oil during the last century led to un-precedented economic growth, especially after WW2. However, the still growing extraction and consumption of fossil oil cannot overcome geological constraints and economic feasibility and the fear about future resource scarcity (peak oil) emerged over the last decennials. The geological view suggests that oil reserves are, ultimately, finite, while the economic approach explains how the easiest-to-extract oil has already been used up and costs of extraction should be expected to rise. Proponents of technological change argue, however, for continuous technological innovations to (1) improve extraction methods and (2) uncover new sources of fossil supplies, such as tar sands or shale gas (See Benes et al. (2015) for a detailed comparison of these opposing views regarding future oil supply).

### **2.1. The natural renewal rate of fossil oil**

Academic work has mainly focused on the depletable nature of oil, starting with Hotelling (1931). The proposed model provides an optimal extraction path for depletable resources along with the insight that the finiteness of natural supply should provide the owner with a scarcity rent, that is, a commodity price higher than the marginal extraction costs, steadily increasing with the risk free rate of return. While numerous extensions of the Hotelling framework have been proposed<sup>3</sup>, empirical evidence fails to meet the theoretical predictions. Neither does the oil price account for an increasing scarcity rent, nor does global use of the depletable resource decrease over time. And with the discovery of shale oil and tar sands, altogether with the technical and scientific knowledge of transforming “unfinished” kerogen into petroleum, the danger of peak oil faded away. However, as 90% of extracted fossil oil is currently burnt, the ever-growing extraction and consumption rates are raising increasing concern for carbon dioxide concentrations in the atmosphere. The carbon released today stems from fossilized organic materials a few million years ago. The climate impact is not due to the fact that carbon dioxide is released into the atmosphere by fossil oil combustion, it is merely a question of speed: while approximatively 5 million barrels are naturally “produced” by geological processes annually (Miller, 1992), the rate of extraction (35 trillion barrels) is nearly 7000 times as high. Depletion of fossil oil at this tremendous rates involves heavy externalities. The latter are defined as “costs or benefits that affects a party who did not choose to incur that cost or benefit”(Buchanan and Stubblebine, 1962). In the context of natural resources, external, sometimes called social costs can arise when extraction or consumption causes damages to the stock or the environment, but latter are not integrated in the current market price of the resource.

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<sup>3</sup> Early contributions include Stiglitz (1976) or Devarajan and Fisher (1981). A more recent overview is provided in André and Smulders (2014).

Fossil oil is prone to a number of potential negative externalities, among which resource depletion, CO<sub>2</sub> (or equivalent GHG) emissions or air pollution. Taking into account the social costs instead of the private benefits may lead to different market equilibria as shows figure 1.

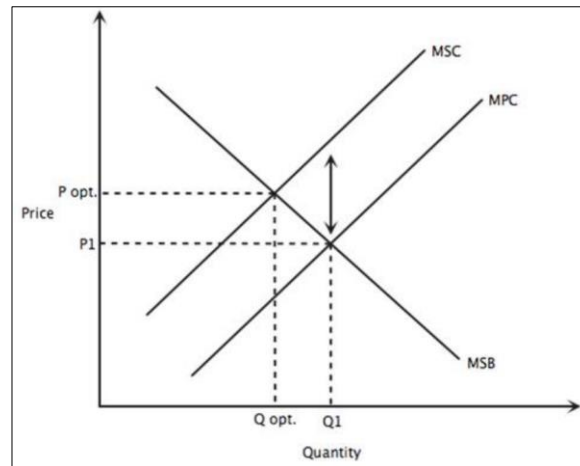


Figure 1: Market Equilibrium with/without externalities

The figure above displays two market equilibria, one according to marginal private costs (MPC) and marginal social benefit (MSB), yielding quantity  $Q_1$  and price  $P_1$ , the other involving a higher marginal social cost (MSC), MSB being hold constant. In this case, the optimal price increases to  $P_{opt}$ , while the offered optimal quantity decreases to  $Q_{opt}$ . Without taxes or other corrective equivalents, the initial equilibrium prevails implying negative externalities symbolized by the vertical double-arrow. The modeling of external costs, such as greenhouse gas, dates back to Nordhaus (1994) and gave birth to a fertile area of research, among which the attempt to direct technological change towards clean and sustainable alternatives to depletable resources, as the latter often come with heavy externalities. While the external costs sometimes count in tens of thousands of dollars per ton for air or soil pollution (Andersen, 2007), market prices for crude oil still only reflect relatively low extraction costs. In the absence of any significant scarcity rent or adequate carbon taxes, it appears that market mechanisms alone will not significantly increase oil prices over the next decades (See Caldara et al. (2018) for forecasting methodologies and Haugom et al. (2016) for long term estimates of oil prices.), a necessary condition to reduce fossil oil consumption, search for technological alternatives and embark on the sustainability road. Oil depletion is obviously a negative externality, as the speed at which previous and current generations consume fossil oil stands in no relation to its renewal rate. Every barrel consumed today, may it ensure economic growth or only comfort today, will not be available for future generations and economic activity and to recover from one year of current consumption of fossil oil, it will take 7000 years without any extraction. As the currently extracted oil is not available to “fuel” growth tomorrow, what appears to be an intertemporal decision problem for economists, found its way through the Brundtland report in 1987: sustainable development was coined as “the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.(United Nations World Commission on Environment and Development, 1987) By combining sustainability and negative externalities stemming from depletion, it appears that “The ideal retail price in terms of sustainability would include the costs of maintaining the stock of natural resources” (Bartelmus, 1994, p. 45-52). As externalities related to fossil oil depletion are (1) difficult to capture and (2) to evaluate financially, we propose a novel approach: by establishing what price levels could be considered as high enough to reduce theoretic oil demand to a sustainable level, we define a theoretic sustainable price.

It is established using today's market-price characteristics, such as the current market price and price-demand elasticities. This approach allows us to determine what equilibrium price would prevail for an offer restricted to the natural renewal rate. The pricing of negative externalities, that is, the unsustainable aspect of fossil oil consumption levels is defined as the difference between current market prices and the "restricted offer" price.

## 2.2. Simulating strong supply-side sustainability

Sustainability regarding oil extraction can be understood as limiting oil consumption to what nature produces, that is 5 million barrels per year. This natural renewal rate must be compared to the 98 million barrels per day extracted over 2017; totaling 35 trillion barrels per year. Our approach aims at evaluating external costs stemming from unsustainable fossil oil extraction by simulating the sustainable market price  $P_s$  prevailing with current market characteristics, when the global offer falls to the natural renewal rate, yielding a sustainable offered quantity  $Q_s$ . Using current values of price and quantities ( $P_c$ ,  $Q_c$ ) as an anchor, price-demand elasticity (denoted  $\epsilon$ ) characterizes the price increase for a given decrease in quantity:

$$\epsilon := \frac{\% \text{ change in quantity}}{\% \text{ change in price}} \quad (1)$$

with

$$\begin{aligned} \% \text{ change in quantity} &= \frac{Q_s - Q_c}{Q_c} \\ \% \text{ change in price} &= \frac{P_s - P_c}{P_c} \end{aligned} \quad (2)$$

It follows that

$$P_s = P_c + \frac{(Q_s - Q_c) \times P_c}{Q_c} \times \frac{1}{\epsilon} \quad (3)$$

Put differently,

$$C_{ext} := P_s - P_c = \frac{Q_s - Q_c}{Q_c} \times P_c \times \frac{1}{\epsilon} \quad (4)$$

With  $C_{ext}$  being the differential between the sustainable price of fossil oil and its current market price, that we defined as the negative externalities resulting from unsustainable oil consumption. Hence, the costs of unsustainability, in this context, increases with the current market price  $P_c$ , the proportional over-consumption relatively to the sustainable level  $(Q_s - Q_c)/Q_c$  and the price-demand elasticity  $\epsilon$ , indicating how dependent consumers are towards fossil oil. The first two aspect relates to the fact that externalities are proportional to the resource price and the relative over-consumption: the higher the latter, the higher the pricing of the unsustainability-related externality. The second aspect requires more "care".

In our framework, the externality pricing depends on price-demand elasticities: the lower the elasticity, the higher the price of negative externalities related to over-exploiting the resource. This is due to the fact that our framework not provides for objective externality values, but for market prices. Hence, highly demanded goods without easily available substitutes should experience higher externality costs. Such high values may deter the market from over-consuming/over-extracting resources, a process, that might restore a sustainable equilibrium, once the market price correctly values those negative externalities. The use of empirical price-demand elasticities is crucial in this context. The range of price elasticity of demand, reported in literature is very broad and depends on the statistical approaches and the time horizon: Cooper (2003) uses annual time series regressions and reports a long-term  $-0.21$  on average for 21 countries, while a co-integration approach leads to a spectacular inelastic figure of a short-term  $-0.005$  in Krichene (2002) over the period 1973-1999. Generally, demand elasticities, found in literature, range from  $-0.05$  to  $-0.07$  for the short-term, and from  $-0.21$  to  $-0.30$  for the long term, as reports Haugom et al. (2016). Since our focus is on rather long-term sustainability and not short-term price movements, our simulations will be conducted with empirical long-term elasticities. As it is shown in figure 2, in the magnified part in the upper right corner, current plausible long-term elasticities between  $0.2$  and  $0.3$ , negative externalities of depleting fossil oil 7000 times faster than its renewal rate, are valued between  $200\$$  (highest elasticity,  $60\$$  per barrel) and  $400\$$  (lowest elasticity,  $80\$$  per barrel) dollars par barrel. This valuation of unsustainability costs (1) increases on current price levels and (2) decreases in price-demand elasticities.

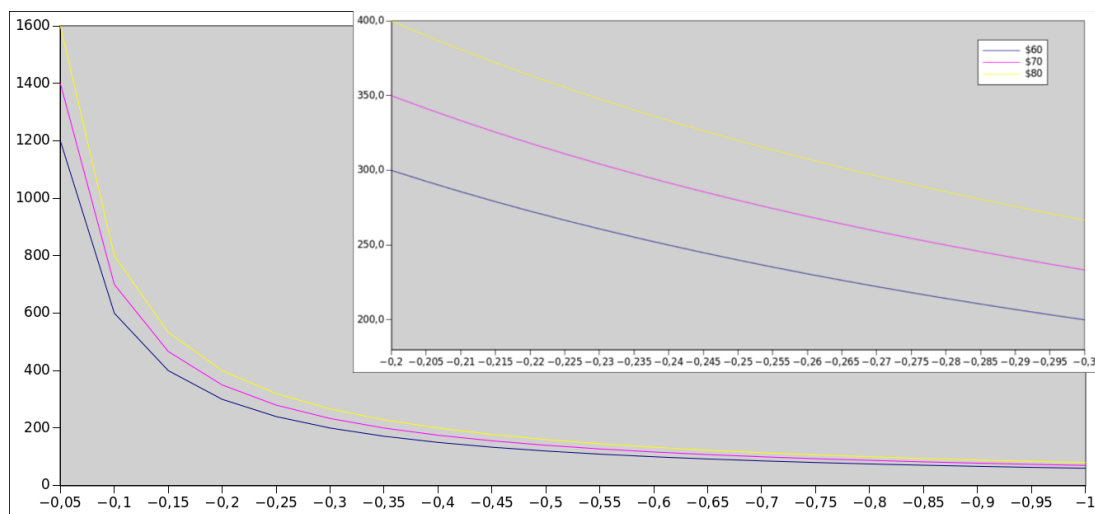


Figure 2: External costs related to unsustainable fossil oil consumption

The figure above displays simulated externality costs using a unit price of  $70\$$ , which is an average value for 2018 for both WTI (Western Texas Intermediate) or Brent crude oil, but also current barrel prices around  $60\$$  and another, higher, estimate of  $80\$$ . We moreover assume a sustainable level of 5 million barrels annually and the above mentioned range of elasticity values  $\varepsilon$ . The ideal barrel-price of oil, integrating unsustainability external costs in addition to the market price, would hence sum up to 350 dollars per barrel, with median parameters ( $\varepsilon = 0.25$ ,  $70\$$  per barrel), a value 5 times as high as current prices. Taking account externalities of fossil oil depletion at current rates also shows that alternative, sustainable solutions, such as solar fuels<sup>4</sup>, which has been estimated at  $279\$$  per barrel in a recent work (Trieb et al., 2018) are less costly and could be highly competitive in this context. The availability and impact of such “backstop” technologies will be discussed later.

<sup>4</sup> For a presentation of solar liquid fuels, see Fukuzumi (2017).

### 3. CO<sub>2</sub> EMISSION RELATED UNSUSTAINABILITY

In the previous section, we proposed a framework to evaluate unsustainability external costs occurring when extracting and consuming fossil oil over its natural renewal rate of 5 million barrels per year. Alternatively, and less constraining for global consumption, a sustainable approach to oil consumption could focus on the reduction of carbon dioxide emissions, which should not exceed a given threshold, as those provided by Schellnhuber following the Paris COP21 commitments: the cumulative carbon budget until 2100 would be of no more than 270 gigatons to reach the 2°C target, and 110 gigatons for the 1.5°C target; respectively 30 and 12 years of current, yearly emissions. The previously presented framework using current market price and price-demand elasticities will allow to focus on oil consumptions, that are compatible with emission sustainability (measured by CO<sub>2</sub> equivalent). This sustainability level appears weaker than the previously used resource-sustainability and, perhaps imperfect, for two reasons. On the one hand, extraction is not limited to the renewal rate and the resource remains over-exploited. On the other hand, the CO<sub>2</sub> budget, that will be assumed, limits global warming to 2°C compared to pre-industrial levels. Full CO<sub>2</sub> sustainability would probably focus on a 0°C temperature increase. It is nonetheless of interest, as taking into account primarily CO<sub>2</sub> externalities might appear as more crucial in the context of global warming.

#### 3.1. Current emissions and contributing fossil fuels

Global emissions of CO<sub>2</sub> were 9,8 gigatons of carbon in 2013, and are expected to rise over the following decennials. Fossil oil represented 33% in 2013, coal accounting for as much as 42%. As Harris et al. (2017) reports, limiting global warming to 2°C allows a cumulative carbon budget of 270 gigatons of carbon for the period 2016 to 2100 (3.21 gigatons carbon per year), but about 30 years of emission at current levels. Given today's emission, this would imply a annual reduction of 6,6 gigatons. This substantial reduction of CO<sub>2</sub> emission must impact all fossil fuels (coal, fossil oil, gas, etc) proportionally to their current contributions or from a sole fossil energy source. As fossil oil represents 33% of current carbon emissions, a CO<sub>2</sub> limiting approach to oil use, would imply a 2.2 gigatons of carbon reduction, which represents more or less 20,7 trillion barrels (assuming that 90% of extracted fossil oil is burnt). Compared with the annual consumption of 35 trillion barrels, it represents a cut of two third.

#### 3.2. Simulating CO<sub>2</sub> emission related externalities

Figure 3 shows externality costs related to failing to comply with the necessary 2/3 cut in oil consumption, from 35 trillion barrels annually down to 14,3. The magnified part of the graph indicates external costs for long-run demand-price elasticities  $\epsilon$  between  $-0.2$  and  $-0.3$ .

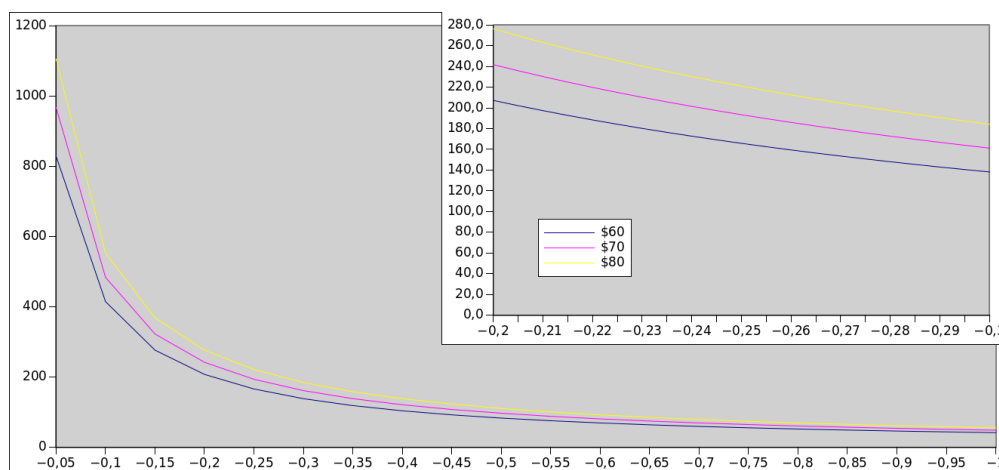


Figure 3: External costs related to unsustainable CO<sub>2</sub> emissions from fossil oil

The figure above displays simulated externality costs using a unit price of 70\$, which is an average value for 2018 for both WTI (Western Texas Intermediate) or Brent crude oil, but also current barrel prices around 60\$ and another, higher, estimate of 80\$. We moreover assume a sustainable level of 14,3 million barrels of crude oil consumed annually and the above mentioned range of elasticity values  $\varepsilon$ . In this context, allowing for a broader concept of sustainability, external costs are generated by the fact that oil consumption lies above CO<sub>2</sub> sustainable figures. Failing to cut fossil oil consumption by 2/3 of current volumes imply externalities valued between 138 (highest elasticity, 60\$ per barrel) and 276 (lowest elasticity, 80\$ per barrel) dollars par barrel. As previously, unsustainability costs (1) increase on current price levels and (2) decrease in price-demand elasticities. As the sustainability threshold is lower than in section 2.2, the average “true” price, comprising CO<sub>2</sub> related external costs in addition to the market price, is also less extreme, with 263\$ per barrel, with median parameters ( $\varepsilon = 0.25$ , 70\$ per barrel). This price appears to be very close to that of currently available and carbon neutral fossil fuel (279\$ per barrel).

#### 4. DISCUSSION

The external costs modeled throughout this work have several practical and theoretical implications. While our approach might be subject to methodological limitations, the results from our simulation especially show that solar fuels, as a backstop technology, are a competitive alternative to their fossil equivalent and might have already evinced them from the market, if the latter integrated externalities in market prices. This holds even at their current, still experimental stage. Our results also allow for a precise calibration of “directed technological change” models, which aim at redirecting taxes from “dirty” inputs towards “cleaner” sources of energy.

##### 4.1. Limits to our approach

The model presented above evaluates externalities using price-demand elasticities, which are subject to methodological limitations, especially regarding the fact that elasticities are point-estimates, and might not hold outside the current market size (quantities) and price. Moreover, empirical approaches and values of price-demand elasticity differ among previous work.

##### 4.2. Backstop technologies

Since Nordhaus (1973), a backstop technology is defined as “an ultimate technology using a superabundant resource and capital as inputs”. Several economic works, most of which belong to the field of Directed Technological Change (in the sense of Romer (1990) and Acemoglu (2002)) have investigated the impact of the availability of backstop technologies on the extraction path of non-renewable resources, with various conclusions.<sup>5</sup> It appears in all cases that the backstop technology cost acts as a threshold, where consumption shifts (progressively or immediately) from depletable to renewable resources. A vast majority of our simulation scenarios imply total oil costs (including externalities) above 250 dollars per barrel, and might be significantly higher due to elasticity mis-specification. It is hence very plausible that sustainable, alternative technologies, among which electrolysis (generating hydrogen) or artificial photosynthesis, combining carbon with hydrogen atoms (methane, ethylene, etc) will be able to replace fossil fuel in a near future. According to the extensive literature in the field, and with no surprise, the depletable and more costly technology will be abandoned. In our context, and with fixed backstop technology costs, the eviction will arrive more easily in the resource-focused sustainability context, than in the weaker, CO<sub>2</sub> emission related, sustainability context. However, while the current backstop technology costs appear lower than the total fossil oil price, including externalities, such high energy costs make their diffusion highly improbable.

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<sup>5</sup> See Damsgaard (2012) for a recent review.



### 4.3. Directed technological change and carbon taxes

Unlike many other economical approaches, *Directed Technological Change* assumes technological changes (and their resulting costs) as endogenous and largely dependent from public initiatives. Acemoglu et al. (2012) and André and Smulders (2014) provide interesting frameworks, with competing renewable and depletable resources/technologies. They show how public policies with simultaneous carbon taxes on fossil fuels and subsidies to renewable alternatives would induce technological change. The valuation of externalities related to unsustainable fossil oil use provides an interesting approach, how to calibrate those models and carbon taxes. Particularly, the model provided by Acemoglu et al. (2012) relies, among others, on the elasticity of substitution among the competing technologies. Unlike solar or wind electricity as green alternatives to fossil oils, solar gaseous fuels, such as methane or hydrogen, or their liquid counterparts, will rather easily substitute with gasoline. Such a high degree of substitution is shown to rapidly redirect technological change towards the cleaner technology, provided that public policies provide an "immediate and decisive" intervention in the form of carbon taxes and research subsidies. Failing to do so, due to market size and the initial productivity of the fossil oil sector, argues Acemoglu et al. (2012), will lead to an environmental disaster. Our analysis shows that according to the degree of sustainability that is targeted, fossil oil might be evicted from the market. Especially for the strong supply-side sustainability, where oil consumption should remain within the natural renewal rate of approx 5 million barrels per year, price increases would be high enough to switch to sustainable solar fuels entirely, currently valued at 279 dollars per barrel. In this context, carbon tax policies would, financially, collapse. When weak sustainability is considered in the spirit of the COP21 commitments regarding an annual CO<sub>2</sub> reduction to 3.21 gigatons carbon per year, our results show lower simulated "total" oil prices, which often remain under the 279 dollars threshold for solar fuels. In this context, simultaneous use of both fossil oil and renewable fuels may occur. Finding the optimal equilibrium in this CO<sub>2</sub> related context, that ensures sufficient R&D subsidies stemming from the use of carbon-taxed fossil oil and directed to the development of solar alternatives, requires a dynamic approach involving the valuation of environmental externalities as provided here and is an interesting path of further research.

### 5. CONCLUSION

The rate at which fossil oil is currently extracted and burnt, stands in no relation to its natural renewal rate or the ability of environment to absorb the combustion related emissions of carbon dioxide. Using two different approaches of sustainability, one resource-, the other emission-related, we provide a model to evaluate, in financial terms, the external costs of being unsustainable. Our simulations, using current market data and characteristics, show external costs between 200 and 400 per barrel for the resource-sustainability and between 138 and 276 dollars per barrel for the emission-related unsustainability. Median estimates are, respectively 350 and 263 dollars. Compared to current per-barrel estimated costs of solar fuels, an renewable, zero-carbon alternative, our results show that, when externalities are accounted for, latter may act as a backstop technology, entirely replacing fossil fuel in the strong sustainability case. The second scenario, based on the COP21 commitments on CO<sub>2</sub> emission reductions, shows a total fossil oil price (market price and externalities), that might remain competitive against solar alternatives. As a consequence, a optimally calibrated carbon tax on fossil oil would allow to (1) take into account externalities, (2) provide subsidies for cleaner alternatives R&D and, finally, (3) increase, at least progressively, natural resource and emission sustainability.

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## LABOUR PRODUCTIVITY EFFECTS OF INVESTMENT SUPPORT FROM THE COMMON AGRICULTURAL POLICY IN POLAND

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### ABSTRACT

*The European Union puts particular emphasis on regional and national competitiveness due to its importance for the economic growth. Hence, one of the main objective of agricultural policy is to improve the economic situation of farms. This goal can be achieved by support instruments, which ensure increase in the competitiveness and productivity of farm. The paper studies the effect of support for investments from the Rural Development Programme (RDP) under the second pillar of the Common Agricultural Policy (CAP), on an increase in labour productivity on the Polish farms. Labour productivity is defined as gross value added per annual work unit (GVA/AWU). Two types of operations under the RDP 2014-2020 are studied: "Modernisation of agricultural holdings" (sub-measure 4.1) and "Premiums for young farmers" (sub-measure 6.1). Co-financing of investments in technical equipment should lead to an increase in gross value added and thus a growth in labour productivity. We estimated the average treatment effect of analysed subsidy by comparing the group of beneficiaries to the control group of farms with similar distributional characteristics as the treatment group. The Propensity Score Matching method is used to estimate matched control group and handle selection bias. The study uses data from the Polish FADN (Farm Accountancy Data Network) regarding over 3,000 individual farms.*

**Keywords:** *Common Agricultural Policy, farms, labour productivity, propensity score matching*

### 1. INTRODUCTION

The provisions of the Treaty establishing the European Community define the Community's tasks and determine the way of their implementation, by establishing, inter alia, the common policy in the field of agriculture. The objectives of the common agricultural policy are to increase the agricultural productivity, provide a decent standard of living for rural societies, stabilise markets, guarantee security of supplies and provide consumers with food prices at an acceptable level. A method to increase the agricultural productivity is "to promote technical progress, the rational development of the agricultural production as well as the optimal use of production factors, especially labour" (Treaty..., 2006). The common agricultural policy (CAP) has been evolving over the years, adapting to ever-changing conditions and needs, shifting from supporting the production to increasing the competitiveness (Czubak, 2013). In the programming period covering the years from 2014 to 2020, when building the objectives of the second CAP Pillar, the basis were the priorities aimed at guaranteeing the sustainable rural development. Fostering the competitiveness of agriculture was included as one of the objectives of the European Agricultural Fund for Rural Development (Regulation..., 2013), implemented by Priority 2. on increasing the farm profitability and the agricultural competitiveness in each

region as well as promoting innovation. Since 2004, Poland has become a member of the European Community which translated into access to wider outlet markets, the possibility of using support, as well as hedge the activities, including agricultural, with the series of standards, specified in the Union legislation. In order to address the competition on the EU market, it is necessary to restructure and modernise farms, with the help of support measures. In a SWOT analysis, carried out for the purposes of the Rural Development Programme for 2014-2020, the weaknesses of the Polish agriculture included, inter alia, the unfavourable agrarian structure, excessive labour force, insufficient technical equipment and low labour productivity (cf. RDP 2014-2020, 2018). As pointed out by Zawalińska, Majewski and Wąs (2015), farmers' income in Poland, per one full-employee, despite its continuous growth, is still at the level of 1/3 of the EU average. Domańska and Nowak (2014), as the reasons for productivity disparities indicate differences in the capital-labour ratio and employment level. Appropriate technical equipment, buildings and structures enable the effective use of the production potential of farms and thus obtaining competitive advantages (Czubak, Sadowski and Wigier, 2010). The objective of the article is to estimate the net treatment effect of payments aimed at supporting investments in individual farms and are granted under the types of operations "Modernisation of agricultural holdings" and "Premiums for young farmers". The impact of support on the labour productivity was assessed using the propensity score matching method.

## **2. CHARACTERISTICS OF INSTRUMENTS SUPPORTING INVESTMENTS IN FARMS IN POLAND**

As part of the Polish Rural Development Programme for 2014-2020, support geared towards improving the competitiveness and farm results is the sub-measure "Modernisation of agricultural holdings". One of the eligibility conditions for the entity is the economic size of the farm measured by the Standard Output (SO) coefficients. Aid may be used by farms whose economic size is at least EUR 10 thousand, but not more than EUR 200 thousand (or EUR 250 thousand as regards the area concerning the development of piglets' production). The result indicator which must be achieved by each beneficiary using this aid is the increase in gross value added (GVA) by at least 10% in relation to the base period, while this increase should result from an investment carried out. The sub-measure is a refund of incurred investment expenses whose catalogue has been reduced by the implementing regulation to expenses incurred for the construction, reconstruction, renovation associated with modernisation of buildings or structures used for the agricultural production, purchase or costs associated with a lease contract ended with the transfer of ownership, new machinery and equipment, equipment for the agricultural production, setting up orchards or plantations of fruit bushes, species that bear fruit for more than 5 years, construction or purchase of technical infrastructure elements directly affecting the conditions of pursuing the agricultural activities (Regulation..., 2015b). Co-financing also covers general costs related to the operation, e.g. preparation of technical documentation. Support does not cover poultry rearing operations, unless it is the organic production. Another form of support, analysed in this paper, is "Premiums for young farmers". By assumption, the sub-measure is aimed at supporting innovation by addressing support to young people, aged no more than 40, with appropriate qualifications, who start managing a farm for the first time. They are characterised by a greater tendency to make investments and take related risks (RDP 2014-2020, 2018). The access requirements apply to the economic size of a farm being created, which must range from EUR 13 thousand to EUR 150 thousand of Standard Output, as well as to its area, which should be equal to at least the national average<sup>1</sup> but not larger than 300 ha. The amount of aid is PLN 100 thousand, paid in two tranches, of 80% and 20%, respectively.

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<sup>1</sup>If the farm is located in the voivodeship with average utilised agricultural area lower than the national average, then the applicable minimum area is the voivodeship average.

At least 70% of aid must be allocated for investments relating to the agricultural activities or for preparing agricultural products manufactured on the farm for sale. The remaining amount may be used for financing the current, operating activity of the farm. The beneficiary, when submitting an aid application, is also obliged to draw up a business plan of the farm in which he/she indicates the direction of the farm development and the way where the economic growth by at least 10% in relation to the starting period is to be achieved. As in the case of "Modernisation of agricultural holdings", support does not cover the non-organic poultry rearing activity (Regulation..., 2015a). Table 1 compares the major differences between the forms of support discussed.

*Table 1: Instruments supporting investments in farms (own study based on Regulation..., 2015a, Regulation..., 2015b)*

	<b>"Modernisation of agricultural holdings" RDP 2014-2020</b>	<b>"Premiums for young farmers"</b>
Boundary economic size	EUR 10 thousand – 200 thousand SO (EUR 250 thousand of SO in the area of piglets' production)	EUR 13 thousand – 150 thousand of SO
Form of support	refund of costs	bonus
Limit of support	PLN 200 thousand – basic; PLN 500 thousand – for operations covering the construction or modernisation of livestock buildings; PLN 900 thousand – for operations carried out in the area of piglets' production	PLN 100 thousand
Level of co-financing	Basic: 50% of eligible costs Co-applicants and young farmers: 60% of eligible costs	Constant amount of aid, paid in two tranches (80% and 20%)
Required increase in indicators	Increase in GVA as a result of carrying out operations, by at least 10% in relation to the base year	Increase in the economic size measured by the Standard Output coefficients, by 10% in relation to the starting period.

### 3. METHOD AND DATA

A key element in pursuing the policy, including analysed support under the Common Agricultural Policy, is to assess its implementation and to compare the results with the costs incurred. The paper considers the effect of receiving subsidies for investments on the labour productivity on the Polish farms. The method determining the standard for assessing the treatment effect of the introduced policy instrument is a fully controlled, randomised experiment (Holmes, 2014; Pan, Bai, 2015). Analysed farms are then randomly assigned to the group of support beneficiaries (experimental group) or to the group of units not receiving investment payments (control group). Where it is possible to conduct observational studies only, the one of the approaches allowing to reduce the load resulting from the selection of units for the programme is the propensity score matching method (Guo, Fraser, 2015). This method is based on the estimation of the so-called counterfactual states, and thus hypothetical values of labour productivity, if the given farm is subjected to a different treatment than in reality. The counterfactual state is the amount of labour productivity for the farm (or farms) from the control group, which is/are most similar in terms of certain observable characteristics to the analysed farm (farms) from the experimental group.

The determination of the counterfactual states enables the measurement of, e.g. the average treatment effect on the treated:

$$W_{ATT} = E(Y_{1i} - Y_{0i} | D_i = 1) = E(Y_{1i} | D_i = 1) - E(Y_{0i} | D_i = 1)$$

where:

$Y_{1i}$ ,  $Y_{0i}$  – labour productivity in the case of, respectively, subjecting (use of investment support) or not subjecting (lack of use of investment support) the  $i$ -th farm to the effect of the factor  $D_i$  – binary variable assuming the value of 1, if the  $i$ -th farm has been subjected to the effect of the factor or, otherwise, of 0.

The assessment of the counterfactual state, i.e. finding a “similar” farm from the control group requires taking account of the multidimensionality of the analysed phenomenon. Shaping of the hypothetical value of labour productivity can be affected by many factors. Rosenbaum and Rubin (1983) introduced, therefore, the term of a balancing function which is such a function of exogenous variables that with a pre-defined balancing vector the conditional distribution of observable characteristics are the same in the experimental and control groups, which allows to reduce the problem of estimating the counterfactual state to a one-dimensional issue. The simplest form of the balancing function is the function of conditional probability of subjecting the unit to the effect (cf. Sekhon, 2011):

$$b_{PS}(x_i) \equiv P(D_i = 1 | x_i) = E(D_i | x_i)$$

where:

$b_{PS}(\cdot)$  – balancing function in a form of *propensity score*,

$x_i$  – vector of observable characteristics for the  $i$ -th farm.

The objective of using the propensity score matching method is, therefore, to link the units from the experimental group with their control group counterparts based on the propensity score value. The conditional probability of subjecting the unit to the effect can be regarded as the balancing function if two assumptions, fundamental from the point of view of reducing the load of the results, are fulfilled: conditional independence assumption and overlap assumption. In the case of the controlled randomised experiment, the real propensity score vector is known. However, in the conditions of observation studies, it must be estimated, to which logistic regression is normally applied (Leite, 2017). The study used data on 3,573 individual farms, of which 52 farms received analysed support in 2016 and were assigned to the experimental group, while others were a basis for selecting the control group. For determining the pure impact of payments received in 2016 on the labour productivity, the untreated group (3,521 farms) included the units which, in 2007-2016, did not receive payments in connection with the operations “Modernisation of agricultural holdings”, “Premiums for young farmers”, “Start-up aid for non-agricultural activities”, “Restructuring of small farms”, “Investments in farms located in Natura 2000 sites”, “Investments in farms located in particularly exposed areas” and subsidies for purchase of agricultural land, for establishing permanent crops, for the construction/major renovation of land reclamation, for the construction/renovation of farm buildings and structures, under the programme “Setting up of young farmers”, for purchase/renovation of vehicles, machinery or equipment and due to participation in food quality schemes.

*Table following on the next page*

*Table 2: Characteristics of covariates in the propensity score model (own study based on Floriańczyk, Osuch, Płonka, 2015)*

Name of variable (according to FADN)	Type of variable	Characteristics
NRWOJ	nominal	voivodeships where the farm is located
TF8	nominal	farming type according to the FADN typology (categories: field crops, horticultural crops, vineyards, permanent crops, dairy cows, other grazing livestock, granivores, mixed)
ES6	ordinal	farm economic size class according to the FADN typology (categories: very small (EUR 2-8 thousand), small (EUR 8-25 thousand), medium small (EUR 25-50 thousand), medium large (EUR 50-100 thousand), large (EUR 100-500 thousand), very large (more than EUR 500 thousand))
WYK	ordinal	farmer's educational level (categories: elementary, basic non-agricultural, basic agricultural, secondary non-agricultural, secondary agricultural, higher non-agricultural, higher agricultural)
WIEK	ordinal	farmer's age (in years)
SE025	continuous	total utilised agricultural area (in ha)
SE074	continuous	total agricultural area out of production (in ha)
SE080	continuous	total livestock units (in LU)
SE265	continuous	farm use (in PLN)
SE365	continuous	total external factors (in PLN)
SE436	continuous	total assets (fixed and current) (in PLN)
SE485	continuous	total liabilities (short- and long-term) (in PLN)
SE506	continuous	change in net worth (in PLN)
SE510	continuous	average value of farm capital (in PLN)
SE516	continuous	gross investments on fixed assets (in PLN)
SE530	continuous	cash flow II (in PLN) = cash flow I + sales of fixed assets – purchases of fixed assets and investments + total liabilities at the end of the year – total liabilities at the beginning of the year

The basis for estimating propensity score, and hence the probability of treatment, was a set of selected characteristics of farms, the definitions of which are included in Table 2. What was used, was the information on the location, economic size and specialisation of the farm, age and educational level of the farm manager, the utilised agricultural area included and excluded from the production, total livestock units, farm use, total external factors, assets, liabilities, change in net worth and average value of farm capital, gross investments and cash flow II. Given the primary objective of the propensity score analysis, i.e. balancing the observable characteristics between the experimental and control groups, the selection of variables was dictated, on the one hand, by taking into account the large possible number of variables presenting the economic and financial situation of farms and, on the other, by selecting such a level of aggregation of variables, for which it will be possible to find counterfactual states for the units in the experimental group.

#### 4. RESULTS

According to the adopted objective of the study, using the propensity score matching method we measured the net treatment effect of the RDP 2014-2020 investment instruments on the labour productivity on the Polish farms in 2016. Before estimating average treatment effect we examined the balance of propensity score graphically using the histograms (see Fig. 1-3).

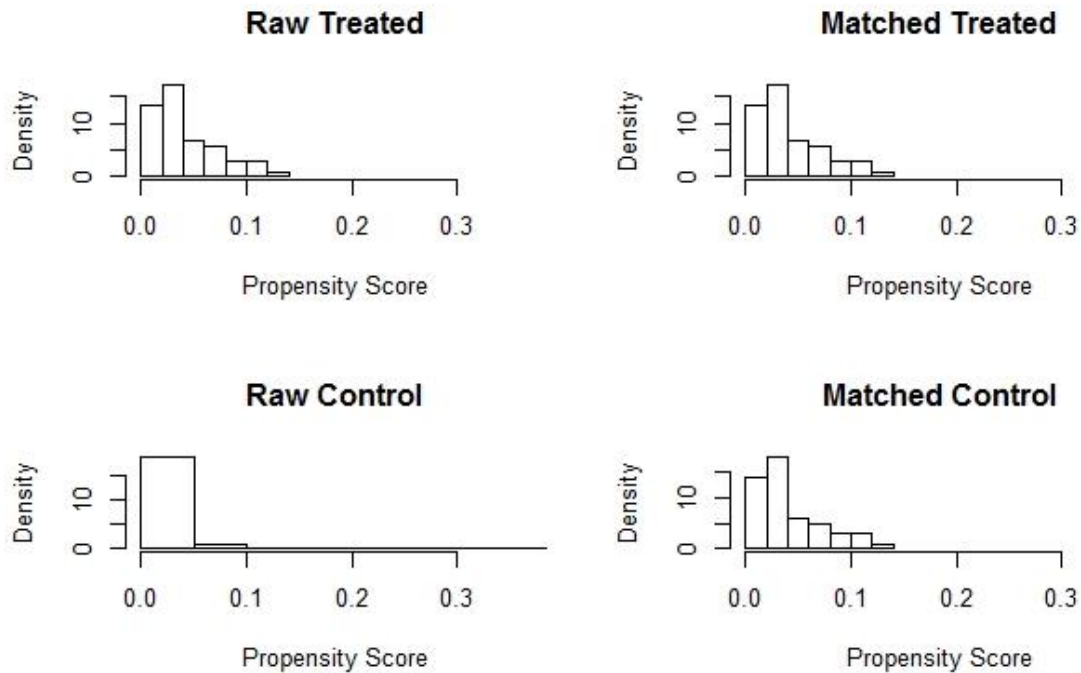


Figure 1: Distribution of propensity scores before and after the nearest neighbour matching (own study)

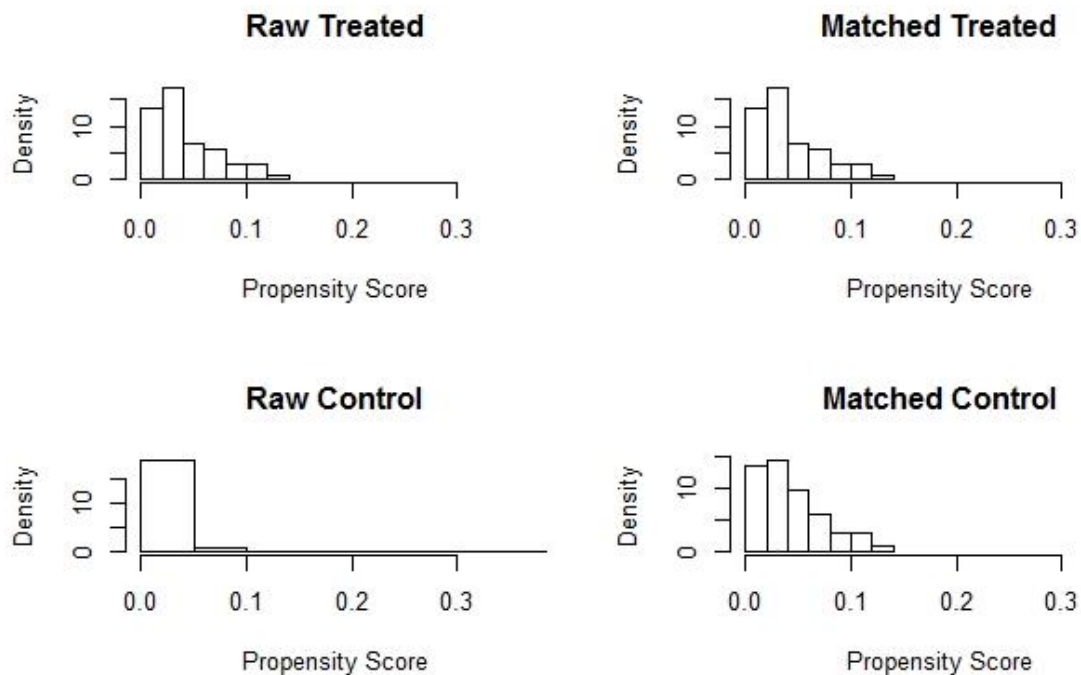


Figure 2: Distribution of propensity scores before and after optimal matching (own study)

Figure following on the next page



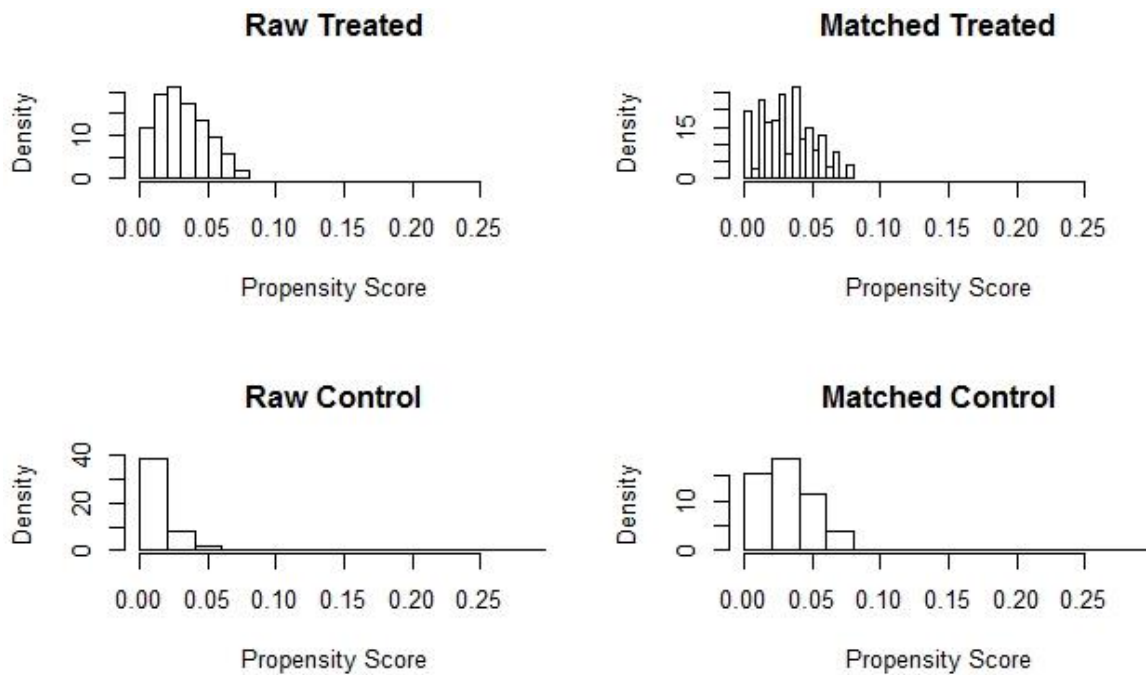


Figure 3: Distribution of propensity scores before and after full matching (own study)

For initially considered covariates, the best balance was achieved for the nearest neighbour matching. Only in case of using full matching we did not include the voivodeship in the propensity score model to obtain the satisfying balance between the experimental and control group. Finally, for all three matching methods we achieved the same distribution of covariates within the matched treated and control groups. To assess the robustness of the estimated net effect, the impact of payments on the labour productivity was measured using three matching methods: the nearest neighbour, optimal and full matching. For each type of method, the matching with replacement was used, thus one observation from the control group could be assigned to at least one unit in the experimental group. The basis for estimating propensity score was the logistic regression model. The results of the estimates are included in Table 3.

Table 3: Estimation of the average treatment effect on the treated payments for investments on the labour productivity on the Polish farms in 2016(own study)

Matching method	the nearest neighbour	optimal	full
number of treated	52	52	52
number of control	50	52	3521
mean	47,890.43	82,873.84	71,596.57
standard error	15,403.06	24,468.67	1,868.33

The nearest neighbour matching is one of the types of greedy matching, which is based on the random selection of the unit from the experimental group and choosing the best possible counterpart from the control group. It is therefore possible to divide one major decision-making problem into optimising many simple decisions on matching. However, the selection of only one observation pair is optimised at any given time, without taking account of past and future decisions on matching (Rosenbaum, 2002). The solution to the rough linking imperfections is the optimal matching. The objective of the optimal matching is, in turn, to minimise the total difference within pairs between the propensity scores in the treated and control group. Close to the optimal matching is the full matching, in which the data set is divided into subsamples, where each subsample contains one unit from the experimental group and one or more units

from the control group (or vice versa). The full matching allows for the minimisation of the weighted average distance between each experimental unit and each control unit as part of the given subsample (Guo, Fraser, 2015). For each way of matching, the positive values of the treatment effect of investment payments on the labour productivity have been obtained. However, depending of the method adopted, we may conclude on the different strength of this treatment effect, indicating a relatively high variation in the labour productivity in the very group of untreated units. The lowest net effect of investment support was achieved by matching using the nearest neighbour method. Farms which in 2016 received payments under "Modernisation of agricultural holdings" or "Premiums for young farmers" achieved the labour productivity which in this year was, on average, by PLN 47.9 thousand/AWU higher when compared to farms which did not use this support. The highest value of the treatment effect was, in turn, recorded for the optimal matching. Support for investments in farms then resulted in achieving by beneficiaries the labour productivity by about PLN 82.9 thousand/AWU when compared to control farms.

## 5. SUMMARY

Improving the competitiveness of farms is associated with the increase in the productivity of production factors. With this in mind, aid instruments are being implemented at the European Union level which, through co-financing of investments, should contribute to improving the economic situation of farms. In the current programming period in Poland, the measures to promote the productivity growth are "Modernisation of agricultural holdings" and "Premiums for young farmers". The objective of the article was to evaluate the effectiveness of investments support using the propensity score matching as the adequate method to assess the true causation effect between analysed payments and labour productivity. To assess the robustness of the estimated net effect, the impact of payments on the labour productivity was measured using three matching methods: the nearest neighbour, optimal and full matching. For each method of matching, the positive values of the treatment effect of investment payments on the labour productivity have been obtained. The lowest net effect of investment support was achieved by matching using the nearest neighbour method. Farms which in 2016 received investments support achieved the labour productivity which in this year was, on average, by PLN 47.9 thousand/AWU higher when compared to farms in the control group. The highest value of the treatment effect was, in turn, recorded for the optimal matching and equal about PLN 82.9 thousand/AWU. Therefore, the support for investments under RDP 2014-2020 had a significant positive impact on labour productivity of the Polish farms in 2016.

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# THE IMPLEMENTATION OF EUROPE 2020 STRATEGY – ATTEMPT OF EVALUATION AND RECOMMENDATIONS FOR THE FUTURE

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## ABSTRACT

*The European Union faces numerous internal and external challenges. The need for the promotion of smart, sustainable and inclusive growth was stressed by the European Commission in 2010. The targets of the Europe 2020 Strategy are ambitious and demanding. The main aim of the paper is to evaluate the so far implementation of the Europe 2020 Strategy on both national levels and EU level. Moreover, recommendations for the next decade are listed. The undertaken literature review, critical thinking, as well as comparative analysis of statistical data provided by EUROSTAT showed considerable disparities in the level of implementation of the Europe 2020 Strategy goals: some EU Member States have already managed to reach the targets, others are still far from that.*

**Keywords:** European Union, Europe 2020 Strategy, inclusive growth, smart growth, sustainable growth

## 1. INTRODUCTION

Since 2010 the European Union has been undergoing a difficult process of changes resulting from numerous internal and external challenges and threats. The list of problems that need to be solved becomes longer and longer each and every year. One should take into consideration the following aspects: considerable disparities in socio-economic development among EU Member States at both national and regional levels, unemployment including long-term unemployment and unemployment of the young, social exclusion, huge instability of public finance sector of several EU Member States, climate change, insufficient innovativeness and competitiveness. The above-mentioned challenges are strengthened by disintegration processes, in that Brexit, migrant/refugee crisis, terrorist threat, overall instability in the global environment. The global financial crisis 2008+ and its negative implications necessitated undertaking necessary steps in order to redirect the activity of the EU and EU Member States. Therefore Europe 2020 Strategy was adopted for the period 2010-2020. The Strategy should be perceived as a much wider and complex one in comparison to the Lisbon Strategy which had been implemented in the period 2000-2010. The main objective of the article is to diagnose and evaluate the so far implementation of Europe 2020 Strategy with focus on both the EU level and the level of individual Member States. The parallel objective is to create a list of recommendations for the future.

## 2. THE EUROPE 2020 STRATEGY – CRUCIAL ELEMENTS

The Europe 2020 Strategy was proposed by the European Commission in March 2010. The proposal of the European Commission resulted partly from the failure of Lisbon Strategy and partly from the wide range of negative effects of the global crisis 2008+ on the economies of EU member states. International environment changes became more and more dynamic and global challenges became more and more serious and demanding. Therefore, it became obvious for the EU leaders that structural changes were necessary if the EU were to keep its international role and position. The Europe 2020 Strategy should be perceived and treated as the basis for EU policies for the years 2010-2020 (Sulmicka, 2013). Europe 2020 Strategy focused on three priorities: smart growth, sustainable growth and inclusive growth (Czech National Bank, 2016). Smart growth priority aimed at developing an economy based on knowledge and innovation.

The second priority of Europe 2020 Strategy, i.e. sustainable growth underlined the need for strengthening and promoting sustainability of EU development. According to the 2<sup>nd</sup> priority of Europe 2020 Strategy the EU should be transformed into a green and resource efficient economy. The 3<sup>rd</sup> priority of Europe 2020 Strategy stressed the necessity to increase social inclusion, to fight poverty and social exclusion through higher employability, as well as social and territorial cohesion (European Commission, 2010a). In relation to the above described priorities, the following measurable targets were selected:

- 75 % of the population aged 20-64 should be employed;
- 3% of the EU's GDP should be invested in R&D;
- greenhouse gases emissions should be reduced by 20% compared to 1990 level;
- the share of renewable energy should constitute 20% of final energy consumption in the EU;
- energy efficiency should be increased by 20%;
- the share of early school leavers should be reduced below 10%;
- at least 40% of the younger generation (people aged 30-34 in 2020) should have a tertiary degree;
- the number of people at risk of poverty or social exclusion should be reduced by 20 million (European Commission, 2010a).

Due to the complexity and importance of the Strategy, all EU institutions got engaged in the process of its implementation (the European Commission, the European Parliament, the European Council, the Council of the EU, the European Committee of the Regions, the European Economic and Social Committee). Moreover, strong engagement of EU Member States on national, regional and local levels was necessary. The realization of the Strategy's targets was promoted by both EU budgetary sources and by the financial means of European Investment Bank (since 2015 especially through European Fund for Strategic Investment) (European Commission, 2019). In order to achieve the adopted priorities and targets, seven flagship initiatives were introduced, namely: "Innovation Union", "Youth on the move", "A digital agenda for Europe", "Resource efficient Europe", "An industrial policy for the globalisation era", "An agenda for new skills and jobs", and finally "European platform against poverty". The overall objective of "Innovation Union" flagship initiative was to improve R&D and innovation activity. Flagship initiative "Youth on the move" focused on enhancing the performance of education systems and facilitating the entry of the young to the labour market at the difficult post-crisis time. The main goal of the flagship initiative "A digital agenda for Europe" was to broaden access to high-speed Internet and to facilitate the creation of a digital single market. The next flagship initiative, namely "Resource efficient Europe" was supposed to help support the shift towards a low carbon economy, increase the use of renewable energy sources, modernise transport sector and promote more efficient use of energy. The overall objective of the flagship initiative "An industrial policy for the globalisation era" was to improve the business environment as well as to support developing sustainable industrial base. The sixth flagship initiative named "An agenda for new skills and jobs" was planned to promote lifelong education, labour mobility and modernisation of labour markets. The last flagship initiative, i.e. "European platform against poverty" focused on ensuring social and territorial cohesion, which should result in the reduction of social exclusion (European Economic and Social Committee, 2011). The above-mentioned measurable targets of the Europe 2020 Strategy should be achieved by the year 2020. It seems of vital importance to evaluate the so far implementation of the Strategy for both the EU as a whole and for each and every EU member State. The analysis was undertaken separately for employment objectives, educational objectives, research and development objectives, environmental objectives and the reduction of poverty.

### 3. LITERATURE REVIEW

Due to the huge importance of the European 2020 Strategy for the future position of the European Union in the globalised world and for the future wellbeing of the societies of the EU Member States, there have been numerous studies regarding its assumptions, targets and their implementation. Kedaitis and Kedaitiene (2014) studied external dimension of the Europe 2020 Strategy and pointed out to the possible positive effects of stronger internationalisation and opening of the economies of the EU Member States on the level of implementation of the Europe 2020 Strategy. Drăcea, Dobre and Cîrstea (2014) focused on the analysis of the R&D element of the Europe 2020 Strategy and indicated the importance of knowledge and its contribution to a developed society. Argyropoulou, Soderquist and Ioannou (2019) evaluated the existing gaps and contradictions in the way of understanding the situation of the European R&D and innovation system; moreover, they discussed the possible scenarios regarding the creation of the truly diverse and effective European research and innovation system that could and would promote competitive advancement. Andersen (2018) described the European research environment and its relations and interactions with national and regional structures and financial instruments and mechanisms. The progress in the implementation of the broadband targets was studied by Feijóo, Ramos, Armuña, Arenal and Gómez-Barroso (2018). Lutz (2018) evaluated the dynamics of the creation of the European single market with Focus on the frequency of Internet and e-commerce use. Janger, Schubert, Andries, Rammer, Hoskens (2017) discussed the innovation element of the Europe 2020 Strategy and focused mostly on old and new ways of measuring innovation outputs and outcomes. The implementation of the Europe 2020 Strategy tertiary education target was studied by Dragomirescu-Gaina, Elia and Weber (2015) who indicated a growing divide between the best and the worst performing countries and pointed out to limited Chance for real economic convergence. Cotoi, Bodoasca, Catana and Cotoi (2011) indicated the necessity for decisive creation and promotion of entrepreneurship skills through education process. Panitsidou, Griva and Chostelidou (2012) pointed out to the need for lifelong learning promotion through EU policies. The employment objective of the Europe 2020 Strategy was studied by Pařová and Vejačka (2018). Kukuła (2017) analysed the chances for meeting the Europe 2020 Strategy challenges including the employment target. Sustainable development and the reasons for dynamic and effective implementation of the climate targets were analysed by Klessmann, Held, Rathmann and Ragwit (2011). Koukios, Monteleone, Carrondo, Charalambous and Zabaniotou (2018) advocated the adoption of a new development model, focusing on the target of sustainable bio-economy, the implementation of which could serve as a locomotive of getting the economies and societies of Portugal, Spain, Italy, Greece and Cyprus out of the prolonged crisis. Cross, Hast, Kuhi-Thalfeldt, Syri and Denina (2015) focused on the process of renewable electricity development in the Nordic-Baltic countries (Sweden, Finland, Lithuania, Latvia and Estonia). Climate change adaptation strategies were also studied by Galderisi and Treccozzi (2018) and Bel and Joseph (2018). The development of renewable energy sources use, as a strategic action aiming to limit climate changes and cut greenhouse gas emissions was evaluated by D'Adamo and Rosa (2016). The research undertaken by Moreno and García-Álvarez (2018) concentrated on the issue of resource efficiency as an essential priority of the Europe 2020 Strategy, with particular attention given on calls for a shift towards a resource-efficient economy. Liobikiene and Butkus (2017) indicated correlation and dependencies between the environmental targets of the Europe 2020 Strategy and the Paris Agreement targets. Aguiar, Bentz, Silva, Fonseca and Penha-Lopes (2018) focused on local level of adaptation strategies to climate change as exemplified by selected examples. Zsolt (2019) looked closer at the reasons for such considerable difficulties in reaching the poverty target of the Europe 2020 Strategy. The possible ways for promoting social inclusion through more technically advanced education was described by Serrano, Suarez-Figueroa and Gonzalez-Pachon (2019).

Social inclusion lied in the centre of research interest of Schoukens, De Becker and Beke Smets (2015), who indicated the need for two-way dependence between social inclusion goals and employment objectives. Similarities and differences among EU Member States regarding the so far implementation of the Europe 2020 Strategy have been studied by Szymańska and Zalewska (2018), as well as Pawlas (2016). Dobrovic, Gallo and Mihalцова (2018) focused on competitiveness measurement in the context of the Europe 2020 Strategy. Priede and Neuert (2015) evaluated competitiveness gap of the European Union Member Countries in the context of the Europe 2020 Strategy. Sanchez and Ruiz-Martos (2018) made an attempt to assess whether the policy action introduced in accordance with the Europe 2020 Strategy could and would increase citizens' life satisfaction.

#### **4. THE PROCESS OF THE EUROPE 2020 STRATEGY IMPLEMENTATION**

Council of the European Union formulated ten recommendations in 2010. The recommendations aimed at assisting in practical implementation of the Strategy. The Europe 2020 Integrated Guidelines included: ensuring the quality and the sustainability of public finance, addressing macroeconomic imbalances, reducing imbalances in the euro area, optimising support for R&D and innovation, strengthening the knowledge triangle and unleashing the potential of the digital economy, improving resource efficiency and reducing greenhouse gases emissions, improving the business and consumer environment and modernising the industrial base, increasing labour market participation and reducing structural unemployment, developing a skilled workforce responding to labour market needs, promoting job quality and lifelong learning, improving the performance of education and training systems at all levels and increasing participation in tertiary education, promoting social inclusion and combating poverty (European Commission, 2010b). EU Member States were supposed to take into consideration the above listed guidelines in the implementation of their economic policies and the development of national reform programmes (Council, 2010). In 2015 the decisions were made by the EU institutions to introduce some changes in the recommendations addressed to the EU Member States regarding the implementation of the Europe 2020 Strategy. The following guidelines were introduced: boosting investment, enhancing growth by the implementation of structural reforms, removing key barriers to growth and jobs at Union level, boosting demand for labour, enhancing labour supply and skills, enhancing the functioning of labour markets, as well as ensuring fairness, combating poverty and promoting equal opportunities (European Commission, 2015).

##### **4.1. Implementation of the employment objectives**

Increasing the level of employment constitutes one of the most significant goals of the Europe 2020 Strategy. National targets regarding employment rate and actual employment rates in individual EU Member States and in the EU for the period 2010-2017 were presented in table 1. Huge disparities in employment among the EU MS were reflected in different national targets regarding employment rate. The national targets ranged from 62.9% for Croatia and 67% for Italy to as much as 80% for Denmark, the Netherlands and Sweden. Till the year 2017 the targets regarding employment rate were achieved by nine EU member States only, including three old EU Member States, i.e. Germany, Sweden and Ireland and six new EU Member States, namely: Czechia, Estonia, Croatia, Latvia, Lithuania and Malta.

*Table following on the next page*

*Table 1: Employment rate, age group 20-64 years (%) (Eurostat, 2019, own calculations, own elaboration)*

Economy	2010	2011	2012	2013	2014	2015	2016	2017	Target	2010-2017 Change	Distance to target (-) / Surplus over target (+)	Target achieved
EU28	68.6	68.6	68.4	68.4	69.2	70.1	71.1	72.2	75	3.6	-2.8	
Belgium	67.6	67.3	67.2	67.2	67.3	67.2	67.7	68.5	73.2↓	0.9	-4.7	
Bulgaria	64.7	62.9	63.0	63.5	65.1	67.1	67.7	71.3	76↑	6.6	-8.3	
Czechia	70.4	70.9	71.5	72.5	73.5	74.8	76.7	78.5	75	8.1	3.5	X
Denmark	75.8	75.7	75.4	75.6	75.9	76.5	77.4	76.9	80↑	1.1	-3.1	
Germany	75.0	76.5	76.9	77.3	77.7	78.0	78.6	79.2	77↑	4.2	2.2	X
Estonia	66.8	70.6	72.2	73.3	74.3	76.5	76.6	78.7	76↑	11.9	2.7	X
Ireland	65.5	64.6	64.5	66.5	68.1	69.9	71.4	73.0	69↓	7.5	4.0	X
Greece	63.8	59.6	55.0	52.9	53.3	54.9	56.2	57.8	70	-6.0	-12.2	
Spain	62.8	62.0	59.6	58.6	59.9	62.0	63.9	65.5	74↓	2.7	-8.5	
France	l. d.	l. d.	l. d.	l. d.	69.2	69.5	70.0	70.6	75	l. d.	-4.4	
Croatia	62.1	59.8	58.1	57.2	59.2	60.6	61.4	63.6	62.9↓	1.5	0.7	X
Italy	61.0	61.0	60.9	59.7	59.9	60.5	61.6	62.3	67↓	1.3	-4.7	
Cyprus	75.0	73.4	70.2	67.2	67.6	67.9	68.7	70.8	75	-4.2	-4.2	
Latvia	64.3	66.3	68.1	69.7	70.7	72.5	73.2	74.8	73↓	10.5	1.8	X
Lithuania	64.3	66.9	68.5	69.9	71.8	73.3	75.2	76.0	72.8↓	11.3	3.2	X
Luxembourg	70.7	70.1	71.4	71.1	72.1	70.9	70.7	71.5	73↓	0.8	-1.5	
Hungary	59.9	60.4	61.6	63.0	66.7	68.9	71.5	73.3	75	13.4	-1.5	
Malta	60.1	61.6	63.9	66.2	67.9	69.0	71.1	73.0	70↓	12.9	3.0	X
Netherlands	76.8	76.4	76.6	75.9	75.4	76.4	77.1	78.0	80↑	1.2	-2.0	
Austria	73.9	74.2	74.4	74.6	74.2	74.3	74.8	75.4	77↑	1.5	-1.6	
Poland	64.3	64.5	64.7	64.9	66.5	67.8	69.3	70.9	71↓	6.6	-0.1	
Portugal	70.3	68.8	66.3	65.4	67.6	69.1	70.6	73.4	75	3.1	-1.6	
Romania	64.8	63.8	64.8	64.7	65.7	66.0	66.3	68.8	70↓	4.0	-1.2	
Slovenia	70.3	68.4	68.3	67.2	67.7	69.1	70.1	73.4	75	3.1	-1.6	
Slovakia	64.6	65.0	65.1	65.0	65.9	67.7	69.8	71.1	72↓	6.5	-0.9	
Finland	73.0	73.8	74.0	73.3	73.1	72.9	73.4	74.2	78↑	1.2	-3.8	
Sweden	78.1	79.4	79.4	79.8	80.0	80.5	81.2	81.8	80↑	3.7	1.8	X
United Kingdom	73.5	73.5	74.1	74.8	76.2	76.8	77.5	78.2	l. d.	l. d.	l. d.	

↓ - national target below the target for the EU; ↑ - national target above the target for the EU

In 2017 the highest distance to target was observed in the case of Greece: minus 12.2%. Moreover, the gap to the Greek target widened over the analyzed period of time by as much as 6% points, which means that the situation on the market of labour in Greece became much worse than it was in 2010. A considerable distance to the employment target was also noted in the case of Bulgaria (minus 8.1% points) and Spain (minus 8.5% points). The highest surplus over target was characteristic for Ireland (plus 4%). It is worth mentioning here that also Czechia and Lithuania managed to achieve a considerable surplus over the employment targets (amounting to 3.5% and 3.2% respectively). Employment rate in the EU28 increased from 68.6% in 2010 to 72.2% in 2017, which means the EU did not manage to meet the goal: its distance to the target relating employment rate amounted to minus 2.8% points in 2017.

#### 4.2. The educational objectives and their implementation

Well-functioning educational system constitutes one of crucial determinants of economic development. Better educated society was put in the centre of both the 1<sup>st</sup> Priority and the 3<sup>rd</sup> Priority of the Europe 2020 Strategy. The EU Member States agreed it was necessary to reduce school drop-out rates and to promote higher education (tertiary education).



*Table 2: Early school leavers (Eurostat, 2019, own calculations, own elaboration)*

Economy	2010	2011	2012	2013	2014	2015	2016	2017	2018	Target	2010-2018 Change	Distance to target (-) / Surplus over target (+)	Target achieved
EU28	13.9	13.4	12.7	11.9	11.2	11.0	10.7	10.6	10.6	10	-3.3	-0.6	
Belgium	11.9	12.3	12.0	11.0	9.8	10.1	8.8	8.9	8.6	9.5↑	-3.3	0.9	X
Bulgaria	12.6	11.8	12.5	12.5	12.9	13.4	13.8	12.7	12.4	11↓	-0.2	-1.4	
Czechia	4.9	4.9	5.5	5.4	5.5	6.2	6.6	6.7	6.4	5.5↑	1.5	-0.9	
Denmark	11.0	9.6	9.1	8.0	7.8	7.8	7.2	8.8	9.8	10	-1.2	0.2	X
Germany	11.8	11.6	10.5	9.8	9.5	10.1	10.3	10.1	10.4	10	-1.4	-0.4	
Estonia	11.0	10.6	10.3	9.7	12.0	12.2	10.9	10.8	11.5	9.5↑	0.5	-2.0	
Ireland	11.9	11.1	9.9	8.7	6.7	6.8	6.0	5.0	4.7	8↑	-7.2	3.3	X
Greece	13.5	12.9	11.3	10.1	9.0	7.9	6.2	6.0	4.9	10	-8.6	5.1	X
Spain	28.2	26.3	24.7	23.6	21.9	20.0	19.0	18.3	18.3	15↓	-9.9	-3.3	
France	12.7	12.3	11.8	9.7	8.8	9.2	8.8	8.9	9.0	9.5↑	-3.7	0.5	X
Croatia	5.2	5.0	5.1	4.5	2.8	2.8	2.8	3.1	3.1	4↑	-2.1	0.9	X
Italy	18.6	17.8	17.3	16.8	15.0	14.7	13.8	14.0	14.5	16↓	-4.1	1.5	X
Cyprus	12.7	11.3	11.4	9.1	6.8	5.2	7.6	8.5	7.9	10	-4.8	2.1	X
Latvia	12.9	11.6	10.6	9.8	8.5	9.9	10.0	8.6	8.0	10	-4.9	2.0	X
Lithuania	7.9	7.4	6.5	6.3	5.9	5.5	4.8	5.4	4.8	9↑	-3.1	4.2	X
Luxembourg	7.1	6.2	8.1	6.1	6.1	9.3	5.5	7.3	6.4	10	-0.7	3.6	X
Hungary	10.8	11.4	11.8	11.9	11.4	11.6	12.4	12.5	12.4	10	1.6	-2.4	
Malta	23.8	22.7	21.7	20.8	20.9	20.2	19.2	17.7	17.5	10	-6.3	-7.5	
Netherlands	10.1	9.2	8.9	9.3	8.7	8.2	8.0	7.1	7.4	8↑	-2.7	0.6	X
Austria	8.3	8.5	7.8	7.5	7.0	7.3	6.9	7.4	7.2	9.5↑	-1.1	2.3	X
Poland	5.4	5.6	5.7	5.6	5.4	5.3	5.2	5.0	4.7	4.5↑	-0.7	-0.2	
Portugal	28.3	23.0	20.5	18.9	17.4	13.7	14.0	12.6	12.0	10	-16.3	-2.0	
Romania	19.3	18.1	17.8	17.3	18.1	19.1	18.5	18.1	16.9	11.3↓	-2.4	-5.6	
Slovenia	5.0	4.2	4.4	3.9	4.4	5.0	4.9	4.3	4.0	5↑	-1.0	1.0	X
Slovakia	4.7	5.1	5.3	6.4	6.7	6.9	7.4	9.3	9.1	6↑	4.4	-3.1	
Finland	10.3	9.8	8.9	9.3	9.5	9.2	7.9	8.2	8.4	8↑	-1.9	-0.4	
Sweden	6.5	6.6	7.5	7.1	6.7	7.0	7.4	7.7	8.7	7↑	2.2	-1.7	
United Kingdom	14.8	14.9	13.4	12.4	11.8	10.8	11.2	10.6	10.6	1. d.	1. d.	1. d.	

↓ - national target below the target for the EU; ↑ - national target above the target for the EU; 2018 – provisional data

Again, due to huge disparities among the EU Member States national targets regarding early school drop-out rates differed a lot: from only 4% in Croatia and 4.5% in Poland to as much as 16% in Italy and 15% in Spain. The gradual changes in terms of early leavers from education in the EU and in individual EU Member States from 2010 to 2018 were shown in table 2. As far as the EU level is concerned, school drop-out rate was reduced by 3.3% points (from 13.9% in 2010 to 10.6% in 2018); the EU did not manage to achieve the goal though the distance to the target amounted to just 0.6% point in 2017. It is worth mentioning here that fourteen EU Member States did achieve the target in 2017. Quite surprisingly the highest surplus over the target was noted in the case of Greece (plus 5.1% points). The possible reason for such a tendency was a really bad situation on the market of labour which – probably – stimulated rising schooling ratio. Considerable surpluses over the targets were also observed in the case of Lithuania (plus 4.2% points) and Ireland (plus 3.3% points). In 2018 the school drop-out rate was reduced below 5% level in six EU member States, namely: Ireland (4.7%), Greece (4.9%), Lithuania (4.8%), Croatia (3.1%), Slovenia (4.0%) and Poland (4.7%). The intensity of higher education was quite high in some EU Member States already in 2010, while in other EU Member States tertiary education was much, much less popular then. Therefore, again, one could observe considerable disparities regarding the tertiary education targets and their implementation.

In the case of eleven EU Member States the tertiary education targets were higher than for the EU as whole, while in the case of ten EU Member States they were lower than for the EU as a whole.

*Table 3: Tertiary education (Eurostat, 2019, own calculations, own elaboration)*

Economy	2010	2011	2012	2013	2014	2015	2016	2017	2018	Target	2010-2018 Change	Distance to target (-) / Surplus over target (+)	Target achieved
EU28	33.8	34.8	36.0	37.1	38.0	38.7	39.2	39.9	40.5	40	6.7	0.5	X
Belgium	44.4	42.6	43.9	42.7	43.8	42.7	45.6	45.9	46.9	47↑	2.5	-0.1	
Bulgaria	28.0	27.3	26.9	29.4	30.9	32.1	33.8	32.8	33.7	36↓	5.7	-2.3	
Czechia	20.4	23.7	25.6	26.7	28.2	30.1	32.8	34.2	33.5	32↓	13.1	1.5	X
Denmark	41.2	41.2	43.0	43.4	44.9	47.6	47.7	48.8	48.8	40	7.6	8.8	X
Germany	29.7	30.6	31.8	32.9	31.4	32.3	33.2	34.0	34.8	42↑	5.1	-7.2	
Estonia	40.2	40.2	39.5	42.5	43.2	45.3	45.4	48.4	47.6	40	7.4	7.6	X
Ireland	51.4	51.0	52.2	53.6	54.6	53.8	54.6	54.5	55.4	60↑	4.0	-4.6	
Greece	28.6	29.1	31.2	34.9	37.2	40.4	42.7	43.7	44.4	32↓	15.8	12.4	X
Spain	42.0	41.9	41.5	42.3	42.3	40.9	40.1	41.2	41.9	44↑	-0.1	-2.1	
France	43.2	43.1	43.3	44.0	43.7	45.0	43.6	44.3	45.5	50↑	2.3	-4.5	
Croatia	24.5	23.9	23.1	25.6	32.1	30.8	29.3	28.7	32.5	35↓	8.0	-2.5	
Italy	19.9	20.4	21.9	22.5	23.9	25.3	26.2	26.9	27.9	26↓	8.0	1.9	X
Cyprus	45.3	46.2	49.9	47.8	52.5	54.5	53.4	55.9	57.1	46↑	11.8	11.1	X
Latvia	32.6	35.9	37.2	40.7	39.9	41.3	42.8	43.8	42.8	34↓	10.2	8.8	X
Lithuania	43.8	45.7	48.6	51.3	53.3	57.6	58.7	58.0	57.6	48.7↑	13.8	8.9	X
Luxembourg	46.1	48.2	49.6	52.5	52.7	52.3	54.6	52.7	54.7	66↑	8.6	-11.3	
Hungary	26.1	28.2	29.8	32.3	34.1	34.3	33.0	32.1	33.4	34↓	7.3	-0.6	
Malta	22.1	23.4	26.3	28.7	28.6	29.1	32.0	33.5	33.9	33↓	11.8	0.9	X
Netherlands	41.4	41.2	42.2	43.2	44.8	46.3	45.7	47.9	49.2	40	7.8	9.2	X
Austria	23.4	23.6	26.1	27.1	40.0	38.7	40.1	40.8	40.7	38↓	17.3	2.7	X
Poland	34.8	36.5	39.1	40.5	42.1	43.4	44.6	45.7	45.5	45↑	10.7	0.5	X
Portugal	24.0	26.7	27.8	30.0	31.3	31.9	34.6	33.5	33.1	40	9.1	-6.9	
Romania	18.3	20.3	21.7	22.9	25.0	25.6	25.6	26.3	24.9	26.7↓	6.6	-1.8	
Slovenia	34.8	37.9	39.2	40.1	41.0	43.4	44.2	46.4	43.5	40	8.7	3.5	X
Slovakia	22.1	23.2	23.7	26.9	26.9	28.4	31.5	34.3	36.8	40	14.1	-3.2	
Finland	45.7	46.0	45.8	45.1	45.3	45.5	46.1	44.6	44.0	42↑	-1.7	2.0	X
Sweden	45.3	46.8	47.9	48.3	49.9	50.2	51.0	51.3	52.2	45↑	6.9	7.2	X
United Kingdom	43.1	45.5	46.9	47.4	47.7	47.9	48.2	48.3	48.9	l. d.	5.8	l. d.	

↓ - national target below the target for the EU; ↑ - national target above the target for the EU; 2018 – provisional data

The highest level of the tertiary education target was set for Luxembourg and Ireland (66% and 60% respectively). As far as the lowest levels of the tertiary education targets are concerned one should mention the following two EU Member States: Italy (26%) and Romania (26.7%). The analysis of the implementation of the tertiary education targets from 2010 to 2018 pointed out to the fact of meeting the goal by fifteen EU Member States and by the EU as a whole. In 2018 the highest levels of the tertiary education intensity amounting to over 57% were observed in Cyprus and Lithuania. On the other hand, the highest advancement regarding the tertiary education target was observed in the case of Austria (increase by 17.3% points up to the level of 40.7%). Moreover, one should note the fact that in Greece tertiary education ratio increased by 15.8% points which resulted not only in reaching the target but also in quite considerable surplus over the target amounting to as much as 12.4% points. A relatively bad situation regarding the tertiary education in 2018 was observed in Romania (it increased its tertiary education level by 6.6% points and reached 24.9% in 2018 which was not enough to meet the target set on the level of 26.7%).

#### **4.3. Implementation of the R&D objectives**

The need to transform the EU into a more competitive economy based on knowledge and innovation was included in the 1<sup>st</sup> Priority of the Europe 2020 Strategy. In order to be able to significantly raise innovativeness and competitiveness of the EU and its Member States, a considerable increase of gross expenditure on R&D (GERD) was required. Due to huge national disparities in the so far R&D investment levels, different national targets were set in regard to GERD (% GDP). Both the national targets regarding GERD and the implementation of R&D objectives in all EU Member States and in the EU for the period 2010 - 2017 were presented in table 4. National R&D targets ranged from 0.5% GDP (in the case of Malta) to 3.76% GDP (in the case of Austria) and 4% GDP (in the case of Finland and Sweden. It should be underlined here that for eighteen EU Member States R&D national targets were lower than the one for the EU as a whole, while only for three of them R&D national targets were higher than the R&D target for the EU as a whole. The implementation of the R&D target for the EU from 2010 to 2017 was not satisfactory: GERD increased from 1.92% GDP to 2.06%, which means that in 2017 there was still a considerable distance to the R&D target amounting to 0.94% GDP. Unfortunately, only three EU Member States achieved the national R&D targets set for them, namely: Denmark (3.05% GDP in 2017 versus 2.92% GDP in 2010 and 3.0% GDP as the national target), Germany (3.02% GDP in 2017 versus 2.71% GDP in 2010 and 3.0% GDP as the national target) and Czechia (1.79% GDP in 2017 versus 1.34 % GDP in 2010 and 1.79% GDP as the national target). All those three EU Member States not only achieved the R&D targets but also managed to create some surplus over the targets. Moreover, one should underline relatively high levels of GERD in 2017 in: Sweden (3.40% GDP), Austria (3.16% GDP in 2017) and Finland (2.76% GDP) in comparison to majority of other EU Member States, even though the national R&D targets were not achieved in the above-mentioned countries. Due to the fact that the R&D target for the EU amounting to 3% GDP was set already in the Lisbon Strategy with 2010 as the initial deadline, the existing level of GERD in the EU in 2017 was very much disappointing; undoubtedly it did show the weakness of the EU and its low potential for creating higher innovativeness and higher and stronger competitive advantage. It seems obvious therefore, that much stronger measures and much more decisive steps should be taken in the near future.

*Table following on the next page*

*Table 4: R&D expenditure (% GDP) (Eurostat, 2019, own calculations, own elaboration)*

Economy	2010	2011	2012	2013	2014	2015	2016	2017	Target	2010-2017 Change	Distance to target (-)/ Surplus over target (+)	Target achieved
EU28	1.92	1.97	2.00	2.02	2.03	2.04	2.04	2.06	3.0	0.14	-0.94	
Belgium	2.05	2.16	2.27	2.33	2.39	2.46	2.55	2.58	3.0	0.53	-0.42	
Bulgaria	0.56	0.53	0.60	0.64	0.79	0.96	0.78	0.75	1.5↓	0.19	-0.75	
Czechia	1.34	1.56	1.78	1.90	1.97	1.93	1.68	1.79	1.0↓	0.45	0.79	X
Denmark	2.92	2.94	2.98	2.97	2.91	3.06	3.10	3.05	3.0	0.13	0.05	X
Germany	2.71	2.80	2.87	2.82	2.87	2.91	2.92	3.02	3.0	0.31	0.02	X
Estonia	1.58	2.31	2.12	1.72	1.43	1.47	1.25	1.29	3.0	-0.29	-1.71	
Ireland	1.59	1.56	1.56	1.56	1.50	1.19	1.19	1.05	2.0↓	-0.54	-0.95	
Greece	0.60	0.67	0.70	0.81	0.83	0.96	0.99	1.13	1.2↓	0.53	-0.07	
Spain	1.35	1.33	1.29	1.27	1.24	1.22	1.19	1.20	2.0↓	-0.15	-0.80	
France	2.18	2.19	2.23	2.24	2.23	2.27	2.25	2.19	3.0	0.01	-0.81	
Croatia	0.74	0.75	0.75	0.81	0.78	0.84	0.86	0.86	1.4↓	0.12	-0.54	
Italy	1.22	1.21	1.27	1.31	1.34	1.34	1.37	1.35	1.53↓	0.13	-0.18	
Cyprus	0.45	0.46	0.44	0.48	0.51	0.48	0.53	0.56	0.5↓	0.11	0.06	
Latvia	0.61	0.70	0.66	0.61	0.69	0.63	0.44	0.51	1.5↓	-0.10	-0.99	
Lithuania	0.78	0.90	0.89	0.95	1.03	1.04	0.84	0.89	1.9↓	0.11	-1.01	
Luxembourg	1.50	1.46	1.27	1.30	1.26	1.28	1.30	1.26	2.3↓	-0.24	-1.04	
Hungary	1.14	1.19	1.26	1.39	1.35	1.36	1.20	1.35	1.8↓	0.21	-0.45	
Malta	0.61	0.67	0.83	0.77	0.71	0.74	0.57	0.54	2.0↓	-0.07	-1.46	
Netherlands	1.70	1.88	1.92	1.93	1.98	1.98	2.00	1.99	2.5↓	0.29	-0.51	
Austria	2.73	2.67	2.91	2.95	3.08	3.05	3.13	3.16	3.76↑	0.43	-0.60	
Poland	0.72	0.75	0.88	0.87	0.94	1.00	0.96	1.03	1.7↓	0.31	-0.67	
Portugal	1.53	1.46	1.38	1.33	1.29	1.24	1.28	1.33	2.7↓	-0.2	-1.37	
Romania	0.46	0.50	0.48	0.39	0.38	0.49	0.48	0.50	2.0↓	0.04	-1.50	
Slovenia	2.06	2.42	2.57	2.58	2.37	2.20	2.01	1.86	3.0	-0.20	-1.14	
Slovakia	0.62	0.66	0.80	0.82	0.88	1.17	0.79	0.88	1.2↓	0.26	-0.32	
Finland	3.73	3.64	3.42	3.29	3.17	2.89	2.74	2.76	4.0↑	-0.97	-1.24	
Sweden	3.21	3.25	3.28	3.30	3.14	3.26	3.27	3.40	4.0↑	0.19	-0.60	
United Kingdom	1.66	1.66	1.59	1.64	1.66	1.67	1.68	1.66	1. d.	0.00	1. d.	

↓ - national target below the target for the EU; ↑ - national target above the target for the EU

#### 4.4. The environmental objectives and their implementation

In the beginning of the 21<sup>st</sup> century climate change and raw materials' shortages constituted unquestionable global problems and created true and real challenges for future development of European economies and societies. There's no time to lose. The EU simply had to undertake serious measures, steps and actions regarding environmental protection. Therefore, sustainability of development appeared in Europe 2020 Strategy as its 2<sup>nd</sup> Priority. Shares of renewable energy in gross final energy consumption in the EU and in individual EU Member States were presented in table 5, while greenhouse gas emissions levels for the EU and EU Member States were shown in table 6. As far as the share of renewable energy sources in final energy consumption is concerned, national targets ranged from only 10% in Malta and 11% in Luxembourg to as much as 49% in Sweden and 40% in Latvia. The national targets below the EU target were set for fifteen EU Member States, while in the case of eleven EU Member States the national targets levels were lower than the EU target. The analysis of situation in 2016 pointed out to the fact that the target relating to the share of renewable energy sources in final energy consumption was achieved by ten EU Member States, while eighteen EU Member States were still far from meeting the challenge regarding renewable energy sources' usage. The biggest advancement between 2010 and 2016 was noted in Denmark (in 2010 renewable energy sources accounted for 22.1% of final energy consumption in Denmark, while in 2016 they stood for 32.2%, i.e. 2.2% points over the target set for Denmark).

The lowest shares of renewable energy sources in final energy consumption were observed in Malta and – quite surprisingly – in the Netherlands. The situation in the two EU member States, however, was not the same. When it comes to Malta an increase by 5% points was noted (from 1% in 2010 to 6% in 2016), which meant reducing the distance to the target to 4% points). On the other hand, in the case of the Netherlands one could observe only a marginal increase of the share of renewable energy sources in final energy consumption (from 3.9% in 2010 to 6% in 2016, which meant the reduction of the distance to the target by 2.1% points only). In 2016 the distance to the Dutch target still amounted to 8.0% points. A higher level of the distance to the renewable energy sources target was characteristic for Croatia only. Moreover, it is worth underlining here that Sweden increased the share of renewable energy sources in final energy consumption to as much as 53.8% in 2016, which means Sweden not only achieved its renewable energy sources target but it also noted a 4.8% points surplus over the target. As far as the EU as a whole is concerned one should note an increase of the share of renewable energy sources in final energy consumption from 12.9% in 2010 to 17% in 2016. Therefore, the distance to the target was reduced to 3.0% points in 2016. Considerable reduction of greenhouse gases emissions constituted another important aspect of sustainable development. The EU agreed to decrease the level of greenhouse gases emissions by 20% in comparison to the 1990 level. The EU managed to reduce the level of greenhouse gases emissions by 8.19% points from 2010 to 2016 and to achieve the adopted target.

*Table 5: Share of renewable energy sources in final energy consumption (%) (Eurostat, 2019, own calculations, own elaboration)*

Economy	2010	2011	2012	2013	2014	2015	2016	Target	2010-2016 Change	Distance to target (-)/ Surplus over target (+)	Target achieved
EU28	12.9	13.2	14.4	15.2	16.1	16.7	17.0	20	4.1	-3.0	
Belgium	5.7	6.3	7.2	7.5	8.0	7.9	8.7	13↓	3.0	-4.3	
Bulgaria	14.1	14.3	16.0	19.0	18.0	18.2	18.8	16↓	4.7	2.8	X
Czechia	10.5	10.9	12.8	13.8	15.0	15.0	14.9	13↓	4.4	1.9	X
Denmark	22.1	23.5	25.7	27.4	29.6	31.0	32.2	30↑	10.1	2.2	X
Germany	10.5	11.4	12.1	12.4	13.8	14.6	14.8	18↓	4.3	-3.2	
Estonia	24.6	25.5	25.8	25.6	26.3	28.6	28.8	25↑	4.2	3.8	X
Ireland	5.7	6.5	7.1	7.7	8.7	9.2	9.5	16↓	3.8	-6.5	
Greece	9.8	10.9	13.5	15.0	15.3	15.3	15.2	18↓	5.4	-2.8	
Spain	13.8	13.2	14.3	15.3	16.1	16.2	17.3	20	3.5	-2.7	
France	12.7	11.1	13.4	14.1	14.7	15.1	16.0	23↑	3.3	-7.0	
Croatia	25.1	25.4	26.8	28.0	27.8	29.0	28.3	20	3.2	8.3	X
Italy	13.0	12.9	15.4	16.7	17.1	17.5	17.4	17↓	4.4	0.4	X
Cyprus	6.0	6.0	6.8	8.1	8.9	9.4	9.3	13↓	3.3	-3.7	
Latvia	30.4	33.5	35.7	37.1	38.7	37.6	37.2	40↑	6.8	-2.8	
Lithuania	19.6	19.9	21.4	22.7	23.6	25.8	25.6	23↑	6.0	2.6	X
Luxembourg	2.9	2.9	3.1	3.5	4.5	5.0	5.4	11↓	2.5	-5.6	
Hungary	12.7	14.0	15.5	16.2	14.6	14.4	14.2	13↓	1.5	1.2	X
Malta	1.0	1.9	2.8	3.7	4.7	5.0	6.0	10↓	5.0	-4.0	
Netherlands	3.9	4.5	4.7	4.8	5.5	5.8	6.0	14↓	2.1	-8.0	
Austria	30.2	30.6	31.5	32.4	33.0	32.8	33.5	34↑	3.3	-0.5	
Poland	9.3	10.3	10.9	11.4	11.5	11.7	11.3	15↓	2.0	-3.7	
Portugal	24.2	24.6	24.6	25.7	27.0	28.0	28.5	31↑	4.3	-2.5	
Romania	23.4	21.4	22.8	23.9	24.8	24.8	25.0	24↑	1.6	1.0	X
Slovenia	20.4	20.3	20.8	22.4	21.5	21.9	21.3	25↑	0.9	-3.7	
Slovakia	9.1	10.3	10.4	10.1	11.7	12.9	12.0	14↓	2.9	-2.0	
Finland	32.4	32.8	34.4	36.7	38.7	39.2	38.7	38↑	6.3	0.7	X
Sweden	47.2	48.8	51.1	52.0	52.5	53.8	53.8	49↑	6.6	4.8	X
United Kingdom	3.7	4.2	4.6	5.7	7.0	8.5	9.3	15↓	5.6	-5.7	

↓ - national target below the target for the EU; ↑ - national target above the target for the EU

*Table 6: Greenhouse gas emissions (1990=100) (Eurostat, 2019, own calculations, own elaboration)*

Economy	2010	2011	2012	2013	2014	2015	2016	2010-2016 Change	Target achieved
EU28	85.83	83.13	82	80.36	77.41	77.99	77.64	-8.19	X
Belgium	91.41	84.47	82.38	82.5	78.83	81.46	81.53	-9.88	
Bulgaria	58.31	63.38	58.52	53.5	56.44	59.48	57.02	-1.29	X
Czechia	70.71	69.67	67.59	65.03	64.09	64.62	65.62	-5.09	X
Denmark	91.15	84.01	77.48	79.92	74.44	70.89	73.91	-17.24	X
Germany	76.52	74.65	75.15	76.56	73.37	73.69	74.05	-2.47	X
Estonia	52.45	52.49	49.85	54.15	52.31	44.74	48.62	-3.83	X
Ireland	112.37	104.65	105.17	105.43	105.3	109.55	113.42	1.05	
Greece	114.56	111.85	108.42	99.42	96.54	93.00	89.69	-24.87	
Spain	125.92	126.15	123.78	114.58	115.58	119.67	116.43	-9.49	
France	95.08	90.29	90.32	90.19	84.8	85.67	85.64	-9.44	
Croatia	87.31	86.2	80.69	76.97	74.3	75.77	76.19	-11.12	X
Italy	98.12	95.79	91.95	86.13	83.11	84.66	83.85	-14.27	
Cyprus	162.37	158.04	149.23	137.16	143.35	143.85	152.92	-9.45	
Latvia	47.77	44.66	44.09	43.8	43.42	43.70	43.77	-4.00	X
Lithuania	42.99	44.22	44.14	41.55	41.52	42.10	42.00	-0.99	X
Luxembourg	101.99	100.51	97.67	93.6	90.82	88.25	87.53	-14.46	
Hungary	70.06	68.42	64.25	61.25	62.01	65.28	65.82	-4.24	X
Malta	142.32	145.85	153.09	139.36	140.96	112.04	99.42	-42.9	
Netherlands	99.02	92.96	90.65	90.72	87.39	91.29	91.63	-7.39	
Austria	109.32	106.35	103.05	103.25	98.56	101.78	103.06	-6.26	
Poland	87.07	86.94	85.41	84.68	81.97	82.72	85.03	-2.04	
Portugal	118.41	116.71	113.71	110.85	111.05	118.33	115.77	-2.64	
Romania	49.56	51.84	50.6	46.76	46.86	47.23	45.82	-3.74	X
Slovenia	105.68	105.71	102.65	98.91	89.63	90.67	95.19	-10.49	
Slovakia	62.65	61.29	58.29	57.73	54.82	55.44	55.63	-7.02	X
Finland	106.74	96.47	88.81	89.91	84.13	79.33	84.03	-22.71	
Sweden	91.32	85.94	81.21	79.16	77.08	76.78	76.1	-15.22	X
United Kingdom	79.26	73.6	75.53	73.76	68.78	66.66	63.64	-15.62	X

↓ - national target below the target for the EU; ↑ - national target above the target for the EU

In the case of thirteen EU Member States the greenhouse gases emissions targets were achieved, while other fifteen EU Member States did not reach the goals in the analysed period of time. Huge differences among the EU Member States in regard to the level of greenhouse gases emissions existing in 2010 should be underlined here; e.g. the level of greenhouse gases emissions in Cyprus exceeded 162% of the 1990 level, in Malta it amounted to over 142% of the 1990 level. On the other hand, the levels of greenhouse gases emissions in Lithuania, Latvia and Romania in 2010 were below 50% of the 1990 levels in those economies. In 2016 the levels of greenhouse gases emissions ranged from 42% of the 1990 level in Lithuania to almost 153% of the 1990 level in Cyprus.

#### **4.5. The reduction of poverty as a challenge**

Global financial crisis 2008+ followed by the period of economic instability and uncertainty resulted in significant increase of poverty and social exclusion in EU Member States. The need for undertaking decisive measures and strong steps aiming at reducing the problem of poverty and social exclusion and promoting social inclusion was stressed and underlined in the Europe 2020 Strategy in its 3<sup>rd</sup> priority. The number of people at risk of poverty or social exclusion in the EU and individual EU Member States was presented (in absolute numbers) in table 7. In 2010 the total number of people at risk of poverty or social exclusion in the EU amounted to 117.9 million and it rose to more than 123.7 million in 2012 (i.e. an increase by almost 5 million was noted).

Fortunately, the years 2013-2017 brought a downward tendency for the EU, as a result of which the total number of people at risk of poverty or social exclusion in the EU in 2017 amounted to 112.9 million. Between 2010 and 2017 a reduction of 4.9 million was noted. The list of the EU Member States with the biggest scale of the reduction of people at risk of poverty or social exclusion included: Poland (reduction from 10.4 million in 2010 to 7.3 million in 2017, i.e. by over 3.1 million), Romania (reduction from 8.4 million in 2010 to 7.0 million in 2017, i.e. by 1.4 million) and Bulgaria (reduction from 3.7 million in 2010 to 2.7 million in 2017, i.e. by around 1.0 million). Unfortunately, in some EU Member States, the situation in 2017 was worse than in 2010. In the case of Italy, the number of people at risk of poverty or social exclusion rose by over 2.5 million (from 14.9 million in 2010 to 17.4 million in 2017). The number of people at risk of poverty or social exclusion in Greece increased by over 670 thousand (from 3 million in 2010 to 3.7 million in 2017). A truly difficult situation was also observed in Spain (12 million people at risk of poverty or social exclusion in 2010, over 13 million in 2014-2015 and over 12.2 million in 2017). In the case of the Netherlands the number of people at risk of poverty or social exclusion increased by over 380 thousand (from 2.48 million in 2010 to 2.86 million in 2017).

*Table 7: People at risk of poverty or social exclusion (thousands) (Eurostat, 2019, own calculations, own elaboration)*

Economy	2010	2011	2012	2013	2014	2015	2016	2017	2010-2017 Change
EU28	117907	120858	123774	122849	122026	119049	118040	112978	-4929
Belgium	2235	2271	2356	2286	2,339	2336	2335	2296	61
Bulgaria	3719	3693	3621	3493	2909	2982	2890	2767	-952
Czechia	1495	1598	1580	1508	1532	1444	1375	1267	-228
Denmark	1007	969	965	1025	1006	999	951	980	-27
Germany	15962	16074	15909	16212	16508	16083	16035	15516	-446
Estonia	289	307	311	313	338	315	318	305	16
Ireland	1220	1319	1392	1377	1279	1207	1135	1088	-132
Greece	3031	3403	3795	3904	3885	3829	3789	3702	671
Spain	12029	12363	12628	12630	13402	13175	12827	12236	207
France	11712	11840	11760	11245	11540	11048	11463	10771	-941
Croatia	1322	1384	1384	1271	1243	1216	1159	1085	-237
Italy	14891	16858	17975	17229	17146	17469	18137	17407	2516
Cyprus	202	207	234	240	234	244	234	215	13
Latvia	798	821	731	702	645	606	554	544	-254
Lithuania	1068	1011	975	917	804	857	871	843	-225
Luxembourg	83	84	95	96	96	95	114	126	43
Hungary	2948	3093	3272	3398	3097	2735	2541	2465	-483
Malta	86	90	94	102	101	99	90	87	1
Netherlands	2483	2598	2492	2648	2751	2744	2797	2864	381
Austria	1566	1593	1542	1572	1609	1551	1542	1563	-3
Poland	10409	10196	10128	9748	9337	8761	8221	7273	-3136
Portugal	2693	2601	2667	2879	2863	2765	2595	2399	-294
Romania	8425	8265	8673	8392	8043	7435	7694	7040	-1385
Slovenia	366	386	392	410	410	385	371	345	-21
Slovakia	1118	1112	1109	1070	960	963	950	856	-262
Finland	890	949	916	854	927	904	896	849	-41
Sweden	1648	1730	1679	1748	1752	1813	1799	1765	117
United Kingdom	14211	14044	15099	15586	15271	14997	14359	14325	114

Having in mind the target adopted in 2010 according to which the total number of people at risk of poverty or social exclusion in EU was to be reduced by 20 million till 2020, the so far realisation of this task is much too low. One should not perceive it as satisfactory. Again, stronger and more decisive actions and measures are required.

## 5. CONCLUSIONS

The situation of the European Union in the second decade of the 21<sup>st</sup> century is truly difficult and complicated. The European Union faces numerous threats and challenges. The Europe 2020 Strategy was introduced in 2010 in order to stimulate and re-direct growth and development of the EU and its Member States. It focused on three inter-related priorities, namely: smart growth,

sustainable growth and inclusive growth. The undertaken research, studies and analysis proved the existence of considerable disparities among the EU Member States in regard to specific targets of the Europe 2020 Strategy. The overall realisation of the Europe 2020 Strategy led to the following generalisations:

- EU28 managed to achieve 2 targets (namely the tertiary education target and the greenhouse gases emissions target);
- Three EU Member States (Czechia, Denmark and Lithuania) achieved 5 targets;
- 4 targets were achieved by three EU Member States (Sweden, Latvia and Croatia);
- Three EU Member States achieved 3 targets (Germany, Italy and Estonia);
- Eleven EU Member States managed to achieve 2 targets only (Austria, Bulgaria, Cyprus, Greece, Hungary, Ireland, Malta, the Netherlands, Romania, Slovenia, Finland);
- Just 1 one target was achieved by six EU Member States (Belgium, France, Luxembourg, Poland, Slovakia and the United Kingdom);
- The worst situation in regard to the level of the implementation of the Europe 2020 targets was characteristic for two EU Member States which did not manage to achieve any of the goals (Portugal and Spain).

The situation in the field of the education targets looked promising (with 14 EM Member States achieving the early school drop-out rate target and 15 EU Member States being capable of achieving the tertiary education target. When it comes to the environmental protection goals, the situation was not bad (the greenhouse gases emissions target was achieved by 13 EU Member States and the renewable energy source target was met by 11 EU Member States). 11 EU Member States were capable of achieving the employment rate target. On the other hand, however, the situation in the area of research and development and innovation activity remained very problematic with the GERD target being successfully achieved by 3 EU Member States only. Having in mind the so far (poor) implementation of the EU 2020 Strategy in many EU member States, it will be extremely difficult for the EU (if not impossible) to meet all the Europe 2020 Strategy targets by 2020. Moreover, one should take into consideration the current global trends, and in particular:

- The human race gets older, middle class grows but at the same time inequalities do widen;
- Sustained development of the world economy becomes more vulnerable to challenges and to weaknesses in the globalisation process, while economic weight and political power shift towards Asia;
- The 4<sup>th</sup> industrial revolution and rapid advancement of technologies and their applications transform societies in almost every aspect; digitisation results in radical, disruptive changes;
- The rise of energy consumption accompanied by the shift of patterns of production – as a result increased challenges relating to managing scarcity of resources are observed;
- Due to the existing interdependence of countries on the one hand, and weak global governance, on the other, the world order becomes more fragile and unpredictable (ESPAS, 2017).

The implications for the European Union are numerous and multi-layered. Therefore, the list of recommendation for the EU is quite long:

- a) The EU economy should be reshaped so as to: create a new platform for sustainable and durable economic growth, mobilise public and private investment, complete the single market (including its digital dimension), enhance the governance of the euro zone create effective Energy Union which should be used in the field of the adoption to climate changes' requirements;



- b) The EU should stronger promote a society of change and innovation through: better use of digital revolution, stronger European research and innovation area, rethinking the education;
- c) The EU should strengthen its efforts aiming at combating the rise in inequality and growing exclusion and in particular: fighting growing inequalities and all sort of negative effects of such a tendency and reshaping the migration debate;
- d) The EU should strengthen democracy and enable individual empowerment;
- e) The international role of the EU should be enhanced, but in order to achieve this goal, the EU itself must be stronger, while its activity must be understood and accepted by the EU societies (ESPAS, 2017).

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## ECONOMIC GROWTH AND NO<sub>x</sub> EMISSIONS IN THE POST-COMMUNIST COUNTRY

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### **ABSTRACT**

*Due to the newly available consistent historical dataset, this paper will contribute to the debate on the link between economic growth and the environmental burden in case of the post-communist country of the Czech Republic. More specifically, the analysis will test environmental Kuznets curve (EKC) for NO<sub>x</sub> emissions between 1980 and 2015. However, modelling on long-term data did only prove decreasing phase of EKC but did not show increasing phase. Therefore, it can be assumed that breaking point occurred earlier than in the monitored period. However, political and economic transformation processes in the 1990s had significant impact on the decreasing burden on the environment in terms of NO<sub>x</sub>.*

**Keywords:** *Economic Development, Environmental Burden, Environmental Kuznets Curve, Decoupling, NO<sub>x</sub> Emissions*

### **1. INTRODUCTION**

Rapid growth of global population and economic growth are phenomena that are closely connected to serious challenges human civilization faces nowadays such as overexploitation, climate change, pollution, or biodiversity loss (UNEP, 2011). Population growth along with the increasing quality of life put pressure on the environment. Especially with increased demands on material, energy sources, but also waste production and greater demand on food production. Economic growth has resulted in significant growth in energy needs (Van Aardenne, Carmichael, Levy, Streets & Hordijk, 1999). According to data of World Bank (2014), electric power consumption (kWh per capita) increased by 160 % between 1971 and 2014. Although the electricity production from renewable sources has been rapidly growing, especially from the turn of the millennium, electricity production from oil, gas and coal sources has grown by more than 6 % in the same time-period. In terms of the Czech Republic, since the establishment of the independent Czech Republic in 1993, electricity consumption (kWh per capita) has increased by almost 25 %. However, fossil fuel energy consumption has been constantly decreasing (World Bank, 2014). Globally, increasing energy demand will result in a large NO<sub>x</sub> emissions increase. Abbreviation NO<sub>x</sub> usually relates to nitrogen monoxide NO and nitrogen dioxide NO<sub>2</sub> and thus will be understood in this work. Man-made NO<sub>x</sub> emissions are produced in processes such in power plants, motor vehicles and industrial and domestic combustion processes (APIS, 2015). NO<sub>x</sub> emissions have many important health but also environmental impacts such as photochemical smog, acid rain, tropospheric ozone, ozone layer depletion and even global warming caused by N<sub>2</sub>O (Carslaw, Beeweers, Tate, Wetmoreland & Williams, 2011; Skalka, Miller, Ledakowicz, 2010). However, NO<sub>x</sub> emissions represent significant (but not the only) indicator of environmental burden of human activities. Interest in the relationship between economic growth and environmental burden has been growing mainly since 1990s. Since that time, this topic became a central subject of many studies. One of the hypothesis claim that in the early stages of economic development, environmental burden is growing faster than revenues, while at a later stage of economic development, environmental burden decreases more slowly than GDP growth (Dinda, 2004; Lešáková, Dobeš, 2018). This hypothesis is called Environmental Kuznets curve (EKC). The aim of this work is to validate EKC for NO<sub>x</sub> as the indicator of environmental burden for the Czech Republic as the post-communist country.

As in many other post-communist countries, authors analysing economic, environmental and social indicators in the Czech Republic struggle with insufficient length of time series of these type of indicators. Moreover, this problem is compounded by the fact that after the fall of the regime in 1989, the Czech and Slovak Federative Republic was split into Czech Republic and Slovakia in 1993. To monitor long-term phenomena before 1989, estimates and modelling are required. Due to newly available historical economic and environmental data for the Czech Republic, this paper offers unique long-term relationship analysis between GDP (economic indicator) and NO<sub>x</sub> emissions (environmental burden indicator). This paper follows previous analysis (Lešáková, Dobeš, 2018) of validity of EKC for CO<sub>2</sub> emissions in the Czech Republic and compares them in Conclusion part of the paper.

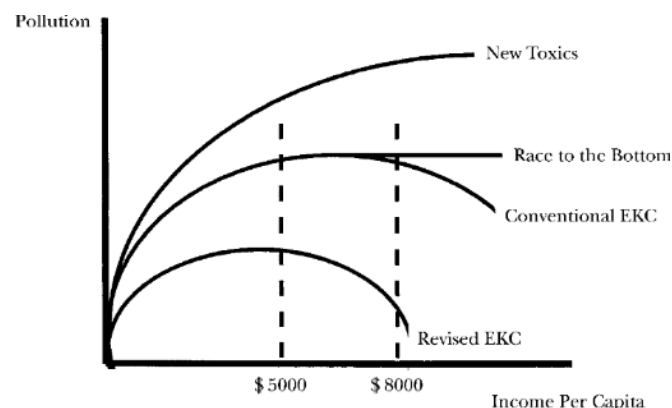
## 2. ENVIRONMENTAL KUZNETS CURVE

The concept of EKC was introduced by authors Grossman and Krueger in early 1990s. In their work (Grossman, Krueger, 1991), these authors described nonlinear inverted u-shaped relationship between income and pollution. According to some authors (Arrow, 1995; Chen, Huang, & Lin, 2019; Dinda, 2004; Dasgupta, 2002) in the first phase of industrialization, along with rising income, there is a sharp increase in environmental pollution. These authors describe in their works following characteristics of the early stage of economic growth:

- Economic development is accelerated by intensification of agriculture and the depletion of natural resources.
- Environmental awareness is low or negligible in an early stage of economic development.
- Environmentally friendly technologies are not available.
- In this phase, people prefer jobs and incomes rather than clean air and water at this time.
- People are basically too poor to pay for improving the environment.
- Environmental regulation is weak at this point.

Environmental burden continues to grow until earnings rise to a certain level (a breakpoint) and second phase occur. As the incomes grows, environmental awareness increases, regulatory instruments become more efficient. Investments into technological development reduces pressure on the environment. People pay more attention to the air and water quality and environment in general.

If we wanted to display the previous description graphically, it could be described as converted u-shape curve as can be seen in the following figure.



*Figure 1: Environmental kuznets curve*

However, EKC hypothesis validity has not been resolved. From the first definition of this hypothesis in 1992, this concept has been extensively studied. EKC was tested for different greenhouse gases responsible for global warming such as CO<sub>2</sub>, SO<sub>x</sub> and NO<sub>x</sub> (Miah, Masum,

Koike, 2010). Many authors have attempted to confirm or refuse the hypothesis by its practical application in various conditions and regions. In study of Sinha, Bhat (2017), n-shaped EKC for NO<sub>x</sub> was observed in India. Same conclusion is provided by study from Italy (Mazzanti, Montini, 2007). On the other hand, in other studies (Caviglia-Harris, Chambers, Kahn, 2009; Busa, 2013) authors doubt that countries can “grow up” from their environmental problems. However, there is persistent uncertainty about EKC validity. As Yang, Zhang, Xue, Ma, Chen & Lu (2018) claim, existence of environmental EKC is not enough to understand how economic growth induced environmental pollution. This paper therefore contribute to this debate on the dependence of GDP and NO<sub>x</sub> emissions.

### 3. RESEARCH METHODOLOGY

#### 3.1. Data Collection

In the Czech Republic, same as in any other post-communist country, qualified users face a problem of insufficient data in long time series. It is problematic to ensure data before 1990. Therefore, they usually rely on estimates in their analysis. In this paper, the source of economic data (GDP) until 1989 comes from the articles (Sixta, Šimková, Vltavská & Zeman, 2016; Vltavská, Sixta & Šimková 2018) and the source of data on GDP since 1990 comes from the Czech Statistical Office (CSO, 2018). This GDP data is methodologically comparable and both respect ESA 2010 standard. Environmental indicator is represented by air quality indicator – nitrogen oxides emissions. NO<sub>x</sub> was chosen as the environmental pollution indicator. The input data table is listed below.

*Table 11: Input Data (Source: own, based on CSO; 2018; EMEP, 2018; Sixta, Šimková, Vltavská, Zeman, 2016; Vltavská, Sixta & Šimková, 2018)*

Year	GDP per capita (CZK, current prices)	GDP per capita (CZK, prices of 2010)	NO <sub>x</sub> per capita (kg)	Year	GDP per capita (CZK, current prices)	GDP per capita (CZK, prices of 2010)	NO <sub>x</sub> per capita (kg)
1980	46,540	229,785	91	1998	208,490	266,341	31
1981	45,354	229,755	79	1999	218,075	270,477	30
1982	47,958	226,538	79	2000	231,627	282,300	28
1983	49,279	229,981	80	2001	251,199	291,884	29
1984	51,403	236,206	82	2002	262,886	297,388	28
1985	52,853	240,323	80	2003	275,483	308,077	28
1986	54,408	246,774	80	2004	300,036	323,026	28
1987	55,536	253,226	79	2005	319,025	343,217	27
1988	56,932	258,564	83	2006	342,156	365,577	26
1989	59,019	261,669	89	2007	372,007	383,963	26
1990	65,065	263,877	52	2008	385,833	390,217	24
1991	84,384	239,585	51	2009	374,628	369,288	22
1992	94,642	233,966	48	2010	376,759	376,759	21
1993	116,265	236,746	44	2011	384,289	384,208	20
1994	132,588	242,142	36	2012	386,317	380,678	18
1995	153,565	257,032	36	2013	389,900	378,785	17
1996	176,275	268,286	35	2014	409,870	388,550	16
1997	190,100	266,994	34	2015	435,911	408,474	16

#### 3.2. Decoupling

As in the previous research (Lešáková, Dobeš, 2018) with validating EKC for CO<sub>2</sub> emissions, this paper is based on the same methodology. A Decoupling Index (DI) is used as a tool to monitor the time changes between environmental pressure and economic growth. This index was presented by OECD (2002) for the first time. Decoupling represents a process of

disconnecting link between economic growth and environmental burden. Decoupling Index is described in the following formula.

$$DI = 1 - \frac{\frac{E_t}{Y_t}}{\frac{E_0}{Y_0}} = 1 - \frac{EP_t}{EP_0} \quad (1)$$

where  $DI$  represents the decoupling index,  $0$  and  $t$  represent the starting and ending year of the reference period,  $E$  is the value of the environmental pressure indicator,  $Y$  is the value of the economic performance indicator.  $EP$  represents  $E$  and  $Y$  ratio,  $EP = E / Y$ , which represents the total environmental pressure. As a result, one of these three situations can occur:

*Table 12: Decoupling results interpretations, source: own, based on Yu et al.(2017), OECD (2002)*

	Decoupling index (DI)	Conditions		Description
Absolute decoupling	$DI = (0;1>$	$Y_t > Y_0$ $E_t \leq E_0$		The economy is growing while environmental pressure does not grow
Relative decoupling	$DI = (0;1>$	$Y_t > Y_0$ $E_t > E_0$	$Y_t/Y_0 > E_t/E_0$	Economics and environmental pressure are on the rise, but the economy has a faster growth rate
Coupling	$DI < 0$	$Y_t > Y_0$ $E_t > E_0$	$Y_t/Y_0 < E_t/E_0$	Economics and environmental pressures are on the rise, but the economy has a slower growth rate

As shown in the table above, the most desirable state is absolute decoupling, when the economy is growing and the pressure on the environment is decreasing. On the other hand, coupling, which represents the opposite and unwanted state, is a situation where the economy and the pressure on the environment are growing, but the burden of the environment is growing faster than the economy. The third possible result is represented by relative decoupling. This occurs when both the economy and the burden on the environment grow. However, the growth rate of the economy is faster in this case than the growth rate of the burden (Lešáková, Dobeš, 2018).

### 3.3. Z-score

For data standardization, standard deviation was applied. Because the variables in different units appear in the empirical part of the research (e.g. GDP/capita is expressed in crowns and  $NO_x$ /capita in kilograms). In order to compare these variables, it is desirable to convert them to the same scale by standardization. In this paper, standard deviation method was applied. The simplified formula can be expressed as:

$$z = \frac{x - \mu}{\sigma} \quad (2)$$

where  $x$  represents the value of the monitored indicator,  $\mu$  represents the mean of the values,  $\sigma$  represents the standard deviation.



## 4. RESULTS

### 4.1. Testing EKC for NO<sub>x</sub>

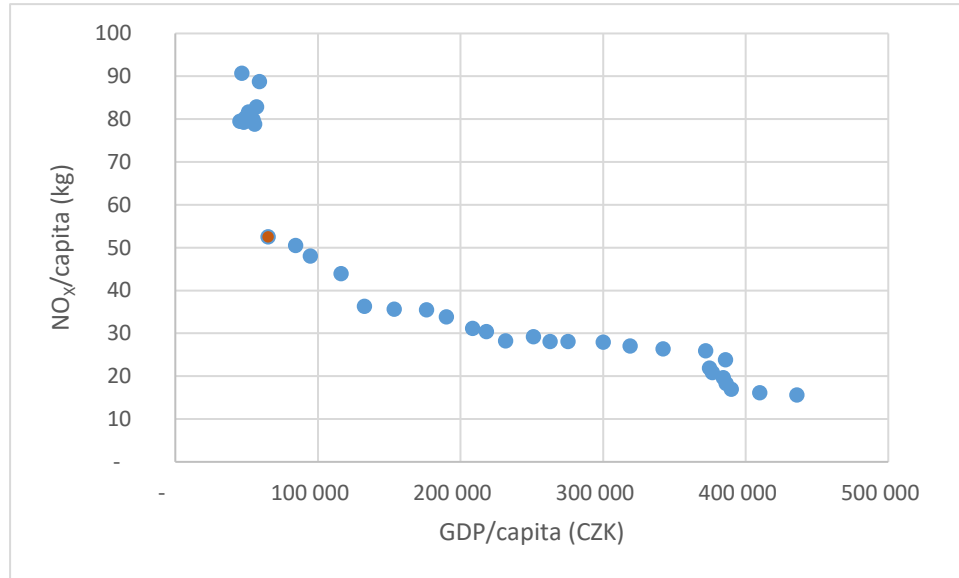


Figure 2: Testing EKC for NO<sub>x</sub>

Same as in the previous research for CO<sub>2</sub> (Lešáková, Dobeš, 2018), it is not clear from the graph whether the EKC model for NO<sub>x</sub> is valid in the Czech Republic. Mainly because the growing phase of this curve is not clear. However, it is evident that there was a break in the late 1980s and that the curve continues to decline (year 1990 is shown in red colour). The transformation processes in economy after 1989 accelerated the decline of NO<sub>x</sub> emissions. To provide deeper analysis, decoupling analysis between 1980 and 2015 will be investigated by using input data. By assigning input data to the decoupling formula we obtain the following equations:

$$DI = 1 - \frac{\frac{16_{2015}}{435,911_{2015}}}{\frac{91_{1980}}{46,54_{1980}}} = 1 - \frac{0,037_{2015}}{1,9_{1980}} \quad (2)$$

$$DI = 0,98 \quad (3)$$

This result, when  $DI > 0$ , tells us that in the observed period, when the starting period is 1980 and the final period is 2015, absolute decoupling actually occurs. Following graph represents decoupling graph where normalized data is used. This graph shows clear trends. NO<sub>x</sub> emission per capita has decreasing trend and GDP per capita has increasing trend. From a certain point in time, the economy produces increasing value with less environmental burden. It is evident that this break point happened in 1997. However, significant NO<sub>x</sub> decrease has been ongoing since the late 80's. It is due to combination of the change in vehicle sheet, as well as a decrease in energy emission and industrial sources. Therefore, we can assume that political and economic transformation processes in the 1990s had significant impact on the decreasing burden on the environment in terms of NO<sub>x</sub>. However, intersection of economic performance curve and environmental burden curve occur eight years after the political transformation. In comparison with previous research for CO<sub>2</sub>, this intersection for NO<sub>x</sub> appears ten years after the CO<sub>2</sub> intersection.

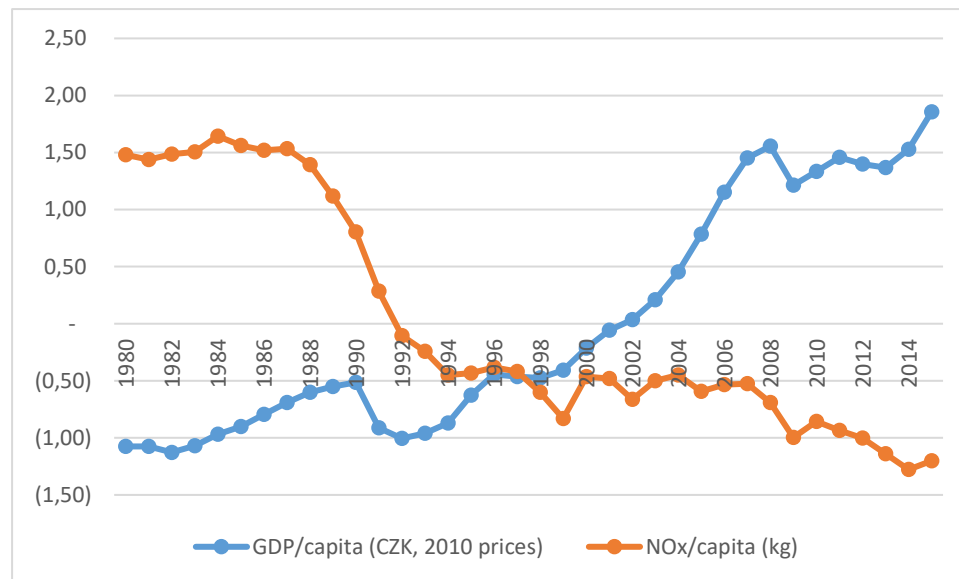


Figure 3: Decoupling of z-score values (Source: based on own calculations)

## 5. CONCLUSION

Population growth along with the increasing quality of life put pressure on the environment. Especially with increased demands on material, energy sources, but also waste production and greater demand on food production. Due to newly available historical economic and environmental data for the Czech Republic, this paper offers unique long-term relationship analysis between GDP (economic indicator) and NO<sub>x</sub> emissions (environmental burden indicator). However, it is not clear from the graph whether the EKC model for NO<sub>x</sub> is valid in the Czech Republic. Mainly because the growing phase of this curve is not clear. The decoupling method was also used to fulfil the objective of the paper. The analysis shows that the economy produces increasing value with less environmental burden effect over the reporting period. In comparison with previous research for CO<sub>2</sub>, this intersection of NO<sub>x</sub> curve and GDP curve appears ten years after the CO<sub>2</sub> curve intersection with GDP curve. For further research, it would be interesting to determine the main drivers to predict curves intersection in developing countries that deal with severe environmental burden.

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## **(PLANNED) PUBLIC PRIVATE PARTNERSHIP PROJECTS FOR THE DEVELOPMENT OF POLISH INLAND WATERWAYS**

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### **ABSTRACT**

*Inland waterway transport constitutes an important part of the transport system in many countries as well as grounds for transport services rendered pursuant to the requirements of sustainable development. In Poland, there are about 3650 km of navigable inland waterways. The problem is that only 6 % of them includes waterways which satisfy the requirements (class) of international waterways, and many inland ports fail to meet up-to-date standards. Such situation results from many years of negligence and lack of necessary infrastructural investments. The ratification of AGN convention by Poland, in 2017, is an important moment for implementing changes as well as various infrastructural projects with different sources of funding. Some of them are planned as Public Private Partnership. So far, this solution has not been applied in Poland within this mode of transport. The aim of this article is twofold: 1) to present the current state of inland waterways infrastructure in Poland as well as the scheduled infrastructural investments, 2) to analyse the specificity of scheduled PPP initiatives in the Polish Inland Waterways. In order to fulfil the main objective of this article, the author analysed the reference literature, legal acts and recently published investment plans regarding the development of inland waterways in Poland as well as the Database of PPP investment plans in Poland, managed by the Ministry of Investment and Economic Development, and Shortened investment project descriptions. The article provides the current condition of inland waterways in Poland, the inland waterway development plans in Poland and the support programmes, as well as formal and legal grounds of the analysed issues. Special attention was paid to projects planned in the form of PPP.*

**Keywords:** *Inland Waterways, Public Private Partnership; Sustainable Transport Development*

### **1. INTRODUCTION**

The transport system is one of the pillars of a country's socio-economic development. Given the increasing transport intensity of modern economies and simultaneous awareness of the damaging impact of transport on the natural environment, it is particularly important to shape the transport system so as to minimize this impact as much as possible. This has been addressed in different EU documents over the years, among them the 2011 White Paper with its list of goals towards a competitive and resource-efficient European transport system (European Commission, 2011, p. 1-30). One of the objectives there assumes that 30% of road freight (per over 300 km) should move to rail and water by 2030, and 50% - by 2050. To achieve this, appropriate infrastructure will need to be developed, including a fully functional TEN-T core network, relevant information services, and land-and-water transport management systems such as the ERTMS (European Rail Traffic Management System) or RIS (River Information Services) (European Commission, 2011, p. 10). Given these challenges, the Polish transport system has undergone substantial changes: expansion of motorways and expressways is underway, railways are being modernized, while air and sea ports along with intermodal terminals are being both modernized and expanded. Several investments have already been made for the two core corridors of the TEN-T network running through Poland: the Baltic-Adriatic Sea and the North Sea-Baltic Sea. Of all these, the mode of transport that calls for special consideration due to long-term negligence is inland waterway transport. Just recently, a number of planning initiatives were undertaken which will hopefully improve the poor

condition of waterways in Poland, encouraged further by the ratification in 2017 of the AGN Convention (European Agreement on Main Inland Waterways of International Importance). In connection with the planned investments, potential sources of their financing are also discussed, among other, as a part of public-private partnership (PPP) projects. This solution was also covered in the White Paper, namely attention was drawn to the need of using diversified sources of financing - both public and private (European Commission, 2011, p. 14). This paper is the product of the authoress' long-term investigation of different aspects of the development of transport and logistics infrastructure (Miklińska, 2016, 2017), and it builds on these previous studies. In her research, the authoress has also explored PPP, e.g. in relation to launching logistics centres and improving the competitiveness of enterprises (Miklińska 2011), or to Poland's PPP market in the area of transport infrastructure and transport services (Miklińska, 2018). Previous analyses prompted the observation that the emergence of several initiatives for inland waterways (as projects of high value) is a particular novelty among the planned projects. This led the authoress to address this problem in depth. Hence, the aim of this paper is twofold: 1) to present the current state of inland waterways infrastructure in Poland as well as the scheduled infrastructural investments, 2) to analyse the specificity of scheduled PPP initiatives in the Polish Inland Waterways.

## **2. PUBLIC PRIVATE PARTNERSHIP IN INLAND WATERWAYS - LITERATURE REVIEW**

The problem of financing transport infrastructure as part of PPP initiatives has been investigated by various authors in the literature (Nidziy, 2017; Zhang, Chen, 2013, Miklińska, 2018). A broad review of articles in this field was made by (Hodge, Greve, 2018). Research shedding light on the global and European PPP market data indicates a predominance of the transport sector among the implemented projects. According to the European Investment Bank Report (2019), the transport sector (and numerous infrastructural projects implemented as part of it) remains the dominant industry in terms of the value of PPP projects in the European market. This trend was maintained in 2018 (worth of transactions over EUR 7 billion) (European Investment Bank, EPEC, 2019, p. 3). Among the largest transactions (with financial close) in 2018, there was also a project concerning inland waterways – the Blankenburg tunnel (EUR 1 billion) in the Netherlands (European Investment Bank, EPEC, 2019, p. 1). Analyses of issues related to PPP projects for inland water transport and inland waterways are also aplenty in the literature. Cases studies of different countries can become a valuable benchmark for such projects. A review of such experiences was made by Miloslavskaya and Plotnikova (2018), a paper in which they discuss the issues related to the system of water transport infrastructure for Germany, the United States and the Russian Federation. They note in there a common trend of increasing the number of PPP projects for inland water transport. They also pinpoint common problems, such as the lack of financing and difficulties in the development of inland water transport using only public sources of financing. In addition, they identify the trend of attracting funds from the private sector, including in the form of PPP, as beneficial for both parties (Miloslavskaya and Plotnikova, 2018, pp. 51-63). Voskresenskaya, Vorona-Slivinskaya and Ponomarewa (2018) argue that the current global trend is engagement in the development of inland waterway transport industry not only from owners, but also infrastructure users, which helps attract additional sources of investments and speed up modernization works. In some countries such as Russia, problems are encountered with generating interest among private investors (Voskresenskaya, Vorona-Slivinskaya, Ponomarewa, 2018, p. 1, 5). The U.S. PPP market was researched in a study by the Horinko Group (2013), whose authors, for proposed PPPs for the U.S. inland water infrastructure, reviewed and characterized types of PPP (for locks and dams), to then indicate their advantages and disadvantages (The Horinko Group, 2013, pp. 1-119).

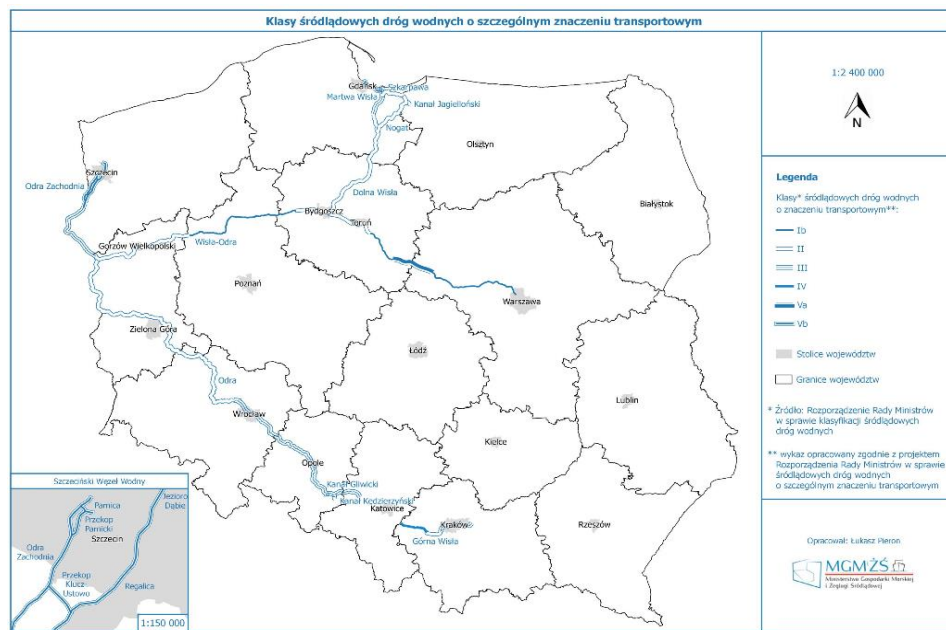
In summary, an important feature of PPP is that it is a solution combining public and private goals, and which therefore responds to the challenges of sustainable development. No wonder then it is cited repeatedly in the White Paper (2011), where the need to improve the regulatory framework for PPP and the search for innovative financial instruments is highlighted. The document also contains a number of more detailed recommendations in the context of the use of this instrument for financing projects under the TEN-T framework (European Commission, 2011, p. 14,28,29).

### **3. STATUS QUO OF INLAND WATERWAYS IN POLAND**

Poland, due to its geographical location, topographical relief and length of existing waterways, has potentially favourable conditions for the development of inland waterway transport. In 2017, the total length of navigable waterways in Poland was 3 654 km, including 2 417 km of regulated navigable rivers, 644 km of canalised river sections, 335 km of canals, and 259 km of navigable lakes. Navigation currently takes place in Poland on approx. 3 363 km (92.1%) of navigable waterways (CSO, 2018a, p.1). Looking back, it should be noted that the length of waterways classified as navigable has long been showing a downward trend in Poland - in 2000, it was 3 813 km (CSO, 2008, p. 358). In Europe, countries with the longest waterway network are: Finland (8 136 km), Germany (7 675 km), the Netherlands (6 257 km), and France (4 733 km) (European Commission, 2018). In most of them, waterways are used intensively to transport goods, whose total volume was: 222 731 thou. tonnes for Germany in 2017, 365 510 thou. tonnes for the Netherlands in 2016, 63 247 thou. tonnes for France in 2017 (CSO, 2018b, p. 84). It should be noted that Poland ranks relatively high in Europe in terms of length of waterways. However, much fewer cargo is transported by Polish navigable waters - only 3 604 thou. tonnes in 2017. For comparison: the length of waterways in Germany is only 2.1 times that of Poland, but 61.8 times more goods are carried through (in terms of weight); in the Netherlands, with the waterways length 1.7 times that of Poland, 101.4 times more goods are transported; in France, with the length 1.3 times that of Poland, 17.5 times more cargo is moved. Not only that, the highest share of this transport in Poland pertains to domestic transport (2 536 thou. tonnes) and much less to international transport (1 064 thou. tonnes). In 2017, only 4 thou tonnes of cargo was carried in transit through Polish waterways (CSO, 2018b, pp. 86-87). Worse still, this rate has not changed much in recent years. Western European countries use inland waterways much more often to handle international transport. In Germany, for example, international transport is about three times larger than domestic, and it is almost twice as large in the Netherlands (CSO, 2018b, pp. 86-87). Transport of cargo by waterways in Poland differs significantly from trends observed in Western Europe. Clearly, a number of factors are at play here, especially the class of waterways existing in Poland. International routes (Class IV and higher) make up only about 6% of all waterways in Poland, with the majority rated as Class I, Class II and Class III, with an overall share of 94.1% in the total length of waterways in Poland (CSO, 2018a, p. 1).

*Figure following on the next page*

Figure 1: Classes of waterways of special transport importance (MGMiŻŚ, 2017, p.60)



Two principal waterways in Poland are the Oder River Waterway and the Vistula River Waterway. Looking at the map, these waterways have sections of different classes, and both require significant infrastructure outlays. Currently, the Oder River Waterway is the more important transport route of the two (see Fig. 1), although even here, full sewerage by barrages is required in certain sections (the free-flowing Oder), while others demand either new or updated hydrotechnical substructure (the canalised Upper Oder or partial sewerage of water rivers by barrages in the Border Oder) (MGMiŻŚ, 2016b). Investment plans for Polish waterways are discussed in Section 4 below. Importantly, transport management system (Marek, 2017) is a complementary component of modern infrastructure. For inland navigation, this is achieved through RIS, whose mandatory implementation includes international waterways and the ports located along these routes. So far, RIS have been introduced in Poland in selected sections of the Oder River Waterway (with a total length of 97.3 km), with another 30 km planned (CSO, 2018b, pp. 15-16).

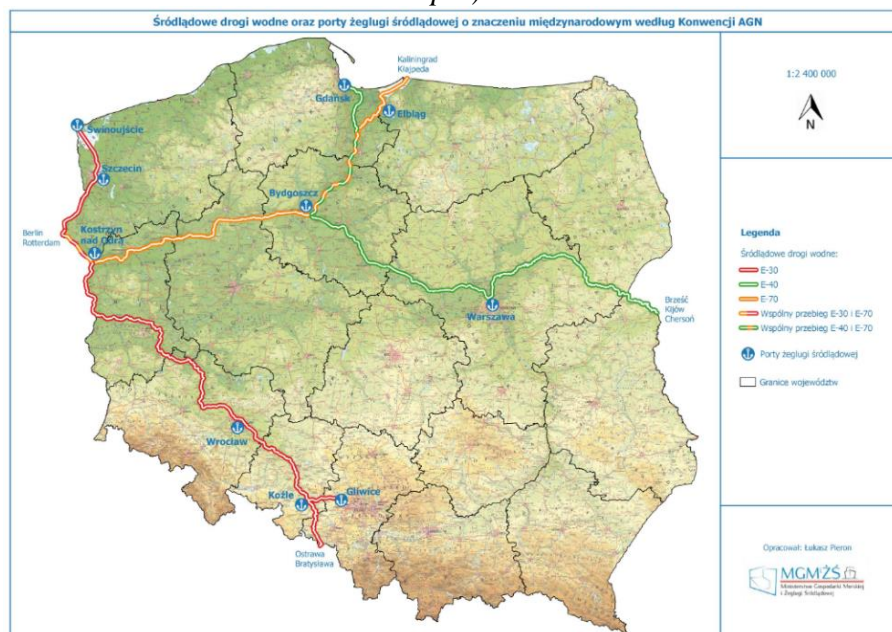
#### 4. FORMAL AND LEGAL ISSUES OF DEVELOPMENT OF INLAND WATERWAYS IN POLAND

The problem of waterway development in Poland has been addressed in a number of strategic documents over the years. One of the most general of these (concerning all modes of transport) is the 2013 Transport Development Strategy until 2020 (with 2030 perspective), a document which emphasizes the necessity to restore operating parameters for inland waterways performing transport functions (especially within the Oder River Waterway) and aligning them with European requirements (MTBiGM, 2013, p. 56, 73). Joining the efforts to improve inland navigation, the Polish Ministry of Maritime Economy and Inland Navigation issued an expert evaluation for the development of waterways in the years 2016-2020, with a view until 2030. This document provides an overview of the current state of Polish inland waterway transport divided into waterways: E-30, E-40, E-70 (their numbering corresponding to that used in the AGN convention, which Poland was planning to ratify at that time), and pinpoints the missing shipping links (e.g. the Oder-Danube and the Silesian Canal). Ultimately, the proposals outlined the scope of investment tasks for Polish waterways, sources of financing as well as economic and non-economic effects of modernization of waterways (MGMiŻŚ, 2016b, p. 1-76). The evaluation provided the basis for Assumptions for the development plans of inland waterways



in Poland for 2016-2020 with 2030 perspective, adopted by the Resolution of the Council of Ministers in June 2016. The document indicates the scope of investment tasks to be implemented in the short and long term (MGMiŻŚ, 2016a, p. 1-14). In the short term, the scope of tasks includes, among others: the updating of strategic national documents, preparation of documentation for planned investments in the long run, the updating of Water Management Plans, search for additional sources of financing, e.g. from the Connecting Europe Facility or as part of PPP (especially for co-financing dams, where hydroelectric power plants will be installed), upgrade of hydraulic engineering facilities (especially on a free flowing section of the Oder) and the construction of dams in Lubiąż (the Oder) and Ścinawa (the Vistula). Among the long-term tasks, the following should be mentioned: adaptation (to the parameters of Class Va) of the Oder River Waterway (construction of the Polish section of the Danube-Oder Canal and the Silesian Canal), a cascade of the Vistula river (of the central and lower section), upgrade of the remaining sections of the routes E-40 and E-70 and of the upper canalised section of the Vistula river (to parameters of Class Va), the construction of dams in Niepołomice and Podwale (the Vistula), and the implementation of RIS (on internationally important waterways) (MGMiŻŚ, 2016a, p.7). An important event from the point of view of adapting Polish waterways to European standards was the ratification of the aforementioned AGN Convention in March 2017, whose main goal is to build or modernize inland waterways in order to adapt them to the parameters of at least Class IV and so that they meet the requirements of inland waterways for the TEN-T network (CSO, 2018b, p. 13). There are three shipping routes running across Poland, which are the already mentioned waterways (Fig. 2): E30; E40, and E70 (CSO, 2018b, p. 13).

*Figure 2. Inland waterways and inland ports subject to the AGN Convention (MGMiŻŚ, 2017, p.6)*



Currently, as part of comprehensive planning works leading to the modernization of Polish waterways, two important programs are being developed: the Oder River Waterway Development Program (in cooperation with the Ports of Szczecin and Świnoujście Authority) and the Vistula River Waterway Modernization Program (in cooperation with the Port of Gdańsk Authority) (MGMiŻŚ, 2019). The role of seaports in the development of these programs is considerable. For ports, this is an opportunity to carry out hinterland transport (Rolbiecki, 2018) in line with the concept of sustainable development.



As potential sources of financing for planned investment projects, the Ministry indicates: the Cohesion Fund, the European Regional Development Fund, the Fund Connecting Europe Facility, the European Fund for Strategic Investment, as well funds from the National Fund for Environmental Protection and Water Management, the Inland Navigation Fund, state budget, local governments' budget, and funds from investors from different (interested) sectors (MGMiŻŚ, 2016a, p. 11).

## **5. PPP FOR INLAND WATERWAYS – PLANS IN POLAND**

The use of PPP for the development of transport infrastructure is mentioned in a number of Polish strategic documents, among others, in the aforementioned Transport Development Strategy (MTBiGM, 2013, p. 90). In Poland, hands-on experience has already been gathered regarding the implementation of PPP projects in this area. An increase in their number was reported after 2008, when the second (better suited to Poland's needs) PPP Act entered into force. In 2017, the Polish Government also published The Government Policy for the Development of PPPs, discussed by the authoress in her article from 2018 (Miklińska, 2018). An important initiative for the Polish PPP market has been the launching and periodic updating of the PPP project database in Poland (with concluded contracts and planned initiatives). The analysis of this database involving concluded contracts found that, between 2009 and 28 February 2019, 20 such projects were started in the field of transport infrastructure in Poland, with zero projects for the infrastructure of inland water transport (Ministry of Investment and Economic Development, 2019). A novelty in the Polish PPP market is that such projects can be found among planned initiatives. Currently (as at 31.12.2018), the database lists 26 PPP projects planned for transport infrastructure in Poland, of which four concern inland waterways: one for building the important waterway canal, the Silesian Canal; another for constructing barrages and a cascade in the waterway (Table 1) (Ministry of Investment and Economic Development, 2018a). These projects are, of course, included in the previously discussed Assumptions for the Development Plans of Inland Waterways in Poland for 2016-2010, and their implementation may contribute to the development of waterways in Poland by initiating a new important connection such as the Silesian Canal and improving infrastructure in the existing waterways. The importance of these projects is discussed in Table 1.

*Table following on the next page*

*Table 1: Planned PPP projects for inland waterway infrastructure (based on Ministry of Investment and Economic Development data, 2018a; Szymański, Korbus, 2018 p. 125, 126)*

Project*	Scope and the importance of the project	Project value
Constructing the Silesian Canal	<ul style="list-style-type: none"> <li>- design, financing and construction of an internationally important inland waterway;</li> <li>- the channel will connect the Upper Vistula with the Oder River Waterway (and will thus be integrated into the TEN-T network);</li> <li>- the waterway will relieve the road and railway links between Wrocław and Krakow, and will activate the region in general.</li> </ul>	PLN 11000000000, or approx. EUR 2558000000
Constructing a cascade for the free-flowing section of the Oder River (from Brzeg Dolny to the estuary of Nysa Łużycka)	<ul style="list-style-type: none"> <li>- modernization and extension of the Oder River Waterway (from Malczyce to the estuary of the Nysa Łużycka);</li> <li>- construction of a cascade in this section of the Oder River will give rise to an internationally important waterway and will be a major step towards integrating this connection into the TEN-T network;</li> <li>- the project will enable transportation of cargo from Silesia to seaports in Świnoujście and Szczecin and to Western Europe.</li> </ul>	PLN 6600000000, or approx. EUR 1535000000
Constructing a dam on the Vistula River (below Włocławek)	<ul style="list-style-type: none"> <li>- the dam will reduce the risk of flooding by minimizing the risk of ice jams; in addition, it will help to counteract drought;</li> <li>- ensuring the safety of the water level in Włocławek;</li> <li>- creating conditions for the creation of a Class IV waterway;</li> <li>- providing electricity.</li> </ul>	PLN 3300000000, or approx. EUR 767000000
Constructing a dam in Lubiąż (on the Oder River)	<ul style="list-style-type: none"> <li>- the dam will help minimize the risk of flooding and will enable the production of electricity;</li> <li>- the investment will contribute to the extension of the waterway with international parameters and will be an important step towards the integration of the Oder River Waterway into the TEN-T network;</li> <li>- the investment will enable navigation from Silesia to seaports in Szczecin, Świnoujście and to Western Europe.</li> </ul>	PLN 400000000, or approx. EUR 93000000

*\*project names have been shortened for greater clarity*

A common feature of all planned projects for inland waterway transport is their high value. According to the classification adopted for the Polish PPP market, three are the largest projects (over PLN 500 million), and one is very large (PLN 250-500 million). As mentioned, transport infrastructure projects of such a high value were not included in the database of projects with concluded contracts. Moreover, the state administration has so far (since 2009 in the aforementioned database) not acted as a public partner in the projects concerning transport infrastructure (Ministry of Investment and Economic Development, 2019). Recently, the central administration has been the initiator of several significant planned infrastructure projects, and more specifically the Ministry of Maritime Economy and Inland Navigation for inland waterways initiatives (Ministry of Investment and Economic Development, 2018b, pp. 43-52). Private entities who may potentially be interested in such partnerships tend to be divided into two groups. The first group includes those entities which plan to use waterways to provide services such as transport of persons, cargo or production of electricity (e.g. energy companies, entities managing inland or sea ports), while the second group includes potential partners who consider projects related to inland transport as a capital investment (e.g. investment and pension funds, or other financial market institutions) (MGMiŻŚ, 2016b, p. 58). The legal basis cited (in three cases) for choosing a private partner for waterway investments is Poland's Public Procurement Law (and not the law referring to the mode of future concession). Such a solution imposes under the Polish legislation future »availability payments« for private partners. Many believe that investment-planning under this model testifies to the growing maturity of Poland's PPP market, bringing it closer to other foreign markets where more such solutions are in place, protecting the private partner against demand risk (Szymański, Korbus, 2018, p. 72, 82). Aside from funds from private partners, the following are indicated as potential sources of financing

for the discussed projects: state budget, the Development Fund for waterways of special transport importance, or funds from international financial institutions (World Bank, EIB, EBRD). In addition, in the case of three projects, EU co-financing is already being planned (Ministry of Investment and Economic Development, 2018b, p. 43, 44, 46, 52). Overall, three stages - or phases - of planning PPP initiatives can be distinguished for the Polish PPP market: (1) idea, (2) search and selection of external consultants, and (3) pre-implementation analysis (Szymański, Korbus, 2018, pp. 63-64). For all PPP projects listed in Table 1, their current status in the database is marked as "pre-implementation analysis" (Ministry of Investment and Economic Development, 2018a), meaning they are at a quite advanced stage of planning (they have reached the last planning stage), thereby making their actual implementation all the more hopeful.

## 6. CONSLUSION

Public-private partnership is a way to carry through investments in the area of water and inland transport infrastructure, as mentioned in a number of strategic European and Poland's domestic documents. The legitimacy of PPP is also indicated by different cases studies from Europe and around the world, discussed in the literature. A number of PPP projects for transport infrastructure have already been implemented in Poland. Currently, with inland waterway investments being planned under this model, they have revealed a certain pattern. An initiator and public partner of the planned projects, of high value at that, is the central administration in Poland. The legal formula adopted for the selection of private partners, as well as the related implementation and future »availability payments« to protect the private partner against demand risk (Szymański, Korbus, 2018, p. 72, 82), may attract private entities to these partnerships. The planned investments for the development of inland waterways in Poland show a specific receptivity to PPP-based solutions, and at the same time, fit into the concept of sustainable development - hydroelectric power plants can be built on the barrages. This is beneficial from the perspective of acquiring energy from renewable sources and can be a magnet for private partners (e.g. energy companies) potentially interested in such ventures. This, in turn, will make implementation of these PPP projects markedly more likely, a clear advantage against the backdrop of foreign experiences where acquiring private partners proved problematic.

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## **BRAND VALUE SOURCES: CASE STUDY OF BANK BRANDS IN SLOVAK REPUBLIC**

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### **ABSTRACT**

*Nowadays traditional marketing theory has changed and there is a need to revise it according to new theorems. The emphasis is given not only on general marketing tools, but also on behavioural aspects of economics. The look on brand value sources was limited to general financial aspects and data of companies while the detection of specific brand value sources in specific conditions of different environment wasn't take into consideration. Based on the mentioned the main goal of the study is to identify relevant brand value sources in specific conditions of Slovak republic and to design an effective innovative model of brand value building and management. The data used in the study were obtained by primary survey carried out on the sample of 2000 respondents (citizens of the Slovak Republic older than 15 years) in 2018. Based on the statistic evaluation of the given data by the so-called factor analysis, whose results were supported by implementation of KMO Test, Barlett's test of sphericity and calculation of Cronbach's Alpha for individual brand value sources and their components on the example of bank brands. We have found out significant specificities of the national brand value sources. Therefore, we state that the specifics of the national socio-cultural profile have a significant affect on the perceived brand value sources across markets and product categories.*

**Keywords:** *Behavioural approach, Brand, Branding, Brand value, Socio-cultural national profile*

### **1. INTRODUCTION**

The existence of a fundamental schism of the principal construct of the brand across markets in their regional perception has already been found in the scientific literature. (Nadanyiova, 2017; Heinberg et al., 2018) The basis of this theory was to demonstrate the dual perception of the brand - primarily in its status level (brand management in the traditional market economies), respectively, primarily in the context of its qualitative parameters (brand management in former transit economies or emerging markets). (Lizbetinova & Weberova, 2016). The identification of this phenomenon has prompted the need to revise existing models of the brand building and management, especially with the emphasis on the need to review the position of communication and product policy in the marketing mix. Contemporary market reality indicates that traditional economic theories are failing and there is a need to reassess them by a behavioural approach that includes both, sociological and psychological aspects of the examined economic

phenomena. While for some areas of economic theory and practice is such an approach innovative, in other areas it is experiencing its renaissance. Such a renaissance also takes place within the brand management that stresses the behavioural approach across all its theoretical concepts. However, these concepts record the occurrence of an increasing number of exceptions from their historically proclaimed universal validity in the confrontation with the present economic process, which creates the need for their revision. Brochado and Oliveira (2018) examined the specifics of the brand management in the case of Portuguese wines. Their paper aimed to examine the main determinants of the brand equity in the context of brands defined by their region of origin, as in the case of Portuguese green wine. The study's results reveal that the brand loyalty is the most influential dimension of the brand equity for Portuguese green wine and that the links are significant between the brand equity and brand association and perceived quality. These findings prioritise (and facilitate to allocate) resources across – brand equity dimensions. However, their findings are never confronted with generally perceived sources of the brand value in the context of the socio-cultural profile of consumers. The explanatory power of their findings is at the same time distorted by the choice of the products themselves. Lazaroiu and Rommer (2017) state that the brand value sources vary primarily with regard to the consumer behaviour mechanism that is typical for the reviewed branded product and which at the same time converges the most with the identified national socio-cultural profile. According to Voyer et al. (2017) until now there is no explanation of the individual socio-cultural characteristics of consumers in the context of the sources of their perceived brand value in the literature. Parameters that are relevant in the context of exploring the sources of the subjectively perceived brand value are identified differently in the literature. Baalbaki and Guzman (2016) state the need to re-evaluate the traditional brand equity model. According to them the literature lacks an empirically based consumer-perceived brand equity scale despite the importance of the concept and the need for brand equity measures. Their article develops a brand equity conceptualization and a scale determined by dimensions that consumers perceive. This consumer-perceived and consumer-based brand equity scale is made up of four dimensions: quality, preference, social influence and sustainability. However, the applicability of this modified model is after some time disputed by Stocchi and Fuller (2017). Huang et al. (2016) accentuate the so-called brand relationship quality (BRQ) and the customer relationship quality (CRQ). They state on the example of retail services that it is more important to depart from this approach and demonstrate the mediating roles of brand relationship quality (BRQ) and customer relationship quality (CRQ) in the relationship between brand benefits and brand loyalty in retail service contexts, while the literature often pays particular attention to how brand benefits develop relationship quality, such as trust and satisfaction,. Dwivedi et al. (2016) emphasize the so-called brand recognition as the underlying parameter of the subjectively perceived value. They conceptualise the theoretical framework of the brand management through demonstrating the importance of the consumer brand knowledge, the category involvement and the corporate-level associations in driving engagement behaviours, thereby accommodating the role of brand-level, category-level and corporate-level factors. Czubala (2016) states that the brand awareness is an essential part of the brand attitudes. Saenger et al. (2017) accentuate in the context of exploring the brand value the element attributes. They provide case study and state that broadening the brand positioning is challenging because the strong brand images are resistant to change. This is the reason why consumers are likely to reject attempts to associate new discrepant attributes due to the incongruence with the brand's existing image. Yu et al. (2017) state that consumers tend to imagine product features, functions, or usage that they have learned from previous exposure to and experiences with brands, especially when they engage in online apparel shopping. Prior brand-related factors, such as brand familiarity and brand loyalty, may influence imagery elaboration – the activation of stored information in the production of mental images beyond that provided by the stimulus.

Porto (2018) also uses summarized identified elements of brand value (imageries, attitudes, attributes and benefits), who uses them to modify Aaker's traditional CBBE brand value model. Their comparison within the selected national socio-cultural profile across product categories in specific literature is still absent. It is not possible to take a clear view of the need to take account of behavioural specificities of brand management not only across markets but also across products. The identified shortcoming is removed by the study presented by us in the present paper.

## 2. DATA AND METHODOLOGY

Data used in the presented study were both primary and secondary. The primary data were conducted using the method CAWI (Computer Assisted Web Interviewing) by an external agency in 2018 on a sample of 2000 respondents from the Slovak Republic aged over 15 years (acquiring legal personality according to valid Slovak legislation). The reason for such a limitation was the requirement to ensure the autonomy of purchasing decisions and the real mirroring of the value of the brand in the economic behaviour of the Slovak population. The structure of the surveyed sample was socio-demographically representative. Referring to the quadratic typology of purchasing behaviour, depending on the degree of engagement and differentiation (Bracinikova & Matusinska, 2017; Peters, 2017) and the national socio-cultural profile of the Slovak Republic, it is possible to identify as a relevant type of buying behaviour the so-called dissonance-reducing buying behaviour characterized by a high engagement in obtaining additional information about products and a low differences between brands. A suitable product for examining the internal variability of subjectively perceived sources of the brand value in the conditions of the specific market of the Slovak Republic are bank brands in the context of above mentioned. On the other side secondary data were obtained from the socio-cultural profiles of the countries according to Geert Hofstede (available 5/12/2018 on <https://geert-hofstede.com/>). From the viewpoint of usability in economic sciences, Hsu et al. (2013) indicate precisely the sociological model of cultural specifics, so-called Hofstede model of socio-cultural dimensions, as the most appropriate. This model was created in the 80s of the 20th century. The reliability and validity of this model were verified in the context of current global change by Basnakova et al. (2016). This model defines the socio-cultural profiles of the countries using six basic attributes, namely: 1) power distance; 2) individualism; 3) masculinity; 4) uncertainty avoidance; 5) long term orientation and 6) indulgence. Mazanec et al. (2015) using this model generally state the impact of the socio-cultural profile of consumers on their purchasing behaviour. The impact of national specifics on perceived brand value is stated using this model by Hur et al. (2015). However, their findings are only of a general nature, and the issue of detecting the impact of individual socio-cultural profile attributes on the value of the brand is not specified in their research. The Slovak Republic acquires values outside the range values of the scale 0-100 (which are an indicator of the ambiguity of characteristics of dimensions of socio-cultural profiles and, therefore, their usability in the context of marketing practice is low) in dimensions "power distance" (100), "masculinity" (100) a "long term orientation" (77) - above average values and in dimension "indulgence" (28) below average values (available 5/12/2018 on <https://geert-hofstede.com/>). In the context of these findings, in the light of the marketing implications of the questionnaire survey (Sobocinska, 2017), we have compiled a questionnaire and filled the brand value sources (imageries, attitudes, attributes and benefits) with each relevant component. These are summarized in Tab. 1.

*Table following on the next page*



*Table 1: Brand value sources and components (self processed)*

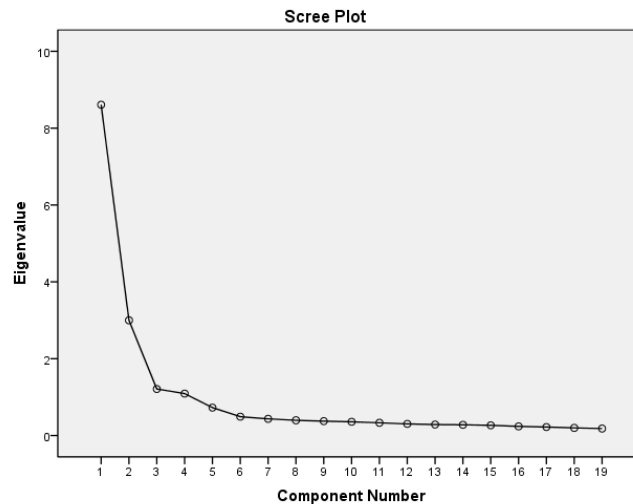
Brand value sources	Components of brand value sources / Code
<b>imageries</b>	prestige / 1
	pleasure / 2
	expectation / 3
	certainty / 4
	modernity / 5
<b>attitudes</b>	I aim to buy branded products / 6
	I am interested in branded products on a regular basis / 7
	branded products attract my attention because I consider them better / 8
	branded products attract my attention because I consider them more prestigious / 9
<b>attributes</b>	modernity / 10
	quality / 11
	creativity of ad / 12
	popularity / 13
	ability to attract attention / 14
<b>benefits</b>	it makes me happier / 15
	it increases my social status / 16
	it makes it easier for me to get friends / 17
	it attracts the attention of others / 18
	it belongs to my lifestyle / 19

Customer comparison of subjectively perceived brand value sources in the category of bank brands (based on the so-called Likert's scale) was statistically evaluated using factor analysis. Factor analysis is a multidimensional statistical method aimed at creating new unobservable variables, the so-called factors, which reduce and simplify the original number of data while retaining a substantial portion of the information. The linear combination of factors approximates the original observation, capturing the hidden relationships between the original variables. (Vochozka, 2010) In the last decades, the use of this method has grown in the sphere of social sciences, mainly through the development of information technology and the reduction of subjective interventions. (Lipovetsky, 2017) The starting point for this analysis is the definition of the statistical model and the determination of rational assumptions. To determine the factors, it is necessary first to examine the dependencies between the original variables using the covariance or correlation matrix. The condition for performing the data reduction is the correlation of the original variables resulting from the matrix and the assumption that found correlation arises due to the existence of a smaller number of undetected hidden variables, the so-called factors. Consequently, it is possible on the basis of mutual relationships to diversify the original variables into subgroups where variables within one group correlate more than with the variables of the other groups (Jinho & Havin, 2017). To determine the adequacy of the statistical sample, we use the KMO (Kaiser - Meyer - Olkin) Test. The adequacy of a statistical sample can be determined when the resulting test value is greater than 0.6. Barlett's test of sphericity is used to determine the degree of dependence between variables. Its resulting value should be less than 0.05. The intrinsic consistency of the factors is verified by the so-called Crombach's Alpha (condition is considered met if the resulting value is greater than 0.8). Based on the results of factor analysis, we are able to determine the order between the individual brand value sources in the category of bank brands. We compare the observed ranking and formulate the conclusions that can be used in the practice of building and managing brand value across products and markets.

### 3. RESULTS AND DISCUSSION

Based on the provided literature review and mentioned methodology we can summarize the main results of provided research. Firstly, we applied KMO (Kaiser – Meyer – Olkin) Test, which indicates the sampling adequacy ( $> 0.6$ ). It has reached a value of 0.936 in the case of bank brands. Similarly, Barlett's test of sphericity also identified dependence between variables ( $< 0.05$ ) by acquiring the resulting value at 0.00. Therefore, we can assume the relevance of four relevant factors. (see Fig. 1)

Figure 1: Scree plot of bank brands value sources – Factor analysis



The testimonial value of factor analysis in the case of the brand value sources of bank brands has reached a value of 73,222%. (See Tab. 2)

Table 2: Total variance explained – bank brands value sources (self processed)

Code	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.609	45.311	45.311	8.609	45.311	45.311	4.858	25.566	25.566
2	2.999	15.784	61.095	2.999	15.784	61.095	3.483	18.331	43.897
3	1.212	6.380	67.475	1.212	6.380	67.475	2.941	15.481	59.378
4	1.092	5.747	73.222	1.092	5.747	73.222	2.630	13.844	73.222
5	.727	3.825	77.046						
6	.491	2.583	79.630						
7	.435	2.289	81.918						
8	.397	2.087	84.006						
9	.374	1.968	85.974						
10	.357	1.878	87.851						
11	.332	1.749	89.600						
12	.302	1.590	91.190						
13	.286	1.507	92.698						
14	.280	1.475	94.173						
15	.266	1.402	95.575						
16	.237	1.249	96.824						
17	.222	1.167	97.991						
18	.200	1.050	99.041						
19	.182	.959	100.000						

For individual components of brand value sources of bank brands has been verified their grouping within individual brand value sources based on factor analysis - i. e. benefits with Cronbach's Alpha value 0.887 (45.311% of variance), imageries with Cronbach's Alpha value 0.887 (15.784% of variance), attitudes with Cronbach's Alpha value 0.810 (6.380% of variance) and attributes with Cronbach's Alpha value 0.911 (5.747% of variance). This explains the exceptions to the applicability of the theory of the need to take into account the specificities of the national socio-cultural profiles that arise in practice. We have found that 1) the specificities of the national socio-cultural profiles are relevant in scope of the brand value management, but 2) the order of importance of brand sources through various brand categories is different and reflects the specificity of the branded product category. On the example of bank brands, it is possible to illustrate the possible reason for failing brand management. Therefore, if the brand management applied the basic theoretical model of building and managing its value without taking into account the specificities of the Slovak national socio-cultural profile, it would have high negative influence on the perceived brand value. So, in the case of bank brands it is necessary to build the brand value mainly on the factor benefits and imageries. This applies not only to the selected product category but also to the brand of other products that, from the point of view of the purchasing behaviour mechanism, belong to a shopping behaviour based on the so-called dissonance-reducing buying behaviour (i.e., which is characterized by a high engagement in obtaining additional product information and a low differences between brands). Since this mechanism has been identified as the most representative of the Slovak socio-cultural profile, it can be stated that there is a need to supplement the current state of knowledge of brand management with the specifics of perceived importance of brand value sources in other product categories, which is based on the proved diversity in the order of the brand value sources between the selected product characterized by such a mechanism. Such knowledge will contribute to modifying the current concept of irrationality in consumer behaviour with impacts on the brand management theory and practice in such a way that on the platform, the specificity of national socio-cultural profiles will create a construct of priority for individual brand value sources (assuming that the priority of components within them will be unchanged as this reflects national socio-cultural specificities in full).

#### 4. CONSLUSION

The presented study deals with the identification of the relevant brand value sources which are significant for Slovak socio-cultural profile based on which can be proposed an effective innovative model of brand value building and management. We assumed that the resources of the subjectively perceived brand value sources vary within the specificities of national socio-cultural profiles across product categories. The data used for the fulfilment of the given goal were obtained by primary survey carried out on the sample of 2000 respondents (citizens of the Slovak Republic older than 15 years) in 2018. The survey was carried out by the CAWI method. Based on the statistic evaluation of the given data by the so-called factor analysis, whose results were supported by implementation of KMO Test, Barlett's test of sphericity and calculation of Cronbach's Alpha for individual brand value sources and their components on the example of bank brands. We have found that 1) the specificities of the national socio-cultural profiles are relevant in scope of the brand value management, but 2) the order of importance of brand sources through various brand categories is different and reflects the specificity of the branded product category.

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## **AVOCADO (PERSEA AMERICANA MILL) INDUSTRIALIZATION AS A REGIONAL SUSTAINABILITY DEVELOPMENT STRATEGY**

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### **ABSTRACT**

*Avocado production is a profitability and competitiveness business, is a job generator and is a healthy food. Food habits and tendency consumption is looking for nutraceutical and healthy products. There is an interest to get avocado oil for human consumption because its highly non-saturated fatty acids and the benefits in human health. The objective of this study was to evaluate the technical, financial and economic viability of an oil avocado plant. Information was obtained from 82 avocado producers belonging to three avocado local Associations. The study was carried on between 2015 and 2016. Productive and post-harvest productive chains methodology was used as a diagnosis tool and for the construction of SWOT matrix. Financial evaluation was determined with a five-year horizon. The commercial strategy, technical and financial design was integrated considering contributions from the partners, subsidies and financing. Finally, a risk analysis was carried out based on Net Present Value (NPV), Internal Return Rate (IRR), Cost-Benefit Ratio (CB/R) and Period recovery (PR) indicators, based on product sales prices. This analysis reported low uncertainty in contrast to the Minimum Return Rate of 13%, being the financial indicators: NPV of \$ 217,448 USD; IRR of 25.4% and CB/R 2.26, PR of 3.0 years. The sensitivity analysis showed that the project can support a reduction in the sale price of up to 0.55 USD.*

**Keywords:** *Avocado oil, Financial profitability, Local development, Sustainability*

## 1. INTRODUCTION

Mexico is the world's leader in avocado production (FAO-FAOSTAT, 2018). In 2016 the total volume of production was 1,889 thousand tonnes, in a total planted area of 205,250 hectares (507,183 acres) distributed in 28 States; Michoacan concentrates 72.32% of the planted area, followed by Jalisco with 9.51% and the State of Mexico 4.32%. The remaining 13.85% is distributed in the rest of the producing states (SIAP, 2017). During this period the total production value was 30,265 thousand Mexican pesos. (Cruz et al., 2013) mentions that crops such as avocado have a high added value, given they produce a great amount of job positions and generate profits. Of the national production, 69% is consumed fresh, 12% is exported and 19% is industrially used (Peña et al., 2015). The Mexican per capita consumption, in 2017, was 7.0 kg (15.4 lbs) of fresh avocado (SIAP, 2017), although it is also consumed in several other presentations; salsa, guacamole and oil. Avocado is a greatly rich food, it contains a high proportion of monounsaturated fatty acids (MFA), a lower amount of saturated fatty acids (SFA) and no cholesterol. Approximately 60% of the fatty acids are monounsaturated, 20% are polyunsaturated and the rest are saturated (Pérez et al., 2005). This fruit is considered as a functional food and has been recognized as a source of energy, low in calories and sodium, with a high content of MFA, vitamin E, ascorbic acid, vitamin B6,  $\beta$ -carotene, potassium and more than 20 other essential nutrients (Restrepo et al., 2011). The commercial opening, the entering in different commercial trades and recently the bilateral trade with the United States, as well as the increasing demand for fruits and vegetables, the consumer trends and the promotion of sectoral, state and federal policies, that drive a productive reconversion towards fruits and vegetables, export crops by excellence, have boosted the avocado's expansion in Mexico. In this sense, the average annual growth rate (AAGR) with respect of the national surface, for the period 1980-2017 was 3.4% (SIAP, 2017). Nevertheless, simultaneous to the production volume increase, the pests and diseases also increased (Sangerman et al., 2014), as well as the loss associated with several factors such as: shrinkage due to maturation, damage caused by hits, fungus and bacteria, uneven maturation, fibrous pulp, product rapine and quarantine pests (NOM-FITO-066-2002), these factors demerit the price and limit the distribution in local markets, therefore alternatives for industrialization are required (Restrepo et al., 2012). In Mexico, an increased interest in the food industry has been shown in recent years, for the transformation of avocado in avocado oil, some of the properties of this raw product is their high smoke point, this high content of unsaturated fatty acids that lower the blood cholesterol (Pérez, et al., 2005), this and some other characteristics such as the percentage of proteins, carbohydrates, vitamins and minerals, grants its great nutritional value (Forero, et al., 2007). Avocado oil presents similar characteristics as olive oil (CODEX-STAN-033-1981; NMX-F-052-SCFI-2008) in addition to the content of unsaturated fatty acids  $\omega$ 3,  $\omega$ 6 of 759,292 mg/100 g, 12862,302 mg/100 g respectively and Vitamin E of 10,11 mg/100 g, which makes avocado oil a functional and highly nutritive feed (Yepes et al., 2016). The aim of this study was to evaluate the technical-economical viability of the investment project of extraction of avocado oil; in three municipalities in the State of Mexico, in the search for strategies that minimize the adverse effects of the increase in the production volume and that create a favorable development environment for the territorial scale, through industrialization processes with high value, and the technology transference to the avocado producers.

## 2. METHODOLOGY

This present study was conducted in the central region Mexico in the municipalities of: Malinalco, Ocuilan, and Tenancingo, located in the southeast of the State of Mexico, coordinates: 18°46'00" and 19°06'00" north latitude; 99°25'00" and 99°39'00" west longitude. The study area is located in the tropical deciduous forest, with the presence of different types of reliefs, soils, watersheds, arid and semiarid climates that promote biological diversity as well

as the agroecological and cultural diversities (INEGIa, 2009; INEGIb, 2009; INEGIc, 2009). The diagnostic was collected from the census of 82 producers of three avocado local associations in the three municipalities mentioned earlier, during 2014-2016. A questionnaire was used as a tool for collecting data, structured in two sections a) production; and b) postharvest. The evaluation was qualitative; during this process two workshops were imparted; the first one to the key producers of the participant municipalities and the second one to the technical assistance service providers and to the rural extension program evaluators. The information analysis used a logical process, building a SWOT matrix (strengths, weaknesses, opportunities and threats) of the links of the production line and postharvest, that defined action strategies oriented to use the strengths of the line, to take advantage of the existing opportunities at the surroundings and to mend the weakness that might be critical while facing the existing threads (Ponce, 2007), this derived in the seek for an added value with the project: Extra virgin avocado oil extraction. The investment project was structured according to the evaluation and project formulation methodology by (Baca, 2013). The analysis was determined in a five years horizon. The commercial strategy, technical and financial design was integrated considering contributions from the partners, subsidy and financing. The commercial strategy consisted in the analysis of four parameters: product, price, place and promotion, this methodology focuses its efforts in sales in order to insert itself to the market (INCA RURAL, 2003). For the product the following sections are considered: season when it is available, intrinsic quality, presentation, degree and type of transformation, market segment and available technology. In the case of the price, consisted in considering the market prices of the existing products in contrast with production costs. The place and promotion describe the marketing channel, it was considered wholesale channels the marketing channel and the type of product promotion for its insertion in the market (INCA RURAL, 2003, Baca, 2013). The project's technical viability was determined based on factors such as: land location, services and communication channel, product availability, urban centers of consumption. The land was located in the municipality of Ocuilan. It counts with services: water, electricity and phone line, the location is strategic with the places of production and with primary communication routes close to three urban centers of commercialization and consumption: México city, Toluca and Cuernavaca. The project's size was defined according to the availability of the raw materials and partner's resources, the production plant will start operations at 75% of its installed capacity, with 60 Tones of fresh product monthly, the extraction will be carried out by centrifugation in three ways. The proposed legal framework that protects the company is a SPR of RL (Rural Production Society of Limited Responsibility, acronym in Spanish) partially exempt of tax on rental income. The project consists of the establishment of infrastructure, machinery and equipment for the operation of a processing plant-extractor of virgin avocado oil for consumption (NMX-F-052-SCFI, 2008). The economical and financial profitability parameters were evaluated with a mixture of resources, 25% contribution of the partners, 25% small producers finance by FND, (2017), subsidy 50% Agrocluster component (DOF, 2016). The indicators used were those that consider money and time, such as: NPV (Net Present Value), IRR (Internal Rate of Return) C/B (Cost-Benefit ratio) MARR (Minimum Accepted Rate of Return) RP (Recovery Period). The economic and financial evaluation are valued concepts that express a company investment profitability and based on the results the implementation of a project can be accepted or rejected it also allows to select and evaluate different investment alternatives (Franco, et al., 2014). The NPV is a value updated by the discount rate or the prefixed update of the net price flow (Total costs - Total benefits) generated for an investment project. The Net Present Value is calculated according to the following formula, in discrete time and as long as the interest rate stays constant (Azqueta, 2007, Baca 2013).



$$NPV = \sum_{t=0}^T \frac{B_t - C_t}{(1+r)^t}$$

Where:  $B_t$  are the benefits of the year  $t$ ,  $C_t$  the costs of that same year  $t$ ,  $r$  the interest rate or the discount rate and  $T$  the contemplated project life. The decision rule in the economic evaluation of investment projects should be NPV equal or greater than zero i.e. the sum of the net present flows minus the investment costs in terms of their equivalent value at this time or zero time, must be equal to or greater than zero (Baca, 2013).

The Internal Rate of Return (IRR): Was evaluated based on a single rate return per period, with which the total of updated benefits is exactly the same than the disbursements expressed in current currency (Franco, et al., 2014). It is called Internal Rate of Return because allegedly the money earned year by year is totally reinvested. Meaning that, it is the rate of return generated entirely within the company through reinvestment. It is a calculated that makes the NPV equal to zero (Azqueta, 2007, Baca 2013).

$$NPV = \sum_{t=0}^T \frac{B_t - C_t}{(1+IRR)^t} = 0$$

If the IRR of an investment are above the interest rate that reflects the profitability of different alternatives (opportunity cost) the investment must be executed. The MARR (Minimum Accepted Rate of Return), was estimated based on the period inflation (BANXICO, 2017), more than 9 percentage points taxed to small producers FND, (2017), under the researcher's criteria under a constant production (Baca, 2013). The MARR calculated on this project was 13%. The Cost-Benefit ratio consists in the sum of the updated benefits divided by the sum of the updated costs, the calculus according to Franco et al., (2014) is done:

$$\frac{RB}{C} = \frac{\sum_{i=1}^n \frac{B_t}{(1+r)^t}}{\sum_{i=1}^n \frac{C_t}{(1+r)^t}}$$

$B_t$  equals the benefit in each period of the project,  $C_t$  cost in each period of the project,  $r$  equals the update rate or discount rate,  $t$  equals periods in years. If the C/B ratio is above 1 it is acceptable (Baca, 2013; Franco et al., 2014). The Recovery Period (RP) the expected net flows of the updated project were used according to the expression used by Peña et al., (2015).

$$RP = \text{Year prior total recovery} + \frac{\text{Cost not recocered at the begginig of the year}}{NPV \text{ during the year}}.$$

The sensitivity analysis was made on Excel 2008 spreadsheet like an hypothesis analysis considering the NPV. The indicators were evaluated based on the sales price of the final product.

### 3. RESULTS AND DISCUSSION

The SWOT matrix summarizes the main aspects that characterize the productive line of avocado and propose strategies on the short, medium and long term to add value to it, for its characteristics the avocado industrialization for oil production proved viable (Table 1).

Table 1: SWOT matrix (the authors)

<p><i>Strengths (S)</i> Favorable agro-climatic conditions for the avocado production. Cluster of supplies, machinery and equipment. Formally constituted, literate producers, average age 49 years.</p> <p><i>Opportunities (O)</i> Capacity of adoption of technological improvements and innovation: cultivation phenology and nutrition, promotion of certification processes and application to GFP (Good Farming Practices), implementation of food safety programs. Selection, packaging and handling post-harvest. Processing and industrialization of the product and insertion to new marketing channels. Increasing national and international demand of functional products. Access to governmental subsidy and sources of credit and finance.</p> <p><i>Weaknesses (W)</i> Small producers 1.0-5.0. "Ejidal and communal" regime. Temporal production system. Minimal degree of mechanization. Different production, density and age systems. Presence of pests and diseases. Ignorance of the phenology of the crop. Low added value due to the lack of infrastructure for: selection, packaging, postharvest treatment and avocado Deficient marketing channels, local markets, lack of certification and low quality of the fruits. Non specialized technical assistance. Difficulty accessing to credits and no risk prevention. Disarticulated productive chain.</p> <p><i>Threatens (T)</i> Quarantine pest. Theft of the avocado fruit without physiological maturity. Opening of markets. Crop expansion and low quality of the product.</p>	<p><i>Short term.</i> Training, integration and strategic planning of the associations in the areas of administration and production. Product industrialization and insertion to new marketing channels. Legal formalization of the partners on an association specialized on marketing and industrialization.</p> <p><i>Medium term.</i> Elaboration of strategic marketing plans, for the access to subsidy and governmental credits. Product industrialization and insertion to new market channels.</p> <p><i>Long term.</i> Selection and packaging (NMX-FF-016-2002). Start and implement certification process for GFP (NOM-EM-034-FITO-2000) and quarantine pest control (NOM.066-FITO-2002).</p>
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### 3.1. Commercial Strategy

#### 3.1.1. Product

Raw avocado oil: fatty fluid, color slightly amber, extracted by mechanic means or physical means from the pulp and seed of the avocado tree fruit (*Persea americana*). Sensory characteristics: Characteristic product smell, slightly nutty, exempt of strange smells or stale, transparent fluid free of strange bodies at (293°K) 20°C (NMX-F-052-SCFI, 2008). This product is marketed on an amber bottle on a 1.0 liter presentation. The chemical composition is presented in Table 2.

Table 2: Chemical composition of avocado oil (NMX-F-052-SCFI, 2008)

Fatty acids	Maximum	Minimum
Oleic acid C18:1 56 74	56	74
Linoleic acid C18:2 10 17	10	17
Linoleic acid C18:3 0 2	0	2
β-Sitosterol mg/kg	89	92
α-Tocopherol mg/kg	64	100

Avocado oil is offered to high to medium socioeconomic level consumers (Mora, 2016), age range between 35-55 years old (Solís, 2012; UAZ, 2015), who look for products that in addition to feeding them, contribute with intrinsic properties, without considering the price.

#### 3.1.2. Price

This was fixed on \$130.00 Mexican pesos according to the production costs and was compared with the average market price of existing products in supermarkets and online stores. On the other hand, the average price of the by product was fixed on \$13.00 Mexican pesos, it was estimated based on the production costs.

According with the typology of the avocado consumer Solís (2012), consumers are more concern for their health than the product price point which ensures market acceptance.

### 3.1.3. Place and promotion

Starting with national sales. For the promotion the use of social media such as Facebook and a website are proposed, those tools represent an auspicious medium for the product's promotion. The product's name is Avocado oil *Ocuilli*.

### 3.2. Technical study

The production plant is located on the municipality of Ocuilan de Arteaga, the total surface is 10,000 m<sup>2</sup>, the value of the property was estimated on \$500 thousand mexican pesos. The location is strategic considering it is close to communication routes with Mexico City, Toluca and Cuernavaca and also with the producing municipalities; Malinalco, Ocuilan and Tenancingo. Its monthly productive capacity is 60 Tons of fresh fruit and the volume of production is 8,364 liters of oil, in a single turn, working only at 75% of installed capacity. This was determined by the producing volume of the partners and their contribution. The extraction of avocado oil was evaluated by a centrifugation process, utilizing the principle of differentiation between water and oil densities, this process is made on temperatures below 45°C, (113°F) to preserve the nutritional properties of avocado, the expected performance is 60% of oil, this process is carried out according to the established on the (NMX-F-052-SCFI, 2008). For the operation of the project 3 administrative and 7 operative employees are required. The investment project includes the civil project, machinery and equipment. The legal framework of the organization is a SPR of RL (Rural Production Society of Limited Responsibility, acronym in Spanish) this type of societies are partially exempt of tax on rental income (SHCP, 2016).

### 3.3. Economic and financial evaluation

The investment project was a value of \$ 3,715,8 thousands of Mexican pesos, the financial sources are SAGARPA with 50% of the total project through the subsidy Agrocluster, the 25% will be financed by Financiera Nacional de Desarrollo (FND, National Financial Development) with two types of credit; refractory \$500 thousand pesos, and labour capital \$1,205.7 thousand pesos, both fixed to an annual rate of 9%, this corresponds to the small producers program (Chard 2).

*Table 3: Investment budget and financial sources (Thousands of Mexican Pesos) (the authors)*

Concept	Amount	SAGARPA (50%)	Partner's contribution (25%)	FND (25%)
Fixed investment	2.500.1	1.000	1.000	500
Land	500	0	500	
Civil project	405	202.4	101.2	101.2
Machinery and equipment	1.595.2	798	399	399
Trade mark	50	25	25	
Deferred investment	10		10	
Organization expenses	10			
Labour capital*	1.205.7			1.205.7
Total	3.715.8	1.025	1.010	1.705.7

The marketing plan is linear from the first year of operations with \$13.047 thousands of pesos for the concept of oil and \$4.414 thousands of pesos for the sale of avocado paste as product

and by product respectively. This was obtained multiplying the liter price point (\$130 pesos) by the average estimated production volume (100.4 m<sup>3</sup>), with an annual total of \$17.462 thousands of pesos. The operation costs are in straight line during the whole horizon of the project. The costs plan (Chard 3) summarizes, only the variable and fixed costs. In the conditions stated, the projected fixed costs were less than the variables, given the cost of the workforce. Thus, the annual costs (Table 4) for the first year are: total annual fixed costs \$210 thousands pesos and total annual variable costs \$14.258.5 thousands of pesos.

*Table 4: Annual operation costs (Thousands of Mexican Pesos) (the authors)*

Concept	Year 1	Concept	Year 1
Fixed costs	<b>210</b>	<b>Variable costs</b>	<b>14.258</b>
Salary	194	Supervisor	145.8
Energy	3.6	Asistent	61.5
Paper	6.0	Operator	1.782
Water	6.0	Raw material	10.080
Transportation	6.0	Packaging	1.806
		Box	144
		Water	225

The projection of investment (Table 5), depreciations and residual value (Chard 4), was made through the straight-line method, the only approved in Mexico for fiscal purpose (Baca, 2013, Peña et al., 2015). The applied labour capital is used at the beginning of the operations and it is amortized at the end of the first period.

*Table 5: Investment, depreciations and residual value (Thousands of Mexican Pesos) (the authors)*

Concept	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Fixed investments						
Civil project	404.9	20.2	20.2	20.2	20.2	20.2
Machinery and equipment	1.595		319	319	319	319
Labour capital	1.205					
Subtotal	3.205					
Accumulated depreciation		20.2	20.2	20.2	20.2	20.2
		319	319	319	319	319
Annual depreciation		20.2	40.4	60.7	80.9	101.2
		319	638	957	1.276	1.595
Total residue value						1.696

The information to determine the value of the profitability indicators are presented on Table 6 and, corresponds to the net flow of the project (NFP). Expenses estimates (costs and expenses) was expressed in this format and corresponds to cash flow (Baca, 2013). The calculation of the net flow of the project is; sales income minus total costs. The total costs are integrated by; fixed costs, variable costs, depreciations and interest rate on the credits. The profits before taxes or gross profits equals to the difference between total income and total costs. The project flow incorporates the tax discount plus profit distribution, depreciation, amortization of the credits, increase of fixed assets and labour capital, and investments, resulting in the net flow of the company (NFC).

*Table 6: Net flow of the project (Thousands of Mexican Pesos) (the authors)*

Concept	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Sales income		17.462	17.462	17.462	17.462	17.462
Total costs		14.962	14.841	14.834	14.826	14.817
Fixed costs		210.0	210.0	210.0	210.0	210.0
Variable costs		14.258.5	14.246.5	14.246.5	14.246.5	14.246.5
Depreciations		340.2	340.2	340.2	340.2	340.2
Interests		153.5	45.0	37.4	29.2	20.3
Gross Profit		2.499.6	2.620.1	2.627.6	2.635.8	2.644.8
Taxes		993.9	1.036.1	1.038.7	1.041.6	1.044.7
Distribution of profits to workers		283.9	296.0	296.7	297.6	298.5
Dep.+amor.+int.		493.8	385.2	377.7	369.5	360.6
Increase to labour capital		0	12.0	0	0	0
Investments	(3.715.8)					
NFP	(3.715.8)	1.715.4	1.685.2	1.669.8	1.666.1	1.662.1
Financial flow	(3.715.8)	1.442.7	128.5	128.5	128.5	128.5
Capital		1.289.2	83.5	91.0	99.2	108.2
Interests		153.5	45.0	37.4	29.2	20.3
NFC	(3.715.8)	3.158.2	1.813.8	1.798.4	1.794.7	1.790.7

To calculate the updated flow, the bank interest rate 9% minus the inflation of the period 5.28% was used. From the resulting difference the second discount rate, plus 1 equivalent to the update factor (UF) was obtained. This updated discount rate 13.01% was applied in the last column of the Table. This project maintains its economic life due to the expected positives cash flow (Peña et al., 2015). Summarizing, the IRR 25.4% (Table 7) was superior to the MARR, so, based on this indicator this project should be accepted. By definition the IRR is the updated rate that makes NPV to equal zero, and this method means that the partners have the opportunity to reinvest their cash flow in their own internal rate of return to generate the monetary profitability through the NPV (Peña et al., 2015). The real profitability (Baca, 2013) of the project is obtained by subtracting the MARR minus IRR, so 25.4 % - 13 % = 12.4 %.

*Table 7: Profitability indicators (the authors)*

Indicator	Value	Definition and rule of decision	Rule of decision
NPV	3,979,3	VAN > 0 Represents the utilities of the investors	Most be accept
IRR	25.4	TIR > than TREMA	Most be accept
C/B ratio	2.26	B/C > 0	Most be accept
RP	3.0	3 < 5	Most be accept

Meanwhile, the C/B ratio obtained was greater than the 1. Under these criteria the project is accepted for being greater than one. Meaning that during the economic life of this project for every peso invested in the project, the company will receive 2.26 pesos of total benefits. Based on the RP, the number of years required to recover the original investment, the project must be accepted, therefore under the conditions stated above, the avocado oil project will be paid in less than three years (Table 7). The sensibility analysis of the project showed a price reduction in the main product of \$ 10.0 Mexican pesos and a byproduct of \$9.0 Mexican pesos.

#### 4. CONCLUSIONS

According to the profitability indicators: NPV of \$ 217,448 USD; IRR of 25.4%; CB/R 2.26, PR of 3.0 years, the project is viable. The project is sensitive to variations in price, sales, volume and other independent variables, but does not affect, in a risky manner, the profitability indicators. It supports a reduction in the sale price of up to 0.55 USD. The implementation of the project can promote territorial Sustainability development in the production system and in the political, infrastructure and agroecological area.

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# NFV AND NETWORK SECURITY WITH ANSIBLE

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## **ABSTRACT**

*Increase demand for cloud computing technologies led to the new era of Information Technologies (IT). Consequently, Network functions virtualization (NFV) because traditional networks didn't have a capability to satisfy new demands. Networks are faced with large demand for bandwidth, agility, flexibility and scalability. Beside all that requirements, our environment need to be secure. Security in cloud computing has task to secure data between multiple system, hypervisors, virtual machines (VMs) and external/internal networks. Simple and efficient tool like Ansible satisfies all needs and is used for configuration, orchestration and deployment.*

**Keywords:** NFV, Network security, security, cloud computing, SSH, Ansible

## **1. INTRODUCTION**

Network Function Virtualization (NFV) was created by service providers who published the White Paper in 2012, describing the reasons for NFV. The reason for introducing new services such as NFV, was to respond to the rapid development of the network services, because hardware-oriented networks are limited. With NFV we get cost reduction and accelerated network development that is now scalable, rapid and agile. NFV is a subset of Software Defined Network (SDN) and separates the network functions such as encryption, firewalls or Network Address Translation (NAT), from dedicated hardware and moving them on virtual servers. The main purpose of NFV is reducing the cost of dedicated hardware in the network, by replacing the hereditary hardware functions with software functions that operate on the generic x86 server. It enables fast and cost-efficient deployment of network functions for better service agility and supporting the agile and flexible deployment of network functions along with their lifecycle management [1]. With the network that can adjust to new challenges rapidly, security should be in first place. Each component has some level of vulnerability, and it is necessary to have it in mind while planning and have a good set of protection. Small failures can mean significant losses. It is essential to treat virtual networks the same as physical ones, because they are equally vulnerable.

## **2. NETWORK FUNCTION VIRTUALIZATION - NFV**

The NFV architecture consists of four main components: NFV Infrastructure, VNF, Management and Network Orchestration (MANO) and OSS / BSS Layer.

### **2.1. NFVI**

NFVI is a set of hardware and software resources that provide the infrastructure that Virtual Network Functions (VNFs) perform, including servers, switches, virtual switches and virtual machines. NFVI is divided into three parts: hardware, virtualization layer and virtualized resources. Hardware resources within NFVI are computer hardware (servers, hard disk, RAM, etc.), storage resources and network hardware (routers, switches, firewalls, etc.). The second part of NFVI is a virtualization layer that stands just above the hardware. It isolates the hardware

part of the software and allows the software part to use virtual infrastructure irrespective of hardware. This allows the primary layer of hardware to handle one or more virtual machines (VMs), and they share the resources of that physical layer. An example of NFVI is a hypervisor that provides many benefits, such as the ability to spin multiple VM instances on physical hardware with its operating system and applications, thus fully exploiting the capabilities of a physical server, while traditional physical hardware can spin only one instance. VM's are mobile, meaning they can move from one server to another without having to reinstall the various components because they are independent of the hardware. There are two types of hypervisors. The first one is a bare-metal hypervisor and he is installed directly on physical hardware. Examples are VMware ESX/ESXi, Hyper-V and Oracle VM. Another type of hypervisor is the one that spins on the operating system and provides virtualization services such as memory management. Some examples of another type of hypervisor are VMware Fusion, Oracle VM VirtualBox and KVM.

## **2.2. Virtual Network Function (VNF)**

The Virtual Network Function (VNF) layer consists of VNFs. The first generation of NFW system implementations transferred existing monolithic applications to large virtual machine appliances, each representing a single Virtual Network Function (VNF). Multiple VNFs are then chained together using a Service Function Chain, which determines how packets are forwarded from one VNF to another, to constitute a Network Service [2]. VNFs are software packages that can implement network functions that are operated by dedicated hardware. This leads to reduced network costs, flexibility and better network management. Also, it can help with scalability and network agility. Examples of VNF are virtual firewalls (vFirewall) and virtual routers (vRouter).

## **2.3. Management and Network Orchestration (MANO)**

MANO includes the management and orchestration of resource functions for compute, network, storage and VM. Provides flexibility and ability to respond to the latest features and requirements of complex network components. Virtualized Infrastructure Manager (VIM) is responsible for controlling and managing NFVI resources. It controls interactions between VNFs and NFVI hardware components and has the required implementation and virtualization layer monitoring tools. Examples of VIMs are OpenStack, OPNFV and Kubernetes. The VNF manager manages the life cycle of VNF instances. It is responsible for initiating, updating, testing and terminating VNF. Therefore, each VNF instance must be linked exclusively to the VNF manager. The third component of MANO is NFV orchestration. NFVO is at the forefront of NFVI resources across multiple VIMs and manages the life cycle of network services, including policy management, performance measurement, scheduling, and tracking.

## **2.4. OSS/BSS layer**

Operational Support Systems (OSS) are software applications that support activities within the telecommunication network, provide and maintain customer service. OSS and BSS look for constant adaptation, updating, optimization and enhancements, so that all services communicate and work together.

## **3. SECURITY IN CLOUD COMPUTING**

An essential goal of security in cloud computing is to share resources between multiple users or programs safely. With virtualization, we get an architecture where physical hardware can be fully utilized for more distributed logical units of operating systems and applications. Virtualization in one hand protects the system because we have distributed logical units, but on the other hand, that specificity may indicate more significant exposure to attacks. Virtual

systems are as vulnerable as physical systems because they contain every segment of the ordinary system. The biggest problem in the cloud computing is security. To be more specific, data security. Today, we have a massive demand for cloud services, which also leads to more frequent attacks. According to Gartner, over the next decade public cloud infrastructure as a service will have at least 60% fewer security incidents than traditional data centers. Subbaiah Venkata, a Google engineer, explained why. With an extensive database of users the public cloud can learn and if an attack on a particular user happens, the solution can be applied to all other users. Security can be achieved through data tracking, machine learning algorithms, where alarms occur for each oscillation.

## **4. NETWORK SECURITY IN CLOUD COMPUTING**

### **4.1. Virtual network**

Virtual networks sit above physical networks and have a logical network structure independent of physical. A significant advantage is their security and flexibility. VPN is used for secure Internet communication and it supports a private network over the public network. Today, VPN is the fundamental component for secure communication in business environments.

### **4.2. Virtual Machine Security**

VMs are a subject to all attacks like physical hardware. One of the most critical security features is secure communication between virtual machines. Although virtual machines are separate one from another, they share resources such as memory, CPU, RAM, etc. An essential thing in virtualization is isolation. It prevents a virtual machine from affecting another if it runs on the same server. Isolation can be flexibly set due to the different needs within the organization, leading to new problems of VM safety. It is necessary to restrict traffic from one VM to another, the profiles must be limited, and the OS must always be up-to-date. It is also necessary to treat VM as a physical machine so that all security protocols are applied to it as well. No matter how many VMs are running on the same physical hardware, they must be isolated from each other. It is essential to set up a firewall to allow only protocols that are required for using a virtual machine. Best to access a virtual machine is through SSH protocols for Linux environments or RDS (Remote Desktop Services) for Windows. The security of the SSH protocol is based on the usage of cryptographic methods that allow the protection (confidentiality) of data that move through the insecure network. Besides, these methods can be used for checking the identity of the users involved in the communication and protecting the data from unauthorized modifications or preserving their integrity [3]. One of the major attacks on VMs is undoubtedly a guest escape. This situation may happen due to poor configuration or designing interactions between host and guest VMs. As the name says, VM leaves the boundaries of its virtual instance. The VM also separates itself from the hypervisor or Virtual Machine Manager (VMM) that manages the VMs or can be taken by the attacker. This brings the attacker access to other VMs that are on the same host and the attacker can leave the VM environment, thus having access to data from other resources and devices. Migration of VMs is a great feature of virtualization, but it can be risky because data, integrity, and VMs are then vulnerable to attacks [4].

### **4.3. Hypervisor security**

The central part of virtualization is VMM or hypervisor. The management and isolation of VMs depend on it. One way to protect hypervisors is to implement LDAP (Lightweight Directory Access Protocol). There are two types of hypervisors. We should consider the advantages and disadvantages of each type. According to the CCSP (ISC), bare-metal hypervisor is a better solution because it sits on the hardware while the other type runs on the operating system. There is a lower possibility of an attack.

A good practice is to update the hypervisor. Also, a good security solution is the VLAN reservation, for isolation of interface to separate data, application and management traffic. Routing VLANs should not perform a virtual switch and all traffic should go through the firewall [5]. The hypervisor needs to be protected from any unauthorized access. DoS (Denial of Service) is one of the most famous and most common attacks. Most often, the DoS attack is executed so that the server loads with a large number of requests that the server can no longer fulfill its primary duty. One of the worst attacks on the hypervisor is hyperjacking. This is done by installing a new hypervisor that takes control of the server, and it is difficult to detect this type of attack. If successful, attacker can gain complete control over the virtual environment.

## **5. ANSIBLE**

Ansible is a tool that can be used to automate the most complex environments. It is suitable for the configuration, orchestration, the implementation of the software, updates and other advanced tasks using a simple and human readable language. It is very adjustable, therefore can be beneficial for small and grand environments. There is a big emphasis on simplicity. However, safety and reliability are an essential part of Ansible. OpenSSH protocol is used for increased security because OpenSSH is one of the most peer-reviewed open source components. Ansible relies on OS credentials to control access to remote computers and, if necessary, can connect with SSH, Kerberos, LDAP or some other protocol for user authentication. Passwords are supported using an SSH key with an SSH agent, which makes it very simple to secure and enable authentication. Root logging is not required, can be connected via user or "sudo" user. Ansible's architecture consists of inventory, modules, plugins, and playbooks. The Inventory is a simple INI file that contains all the machines that are managed in the groups, defined by us. Essentially it is a host file. Ansible works by connecting to your nodes and pushing out small programs, called "Ansible modules" to them. These programs are written to be resource models of the desired state of the system. Ansible then executes these modules (over SSH by default) and removes them when finished. [6] Plugins are part of the code that increases the functionality. There are many useful plugins which you can use or you can write your own. Playbooks are YAML files. They can be written in any text editor and are a configuration management base on one or more machines. Roles, which contain tasks, can run on an assigned group of servers. They include tasks or commands that we execute by running a playbook. After a playbook is executed, we get a detailed printing of the machines that are covered, the order of the tasks and the print which has not been changed. Within the playbook we can have handlers that are performed at the end of the script, live in the global namespace, and are run by tasks. The keyword for running the handler is "notify". No matter how many such lines are in the playbook or task, they will only run once at its end. The main reason for creating a script is to automate a job that will be executed more than once.

### **5.1. The script for configuring "sshd\_config" file**

The script for changing the configuration file "sshd\_config" changes and adds lines to increase the security of the SSH protocol. SSH protocol is used for a connection to the remote server. The configuration file is located on the "etc/ssh/sshd\_config" path and only root or sudo user can make changes. It contains the location of host key and user authorization key. The script is divided into three tasks: changing the line, adding lines by finding the keyword and changing lines if the condition (true) is satisfied. Three different tasks give us different ways to change a file. Ansible is smart enough to understand what exactly is required. It is not necessary to set special terms if we have a different situation, he will search for keywords. If the word or phrase in module "line" is satisfied, Ansible looks for alternative under "replace" or "lineinfile" modules. The first task "Hardening sshd\_config - change", with the "replace" module, will change all instances within a specified string in the file.

The second "replace" means a specific string that will be changed with the string defined by the "regex" keyword. "Regex" is a regular expression that is searched within a file, and it is necessary within the "replace" module. "With\_items" is used if we have more regular expressions to change in a file. The "lineinfile" module is used to manage lines in a file, it is used to change one line in a file or replace it with another, to replace multiple lines, a "replace" module is recommended. This module has many interesting parameters that can be included, for example, "insertafter" or "insertbefore" are used to precisely specified where a new line needs to be inserted. The "Hardening sshd\_config - Looks and Change" task uses the "lineinfile" modules but in combination with the "backrefs" parameter. If the expression "regex" is in the file it will be replaced with a new expression, if there is no expression, nothing changes, and the parameters "insertafter" or "insertbefore" will be ignored [7]. The first change in the script refers to "PermitRootLogin". The best practice is not to log in with the root user but through the user account and use the sudo user. Protocol X11 is the older network protocol for remote access to applications. It is unsafe, so it is better to shut it down. In order to protect against external attacks, it is best to set the maximum number of user login attempts with "MaxAuthTries 3". The best practice is to take a new version of SSH protocol "Protocol 2" rather than to use the older version 1, a version that is no longer supported. The line with "IgnoreRhosts = yes" refers to circumventing the bad authentication method, we also are changing the line "IgnoreUserKnownHosts yes" ignored "users ~ / .ssh / known\_hosts ", we are sure the hosts will be set up by the administrator rather than any user. The "ClientAliveInterval 50" line goes over the encrypted channel, and the server will send a secure message to the client and expect an answer. A number in the line indicates how many times sshd will send a request before dropping the connection. "ClientAliveCountMax" and previous lines are interconnected, the product of the multiplication of these two numbers indicates the length of the session before termination. It is not recommended to be zero because it means an infinite session. Using "ciphers", we configure encryption algorithms. The keyword line "LogLevel" comes with the value "info", we should change it to "verbose" to record fingerprint for each SSH key. Possible values for "LogLevel" are quiet, fatal, info, verbose, error, debug. "AllowTcpForwarding no" and "PermitTunnel no" are set for the risk that the user will use SSH tunneling to open the back door and gain access to a VM from a location [8].

#script for sshd\_config file

root@fuelhost1:/etc/ansible/roles/test\_sshd/tasks#cat main.yml

- name: Hardening sshd\_config – change

replace:

dest: /etc/ansible/ssh-test/sshd\_config

regex: "{{ item.regex }}"

replace: "{{ item.replace }}"

with\_items:

- { regex: 'PermitRootLogin prohibit-password', replace: 'PermitRootLogin no'}

- { regex: '#IgnoreUserKnownHosts yes', replace: 'IgnoreUserKnownHosts no'}

- { regex: 'X11Forwarding yes', replace: 'X11Forwarding no'}

- { regex: 'LogLevel INFO', replace: 'LogLevel VERBOSE'}

- { regex: '#Banner /etc/issue.net', replace: 'Banner=/etc/issue.net'}

notify: restart sshd

- name: Hardening sshd\_config – add

lineinfile:

dest: /etc/ansible/ssh-test/sshd\_config

line: '{{ item }}'

with\_items:

```
- 'AllowAgentForwarding no'
- 'AllowTcpForwarding no'
- 'MaxAuthTries 3'
- 'ClientAliveInterval 900'
- 'ClientAliveCountMax 2'
- 'PermitTunnel no'
- 'Ciphers="aes256-ctr,aes192-ctr,aes128-ctr"'
- 'MACs="hmac-sha2-512-etm@openssh.com,hmac-sha2-512,hmac-sha2-256-
etm@openssh.com,hmac-sha2-256,umac-128-etm@openssh.com,umac-128@openssh.com"'
- 'UseDNS=no'
- 'Port 22'
- 'Protocol 2'
- 'HostbasedAuthentication=no'
- 'IgnoreRhosts=yes'
- 'UsePrivilegeSeparation=yes'
- 'StrictModes=yes'
- 'TCPKeepAlive=yes'
notify: restart sshd
```

- name: Hardening sshd\_config – search and alter

#add line module

lineinfile:

#path to file destination

dest: /etc/ansible/ssh-test/sshd\_config

#searched expression

regexp: "{{ item.regexp }}"

#replace regexp

line: "{{ item.lines }}"

#flag set to yes

backrefs: yes

#multiple expression parameter

with\_items:

```
- { regexp: 'Port', lines: 'Port 22' }
- { regexp: 'Protocol', lines: 'Protocol 2' }
- { regexp: 'HostbasedAuthentication', lines: 'HostbasedAuthentication=no' }
- { regexp: 'IgnoreRhosts', lines: 'IgnoreRhosts=yes' }
- { regexp: 'UsePrivilegeSeparation', lines: 'UsePrivilegeSeparation=yes' }
- { regexp: 'StrictModes', lines: 'StrictModes=yes' }
- { regexp: 'TCPKeepAlive', lines: 'TCPKeepAlive=yes' }
```

notify: restart sshd

## 6. CONCLUSION

The network security is most talked topic in the IT community for a reason. Everybody needs to pay attention, ordinary users (citizens) and large companies in equal measure. Without well-established security system and a well-thought-out design of an environment, problems can multiply very quickly. In this paper it is presented how NFV changed the game, the importance of network security in the cloud and introduction to Ansible, powerful automatization tool. Combination of a well-thought system and Ansible we can get easily configurable and secure environment. The SSH protocol provides a high-level of security for all users.

It can be used on all Linux operating platforms. The SSH protocol is an extremely important part of securing access to the infrastructure resources and it must be well-configured. If the configuration goes over the Ansible playbook, it gives us a simple system automation. This article presents how an efficient Ansible can be used for configuration of any environment. Using different modules, plugins and inventories helps building the secure environment on any platform.

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## ACCOUNTING INDEBTEDNESS OF LISTED COMPANIES IN CROATIA

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### ABSTRACT

*Entrepreneurs face a lot of problems in their business. Problems with solvency and over-indebtedness are the biggest obstacles for further business development. All of the EU countries have implemented the Directive 2011/7/EU on combating late payments in commercial transactions, but obviously, this is not enough. In Croatia, a number of legal regulations are enforced in order to introduce financial discipline, but there is still no complete implementation of these legal regulations. The main objective of this paper is to compare the Debt ratio, Debt to Equity Ratio, Equity Ratio and Indebtedness Factor, in order to determine if Croatia has managed to recover from the financial crisis and reach business levels as those before the crisis has begun. The research was conducted based on information obtained only from the financial statements of listed companies on Zagreb Stock Exchange in 2017, 2012 and 2008. The results of the research have shown that the indicators are improving but that in the year 2017 they haven't reached the levels before the financial crisis.*

**Keywords:** *Debt ratio, Debt to Equity Ratio, Equity Ratio, Indebtedness Factor, Insolvency*

### 1. INTRODUCTION

Croatian companies are struggling to survive each day on the Croatian or world market. The biggest business problem is the maintenance of liquidity and solvency caused by unpaid bills within maturities, creating a vicious cycle between buyers and suppliers of the state. The financial crisis, which began in the US with the fall of the US mortgage lending market in the middle of 2007, turned into a 2008 global crisis. In Croatia, crisis has further slowed down the growth of the economy and deepened the problem of indebtedness and impossibility of settling liabilities. The halt of economic growth has led to a decline in production and consumption, a fall in BPD and the rise in unemployment. The main objective of this paper is to compare the indicators from the financial statements of listed companies on the Zagreb Stock Exchange for three years 2017, 2012 and 2008 in order to explore:

- the situation in the listed companies in the three most significant periods
- if Croatia has managed to recover, based on the indicators of the listed companies and find out if the situation in 2017 is better than the 2012 and 2008.
- if the legal regulations have succeeded in introducing financial discipline into the business of Croatian entrepreneurs and decreasing over-indebtedness.

Debt ratio, Equity Ratio, Debt to Equity Ratio and Indebtedness Factor are the main indicator used in the paper. The calculations are made based only on the information presented and included in the financial statements.



However, what is more problematic is the indebtedness of Croatian companies that is not presented in financial statements and balance sheets, but present the off-balance debts, i.e. mutual guarantees and guarantees on loans and loans of other affiliated companies.

## 2. CONCEPTUAL FRAMEWORK

The economy in Croatia has experienced numerous oscillations over the last decade, primarily due to illiquidity and over-indebtedness. Many papers have been published about financial indicators of solvency, insolvency and bankruptcy. The research (Šverko Grdić, Kristinić Nižić & Mamula 2017) analyses the financial data for the period 1996–2014 and provides evidence that the insolvency of Croatian companies increased with the global financial crisis. According to the definition, solvency is the ability of a company to meet its debt and other obligations in the long run (Belak, 1995, Brealey, Myers & Marcus, 2007, Gryglewicz, 2011) or company is in a state of full solvency when its entire property (assets) is in the form of cash or cash equivalents (Kosmidis & Stavropoulos, 2014). Many Croatian authors (Benić, 2012, Buturac, Rajh, & Teodorović, 2009) warn about the insolvency problem and negative macroeconomic trends in the Croatian economy. Many companies and businesses failed, despite the demand on the market, resulting in a significant growth of unemployment. Still, these changes were not caused solely by insolvency, however significant its role, but also by mostly difficult restructuring processes of the economy and society as a whole (Simić, Kovačević, & Simić 2011). In the paper (Martinis, Ljubaj, 2017, p.3) refer to other authors' research like as Lawless et al. (2014), Damijan (2014,2016) and Kuchler (2015). Lawless et al. (2014) that identified the negative impact of excessive debt on small and medium-sized businesses in Ireland; research (Damijan 2014) concludes that, for Slovenian companies, over-indebtedness and weaker debt servicing capacity impede productivity growth of enterprises, exports, employment and investment. In the other research Damijan (2016) re-establishes the negative impact of over-indebted companies on business results, employment, investment and exports for six Central and Eastern European countries (including Croatia). In his research Kuchler (2015) finds that the high indebtedness of companies in Denmark contributed to the reduction of investments, especially in small and medium-sized enterprises. In the research (Roška, Remlein, 2018, p.527) the average Croatian and Polish debt to equity ratio for 2015 and 2016 is calculated, which shows that the ratios in Croatia (2.19 for 2016 and 1.84 for 2015), are higher than average ratios in Poland (1.57 for 2016 and 1.10 for 2015). In the paper (Martinis, Ljubaj, 2017) is confirmed that indebtedness is one of the main obstacles of economic recovery. In Croatia, three laws regulate the payments and solvency or insolvency: Financial Operations and Pre-Bankruptcy Settlement Act (2012 to 2015), Bankruptcy Act (2017) as well as the Law on Extraordinary Administration Procedure for Companies of Systemic Importance for the Republic of Croatia (2017). According to the data published on IUS-INFO, starting from 2012 to 2018, 10,749 compulsory settlements proceedings were started, but only 2,7802 compulsory settlements were concluded. The Bankruptcy Act prescribes how to cash out the assets and allocate the funds collected to the creditors. Reasons for bankruptcy are the inability to pay and being overdue. The Law on Extraordinary Administration Procedure for Companies of Systemic Importance for the Republic of Croatia (2017) so called "Lex Agrokor". The Extraordinary Administration took over the management of Agrokor Group and through 14 month long a process tried to find an agreement with suppliers, lenders, and creditors. More than 5700 Agrokor's creditors filed nearly \$ 58 billion in claims. Agrokor's Creditors' Settlement Plan was approved for 80.20 percent of total claims on 4th July 2018. The High Commercial Court dismissed or refused 87 appeals made by the creditors to the Commercial Court's decision. Confirmed by the High Commercial Court in October 2018, the Creditors' Settlement Plan became final.

### 3. THE GOALS, BASIS, AND HYPOTHESIS OF THE RESEARCH

The research described in this paper is based on information obtained from the financial statements of 104 companies listed on Zagreb Stock Exchange in 2017, 2012 and 2008. "Profitability and indebtedness are two key categories for every analysts" (Belak, 2014. p.179). In the research the following Solvency ratios or Leverage ratios were calculated: the Debt Ratio, the Equity Ratio, the Debt to Equity Ratio and the Indebtedness Factor. Ratios are calculated according the formulas shown in table 1.

*Table 1: Ratios calculation*

Description	Numerator	Denominator
Debt Ratio	Total Debts	Total Assets
Equity Ratio	Total Equity	Total Assets
Debt to Equity Ratio	Total Debts	Total Equity
Indebtedness Factor	Total Debts	Net Profit + Depreciation + Amortization

*Source: Author's according to literature*

The Debt Ratio is the ratio of total debt to total assets. Debt ratios can determine the overall level of financial risk for a company. The higher the amount of debt of a company, the higher is the potential level of financial risk. The optimal debt ratio is 50% or less. In every analysis of the companies it is necessary to consider industry specificity. If the ratio is less than 50%, most of the company's assets are financed through equity. If the ratio is greater than 50%, most of the company's assets are financed through debt. The second is Equity Ratio which measures the amount of assets that are financed by owners' comparing the total equity in the company to the total assets. The optimal Equity ratio is 50% or higher. The third ratio is Debt to Equity Ratio, which compares a company's total debt to total equity. The debt to equity ratio shows how much of company's financing comes from creditors and how much from investors. A higher debt to equity ratio indicates that more creditor financing is used than owners financing. The optimal debt to equity ratio is 1. The fourth ratio is indebtedness factor. This factor is the best indicator of survival in business, or a bankruptcy indicator. The indebtedness factor shows how much time it takes to get the total liabilities out of the profit plus the depreciation. The control measure for this indicator is 5 years (Belak, 2010). If the company can pay all their debts in 5 years it is solvent company. The main hypothesis is:

- The mean indebtedness indicators of listed companies in Croatia, for 2017, 2012 and 2008 are far from optimal ratio and they did not reach business levels as those before the crisis has begun.

The following statistical hypotheses are used for confirmation of the main hypothesis:

The first statistical hypothesis:

- **H0:** There is not a statistically significant difference in Debt Ratio depending on which year ratio is calculated
- **H1:** There is a statistically significant difference in Debt Ratio depending on which year ratio is calculated

The second statistical hypothesis:

- **H0:** There is not a statistically significant difference in Equity Ratio depending on which year ratio is calculated
- **H1:** There is a statistically significant difference in Equity Ratio depending on which year ratio is calculated

The third statistical hypothesis:

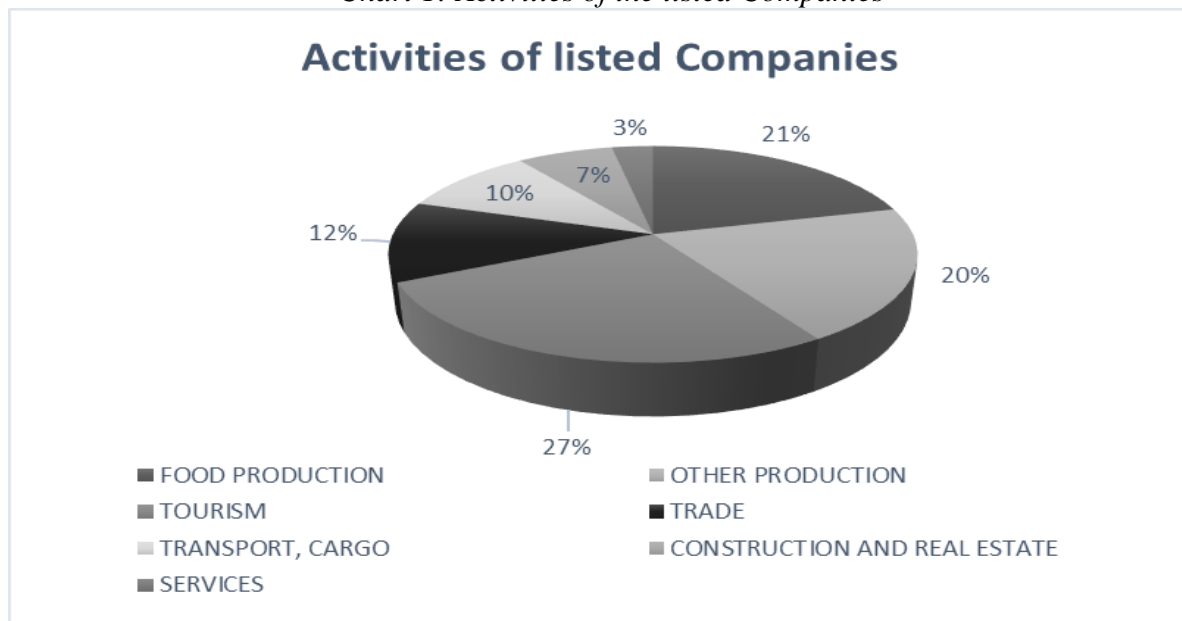
- **H0:** There is not a statistically significant difference in Debt to Equity Ratio depending on which year ratio is calculated
- **H1:** There is a statistically significant difference in Debt to Equity depending on which year ratio is calculated
- The fourth statistical hypothesis:
- **H0:** There is not a statistically significant difference in Indebtedness Factor depending on which year ratio is calculated
- **H1:** There is a statistically significant difference in Indebtedness Factor depending on which year ratio is calculated

For the statistical analysis, this paper uses Descriptive Analysis, Nonparametric test like as Friedman test and Wilcoxon signed-rank test. The statistical study used the software IBM SPSS.

#### 4. EMPIRICAL RESULTS

In 2017, 67% listed companies finished financial year with profit, according to the 49% of listed companies in 2012 and 63% of listed companies in 2008. In Chart 1 is visible that 27% of companies are coming from touristic sector, 21% from food production sector and 20% from other than food production sector.

*Chart 1: Activities of the listed Companies*



*Source: Author's*

The results of leverage indicators in 2017, 2012 and 2008 for Croatia and are shown in Table 2. Debt Ratio needs to be 50% or less. The average Debt Ratio in 2008 was 45.006%, interval for mean was from 49.863 to 83.162%. In 2012, the average Debt Ratio was 135.235%, interval was from -19.167% to 289.638%. The year 2012 was a year when the government realized that they needed to take some action to decrease debts and save the companies and implemented the pre-bankruptcy settlement. In 2017 the average Debt Ratio was 66.513%, which shows that the companies have slowly recovered from financial crises. The interval of Debt ratio was from 49.863 to 83.162. In 2017 in tourism sector Debt Ratio was 37.923%, and in services were 40.285%.

According to Debt Ratio we can conclude that our economy has not yet recovered and reached level of 2008. Equity Ratio needs to be 50% or higher. The best Equity Ratio in 2008 was 50.967%, from 44.963% to 56.970%. In 2012 average ratio was 43.648%, from 32.840% to 54.455%. In 2017 the average ratio was 35.801% from 16.373% to 55.229%. From this result is visible that the financing from equity is decreasing. In 2017 only service activities (57.041%), and transport activities (77.757%) have equity ratio bigger than 50%. The Debt to Equity Ratio in 2017 was 3.625 from -.764 to 7.934, in 2012 was 1.710 from 1.245 to 2.176 and in 2008 was 1.367 from 0.941 to 1.792. Ideal ratios need to be 1. In 2017 in tourism sector D/E ratio was 0.734 and in food production was 0.997. The Indebtedness Factor in 2017 was 13.943 from -20.007 to 46.377, in 2012 was -11.870 from -26.668 to 2.929 and in 2008 was 633.009 from -501.210 to 1767.228. Ideal ratios need to be 5. In 2012 result is negative because 51% of listed companies finished the financial year with loss. In 2017, transport services can cover their debts in 1.021 year and service sector in 2.729 year.

Table 2: Average Indebtedness Ratios according to the Activities in 2017, 2012 and 2008

		N	Mean 2017	N	Mean 2012	N	Mean 2008
<b>DEBT RATIO</b>	FOOD PROD.	22	79.719	22	63.428	22	51.882
	OTHER PROD.	21	88.997	21	57.426	21	54.463
	TOURISM	28	37.923	28	41.303	28	37.585
	TRADE	12	93.454	12	100.815	12	47.495
	TRANSPORT	11	46.295	11	39.956	11	43.026
	CONSTRUC., R.E.	7	68.736	7	1200.57	7	37.677
	SERVICES	3	40.285	3	84.452	3	12.069
	<b>Total</b>	<b>104</b>	<b>66.513</b>	<b>104</b>	<b>135.235</b>	<b>104</b>	<b>45.006</b>
<b>EQUITY RATIO</b>	FOOD PROD.	22	19.250	22	51.125	22	51.711
	OTHER PROD.	21	7.532	21	40.910	21	38.924
	TOURISM	28	77.757	28	56.812	28	61.142
	TRADE	12	4.199	12	-2.828	12	40.449
	TRANSPORT	11	49.249	11	56.045	11	56.821
	CONSTRUC., R.E.	7	28.732	7	50.168	7	54.195
	SERVICES	3	57.041	3	10.342	3	47.911
	<b>Total</b>	<b>104</b>	<b>35.801</b>	<b>104</b>	<b>43.648</b>	<b>104</b>	<b>50.967</b>
<b>DEBT/EQUITY RATIO</b>	FOOD PROD.	21	.997	22	1.348	22	1.088
	OTHER PROD.	19	1.751	20	2.362	20	1.329
	TOURISM	28	.734	26	1.012	27	.685
	TRADE	8	1.428	10	2.509	12	2.038
	TRANSPORT	10	20.174	11	1.700	11	2.424
	CONSTRUC., R.E.	5	1.783	7	2.820	7	1.811
	SERVICES	3	10.247	2	.426	3	2.203
	<b>Total</b>	<b>94</b>	<b>3.625</b>	<b>98</b>	<b>1.710</b>	<b>102</b>	<b>1.367</b>
<b>INDEBTEDNESS FACTOR</b>	FOOD PROD.	22	7.963	22	-1.256	22	72.055
	OTHER PROD.	21	83.393	21	-2.188	21	3024.214
	TOURISM	28	7.434	28	-13.716	28	-8.922
	TRADE	12	-49.048	12	-39.675	12	53.921
	TRANSPORT	11	1.021	11	-23.861	11	8.714
	CONSTRUC.,R.E.	7	-16.483	7	-1.335	7	32.799
	SERVICES	3	2.729	3	-9.641	3	5.511
	<b>Total</b>	<b>104</b>	<b>13.943</b>	<b>103</b>	<b>-11.870</b>	<b>104</b>	<b>633.009</b>

Source: Author's

The results of the Friedman Test for Debt Ratio are shown in Table 3. There is a statistically significant difference in Debt Ratio depending on which year ratio is calculated  $\chi^2(2) = 8.308$ ,  $p = 0.016$ . Because  $p < 0.05$  we will reject the first null hypothesis.

*Table 3: Descriptive Statistics and Friedman Test for Debt Ratio*

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50th (Median)	75 <sup>th</sup>
DEBT RATIO 2017	104	66.513	85.612	1.71	744.55	29.923	46.428	69.527
DEBT RATIO 2012	104	135.235	793.947	5.10	8126.97	27.739	47.245	69.193
DEBT RATIO 2008	104	45.006	35.906	1.41	253.83	22.509	40.836	56.176

**Friedman Test**

Ranks	
	Mean Rank
DEBT RATIO 2017	2.12
DEBT RATIO 2012	2.12
DEBT RATIO 2008	1.77

Test Statistics <sup>a</sup>	
N	104
Chi-Square	8.308
df	2
Asymp. Sig.	.016

a. Friedman Test

*Source: Author's*

The result of the Friedman Test for Equity Ratio is shown in Table 4. There is a no statistically significant difference in Equity Ratio depending on which year ratio is calculated.  $\chi^2(2) = 1.788$ ,  $p = 0.409$ . Because  $p > 0.05$  we will accept the second null hypothesis.

*Table 4: Descriptive Statistics and Friedman Test for Equity Ratio*

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50th (Median)	75th
EQUITY RATIO 2017	104	35.801	99.900	-661.27	530.54	28.752	52.310	69.108
EQUITY RATIO 2012	104	43.648	55.574	-430.92	94.90	29.020	52.235	68.734
EQUITY RATIO 2008	104	50.967	30.870	-158.95	113.19	36.475	51.963	70.332

**Friedman Test**

Ranks	
	Mean Rank
EQUITY RATIO 2017	1.96
EQUITY RATIO 2012	1.93
EQUITY RATIO 2008	2.11

Test Statistics <sup>a</sup>	
N	104
Chi-Square	1.788
df	2
Asymp. Sig.	.409

a. Friedman Test

*Source: Author's*

According to the Friedman Test for Debt/Equity Ratio shown in Table 5, there is a no statistically significant difference in Debt to Equity Ratio depending on which year ratio is calculated.  $\chi^2(2) = 1.238$ ,  $p = 0.538$ . Because  $p > 0.05$  we will accept the third null hypothesis.

*Table 5: Descriptive Statistics and Friedman Test for Debt/Equity Ratio*

	N	Mean	Std. Deviation	Min.	Max.	Percentiles		
						25th	50 <sup>th</sup> Median	75th
DEBT/EQUITY RATIO 2017	84	3.429	21.289	.02	195.89	.397	.712	1.481
DEBT/EQUITY RATIO 2012	84	1.517	2.164	.05	11.95	.357	.785	1.563
DEBT/EQUITY RATIO 2008	84	1.078	1.151	0.00	6.16	.343	.705	1.323

**Friedman Test**

Ranks	
	Mean Rank
DEBT/EQUITY RATIO 2017	1.98
DEBT/EQUITY RATIO 2012	2.10
DEBT/EQUITY RATIO 2008	1.93

Test Statistics <sup>a</sup>	
N	84
Chi-Square	1.238
df	2
Asymp. Sig.	.538

a. Friedman Test

*Source: Author's*

The Friedman Test result for Indebtedness Factor are shown in Table 6, there is a statistically significant difference in Indebtedness Factor depending on which year.  $\chi^2(2) = 6.288$ ,  $p = 0.043$ . Because  $p < 0.05$  we will reject the fourth null hypothesis.

*Table 6: Descriptive Statistics and Friedman Test for Indebtedness Factor*

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50 <sup>th</sup> (Median)	75th
INDEBTEDNESS FACTOR 2017	104	13.943	170.661	-442.92	1651.77	1.272	3.843	10.428
INDEBTEDNESS FACTOR 2012	104	-11.870	76.095	-606.27	119.81	-8.780	1.636	7.947
INDEBTEDNESS FACTOR 2008	104	633.009	5832.21	-142.86	59397.33	.488	4.961	15.107

**Friedman Test**

Ranks	
	Mean Rank
INDEBTEDNESS FACTOR 2017	1.98
INDEBTEDNESS FACTOR 2012	1.84
INDEBTEDNESS FACTOR 2008	2.18

Test Statistics <sup>a</sup>	
N	104
Chi-Square	6.288
df	2
Asymp. Sig.	.043

a. Friedman Test

*Source: Author's*

According to the Friedman Test only Debt Ratio and Indebtedness ratio have shown statistically significant difference in the value of the Ratio between the years. Before we continue with Post hoc analysis with Wilcoxon signed-rank test, we need to conduct Bonferroni correction. A Bonferroni adjustment on the results from the Wilcoxon tests is necessary because we are making multiple comparisons and we could make a Type I error, meaning that we could declare a result significant when we should not (a Type I error). In the calculation of Bonferroni adjustment, we will take the significance level which we initially used (in this case. 0.05) and divide it by the number of three tests what we are running. Thus, in this example. we have a new significance level of  $0.05/3 = 0.017$ . This means that if the  $p$  value is larger than 0.017. we do not have a statistically significant result. The result of the Wilcoxon signed-rank tests for Debt Ratio is shown in Table 7. There was a statistically significant difference in Debt Ratio depending on the year.  $\chi^2(2) = 8.308$ ,  $p = 0.016$ . Post hoc analysis with Wilcoxon signed-rank tests was conducted with a Bonferroni correction applied. resulting in a significance level set at  $p < 0.017$ . Median (IQR) Debt Ratio for the 2017 was 46.428 (29.924 to 69.527). for the 2012 was 47.245 (27.739 to 69.194). for the 2008 was 40.836 (22.509 to 56.176). There were no significant differences between the Debt Ratio 2012 vs 2017 ( $Z = -.159$ ,  $p = 0.874$ ). However, there were a statistically significant differences in the Debt Ratio in 2008 vs. 2017 ( $Z = -3.019$ ,  $p = 0.003$ ) and in 2008 vs 2012 ( $Z = -3.441$ ,  $p = 0.001$ ).

*Table 7: Wilcoxon Signed-Ranks Tests for Debt Ratio*

	DEBT RATIO 2012 – DEBT RATIO 2017	DEBT RATIO 2008 – DEBT RATIO 2017	DEBT RATIO 2008 – DEBT RATIO 2012
<b>Z</b>	-.159 <sup>b</sup>	-3.019 <sup>b</sup>	-3.441 <sup>b</sup>
<b>Asymp. Sig. (2-tailed)</b>	.874	.003	.001

b. Based on positive ranks.

*Source: Author's*

The result of the Wilcoxon signed-rank tests for Indebtedness Factor is shown in Table 8. There was a statistically significant difference in Indebtedness Factor depending on the year.  $\chi^2(2) = 6.288$ ,  $p = 0.043$ . Post hoc analysis with Wilcoxon signed-rank tests was conducted with a Bonferroni correction applied. resulting in a significance level set at  $p < 0.017$ . Median (IQR) Indebtedness Factor for the 2017 year was 3.843 (1.272 to 10.428). for 2012 year was 1.636 (-8.780 to 7.947) and for 2008 year was 4.961 (.488 to 15.107) respectively. There were no significant differences between the Indebtedness Factor in 2012 vs 2017 ( $Z = -1.339$ ,  $p = 0.180$ ) or between the 2012 vs 2017 ( $Z = -1.450$ ,  $p = 0.147$ ). However. there was a statistically significant reduction in Indebtedness Factor in 2008 vs 2012 ( $Z = -3.155$ ,  $p = 0.002$ ).

*Table 8: Wilcoxon Signed-Ranks Tests for Indebtedness Factor*

	INDEBTEDNESS FACTOR 2012 INDEBTEDNES FACTOR 2017	INDEBTEDNESS FACTOR 2012 INDEBTEDNES FACTOR 2017	INDEBTEDNESS FACTOR 2008 INDEBTEDNES FACTOR 2012
<b>Z</b>	-1.339 <sup>b</sup>	-1.450 <sup>c</sup>	-3.155 <sup>c</sup>
<b>Asymp. Sig. (2-tailed)</b>	.180	.147	.002

b. Based on positive ranks.

c. Based on negative ranks.

*Source: Author's*

## 5. CONCLUSION

EU institutions and member states faced the financial crisis and took all possible measures to mitigate its effects and overcome the weaknesses of the Economic and Monetary Union. All of this has yielded results and some states began to emerge from the crisis of 2012. Croatian economy, if judged by the results of the listed companies on the Zagreb Stock Exchange, is slowly recovering, but has not yet reached its best years before the crisis. All measures designed to introduce the order in payments are implemented too slowly and do not lead to the desired goal of establishing financial discipline for all companies and under the same conditions. All indebtedness indicators of the listed companies on the Zagreb Stock Exchange would be less favourable in case that all debts are taken into account, the ones recorded and presented in financial statements and the off- balance debts i.e. various guarantees for other companies in the group. The main problem is that all such debts are often not recorded. In further research, it is necessary to follow the investigated indicators with special emphasis on tracking financial discipline and payments within 30 and 60 days. If financial discipline was to be strengthened, it would enable faster recovery and development of entrepreneurship.

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## PARADOX OF OIL REVENUE AND THE ECONOMIC RETARDATION IN NIGERIA 2005-2017

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### **ABSTRACT**

*Observation has shown that since independence the Nigeria economy is heavily dependent on Petroleum export to finance the economy but with recent fluctuation in the price of crude oil in the international market, financing capital projects has been a major challenge, resulting in borrowing, this has led to the retardation of the economy. This perennial problem has defied all government strategies taken to address this phenomenal. This study therefore is to determine whether oil revenue dependency is responsible for the economic retardation in Nigeria. The documentary research and ex-post facto design method was deployed. Data were generated from secondary sources and it deployed content analysis. The study observed that oil export is the only reliable source of revenue for government infrastructural financing in Nigeria. Recent price fluctuation in the international crude oil market has exacerbated the economic retardation in Nigeria, leading to economic recession. Therefore to avoid further economic retardation in Nigeria, we recommend the diversification of the economy from oil dependent to multi-facet economy with agriculture and manufacturing leading the way.*

**Keywords:** *Dependency, Corruption, Crude oil export, Foreign Direct Investment (FDI) and Development*

### **1. INTRODUCTION**

Nigeria's economic aspirations have remained that of altering the structure of production and consumption patterns, diversifying the economic base and reducing dependence on oil, with the aim of putting the economy on a part of sustainable, all-inclusive and non-inflationary growth has been a mirage (Sanusi 2010:1). The assertion highlights the problem of over reliance on mono-economy that is driven by import dependence and enveloped by unsustainable growth. Scholars believe it is paradoxical for the Nigeria economy to be retarded in the mix of increasing oil revenue over the years. The origin of this problem has been logically traced to faulty colonial economic architecture, this is the argument of some liberal Political-economy scholars, such as Ekeh, (1997), Ricardo (1975) among others. However some scholars noted that Nigeria was an agrarian State with over 95% of her population residing in rural communities, with agriculture as their main occupation across the length and breadth of the country, with remarkable economic growth. Beside a critical observation has shown that during the colonial era, agricultural account for over 80% of the Gross Domestic Product GDP with every section of the nation contributing to the National Income. For instance, the Western Region of Nigeria was famous for Cocoa production while East and Northern Regions producing Palm produce and Groundnut respectively. Idama (2009) noted that the agricultural sector was responsible for the developmental strive of the colonial government in the 1950s and 1960s, though it was restricted mostly to cash crops for export. However, the Nigeria economic narrative changed negatively with the discovery of oil in commercial quantity in 1957, in Oloibiri present day Bayelsa State. Agriculture the main stay of the economy was neglected for white collar jobs in the oil industry. Since then, emphases have been on oil production with its boom in 1970s. It is admissible that Nigeria, since then, has cultivated the mono-economy culture that heavily relied on oil revenue as its main income earner to the detriment of other sectors (Idama, 2014). Sanusi (2010) was quick to identify and link the changes in the economic architecture of the 1950s to

poor political structure as encapsulated in various coup d'état of the military. Besides, successive government beginning with the Gowon administration was not interested in restructuring and diversifying the economy but rather engaged in day-dreaming. Perhaps, successive military administration after Gowon did not observe the underperformance of the economy judging from the enormous resources endowment in Nigeria, rather they were all eager and engross in frivolous spending by building castles in the air. Some reasons advanced by Idama (2014) for this behaviour was that, the oil industry was not within the control of the Government and as such income from oil was regarded as free money that last forever. Judging from the recent Global Economic Recession, it was obvious that adequate attention was never given to economic development viz a viz the oil industry, rather all manner of approval were given to the operators of the oil industry in Nigeria, to import whatever they consider important to the oil industry. As if that was not bad enough, the Government Officials were gallivanting from one country to another pretending to be attending OPEC and other oil related meetings. And this is why scholars like Idama (2010), Sanusi (2010) and Akujuru (2015) noted that there is disequilibrium between economic growth and population growth rate as such the marginal growth in the economy could not induce the required structural transformation in the Nigeria economy. This problem as observed by scholars have led to the poor performance of the economy when juxtaposed with other countries such as China, India and Indonesia that were far behind Nigeria in terms of per capita in 1970s. It is an admissible truth that the decline in the Nigeria economy today is directly related to Global Political instability arising from oil revenue fluctuation. For instance, the political instability in the Mideast had direct impact on Nigeria economy development. Even at that, poor planning and poor oil revenue management has also implicated in the economic retardation. The core problem of the Nigeria economy is the inability of the Economic Management Team to effectively link the oil revenue to other key sectors of the economy, a factor that is critical to economic development. One other important problem identified as responsible for the economic decline during the period of oil boom of the 70s, was the ineptitude of the political leaders who lacked focus and vision for infrastructural development in Nigeria. Again, the ineptitude of these leaders also influenced the mismanagement of oil resources thereby laying the foundation for economic failure in Nigeria. Although corruption has been implicated in the failure of the Nigeria Economy, it has been domesticated in the Nigeria oil industry. Recent observations on the persistence of economic retardation in Nigeria, it shows that oil resources have displaced the more stable and sustainable revenue flows from the non-oil sector. This observation is anchored on the fact that oil revenue is subject to market forces. These market forces are not within the control of the Nigeria government thereby inhibiting effective planning. This argument have been over-boarded by scholar for lack of merit. Another identified problem is the tendency to de-emphasize income taxes as a source of government revenue. Copious studies have shown that tax collection has been neglected by the government for quick oil revenue. Besides, the low tax ratios and high consumption expenditures (typically on imported goods) reinforce inflationary tendencies, a common practice since the oil boom of the 1970s. In the recent past, studies have shown that the Nigerian tax payers no longer pay tax as a result of ineffective system of tax collection occasioned by corruption. Again copious studies has identified the problem of the "Dutch disease" which means resource booms tend to cause real exchange rates to rise due to the large inflows of foreign exchange generated by the increased in natural resource exports. However, extant explanation of Dutch Disease shows on the other hand that, labour and capital tend to migrate to the booming resource sector from the less attractive sectors thereby creating disequilibrium in the economy. These problems have led to the falling standard of living in Nigeria. The falling standard in 1990s also witnessed crude oil price fluctuation leading to decline in economic activities in Nigeria. One other important problem identified by scholars was the volatility of oil prices especially in the 2000s.

The fluctuating prices of crude oil in the international market between 2010 and 2015 have forced the Nigeria economy into recession. Observations have shown that market forces which are often times not within the control of the government have made economic planning difficult. It has also hampered economic growth and aggravates investment conditions, thereby making income distribution and development unattainable. Another challenge wrestling with the economy that is directly linked to oil revenue dependency is host communities agitation and militancy in the Niger Delta region. As it has been said, oil revenue is the life wire of the economy and any disruption may have inelastic effect on the economy. This is also predicted on the likelihood that further agitations may have an adverse effect on the social-political stability of the nation, judging from the trend and the persistency of the agitation. This study has observed the persistency of economic retardation as a result of over dependency on oil revenue and its attendant consequences on national development. However extant literatures have shown that very little attention has been paid to the diachronic study of Oil Revenue Dependence and Economic Retardation in Nigeria. And that is why the study have raised a fundamental question; how did oil revenue dependence responsible for the economic retardation in Nigeria? The objective of this study is to determine whether oil revenue dependence is responsible for the economic retardation in Nigeria. In order to address this problem, the study deploys ex-post facto design and data were generated from secondary sources, using content analysis as crux of the problem.

## **2. THEORETICAL FRAMEWORK**

This study deploys the Dependency and Resource Curse theory for the effective explanation of the Economic Retardation occasioned by the over dependency on oil revenue. The Dependency theory was propounded by Raul Prebisch in 1950. However, the theory was popularized by the American Economist Paul Baran in 1957. Paul Baran and his colleagues were worried by the fact that economic growth in the advanced industrialized countries did not lead to growth in the poorer countries, the reason being that poor countries exports primary commodities to the industrialized countries who then manufactured products out of those commodities and sold back to the poorer countries at a higher price. The consequences of this relationship Idama (2012) noted is the retardation of economic activity in the less industrialized countries, which often lead to serious import dependency in the poorer countries. To further buttress Paul Baran's assumption as cited in Scott et al (1999), he noted that the proponents of dependency theory contends that the asymmetrical power relations between countries of the world economic system reduces the developmental potential of the peripheral countries. Ferraro, (1996) opines that dependency theory posits that the cause of the low levels of development in less economically developed countries (LEDC's) of the world is caused by their reliance and dependence on more economically developed countries (MEDC's) of the world. In other words, Ferraro further stated that the less economically developed countries (LEDC's) are undeveloped because they rely on the more economically developed countries MEDC's. It is based on this that some proponents of dependency theory assert that LEDC's will remain less developed because the surplus that they produce will be siphoned off by MEDC's, under the guise of multinational corporations. Since the surplus is siphoned, there is, as such, no profit left for reinvestment and development of the host country. This is what they conceptualized as Economic Retardation. On the other hand, Resource Curse was first used by Richard's Aunty in 1993 to describe countries with rich natural resources yet poor as Resource Curse. This paradox is what Malomo (2008) and Ezirim (2008) described as Resource Curse because natural resources are supposed to aid economic development, therefore it is paradoxical the opposite. The theory also affirms that countries with abundance of natural resource may likely have lower economic growth rate than countries without abundance of natural resources. To further buttress this assumption, Jeffrey (2005) and Warner (2008), were able to link natural

resource abundance to poor economic growth in most less developed countries. They noted that there was a disconnection between natural resource and economic growth, which underpinned economic retardation in Nigeria. This can be explained by critically observing the Nigeria economy in relation to oil revenue. It has been observed that since 1970s oil revenue has been on the increase without corresponding increase in economic development in Nigeria. The Nigeria economic performance has been stagnated, because it is subjected to the whims and caprices of international oil prices, making the sector an enclave of the Developed World. The Nigeria oil industry is currently dominated by Oil multinationals whose interest is to repatriate every available capital through legal and illegal means. Available records have shown that oil revenue have influenced the retardation of the other sectors of the Nigeria economy. In other words, the Nigeria economic growth is directly linked to the international capitalist system, which oftentimes is manipulated infavour of the developed economy as represented by the Oil Multinationals; a strategy scholars identified as dependency syndrome.

### **3. THE PARADOX OF OIL REVENUE AND ECONOMIC RETARDATION**

In this section it is imperative to consider the various points of view on the influence of oil revenue on Nigeria economic development. Some scholars have seen the oil revenue as a blessing while others as a curse. The narrative on oil revenue seems to tint more to resource curse, judging from empirical evidence. However the focus of this section therefore is to demonstrate the influence of oil revenue on the Nigeria economy between 2005 and 2016. The United Nation Development Programme UNDP (2000) noted that "the extreme dependence of the Nigerian economy on crude oil has rendered it vulnerable to instability of market forces with grave implication to the nation's economic growth and development". This assertion is predicated on the assumption that the Nigeria economy is driven by single export commodity call oil. This single commodity is the life wire of the economy, generating billions of Dollars yearly. The Nigeria Extractive Industries Transparency Initiative (NEITI) report noted that the total financial flows from the oil and gas industry in Nigeria from 2009 to 2011 is \$143.5billion. The question is how did the income generated from oil influence economic development in Nigeria? Medee and Nembee (2011) noted that since 1960s the government have not been able to manipulate its fiscal policies to achieve certain desired macroeconomic goals, among others is economic growth. It is ubiquitous world-wide that for any economy to grow government must manipulate its income and expenditures to stimulate economic growth. One would have thought that the present administration under the leader of President Buhari would have redesigned the monetary policy to accommodate more public and private player in the economy. A critical analysis of the 2016 budget shows that the non-oil sector of the economy performed below expectation, in other words there is a consistent decline in growth rate from 5.59% in the first quarter of 2016 to 3.05% in the third quarter of the same year. Economic analysis believed that the decline is partly attributed to government cut back in both public and private spending, a policy that has help retard Nigeria economic growth. Most emerging economy of the World has been expiated for relying on importation for economic growth. Empirical data have shown that Nigeria economy is import dependent, for instance the National Bureau of Statistics noted that in 2015 there was fall in import value in the first quarter of 2015, with import value fall from 7.8% to 15.8% in the first quarter of 2016 representing decline in economic activities. We also observed a fall in export value in the same period from 34.6% to 52.3% indicating economic retardation despite increase in oil revenue, a situation Raul Prebisch referred to as Dependency. This is deeply rooted in the political-economy of most developing countries, which is orchestrated by the manipulative tendencies of the developed economy. In the same line of reasoning, Idama (2017) accused the Buhari administration of complying with the economic blue print of the developed economy that negates the protective interest of local businesses. He noted that, the Buhari administration has placed less emphasis on the economy,

but high premium on security with over 25% of the total budget for 2016, while key sectors that should grow the economy, like agriculture are left with little allocation. This is what have led to the persistence decline in the import value of some key items, such as; Chemical and Allied Products, which has fallen by 9.4%, Boiler Machinery and Appliances also by 26.0% while Basic Metal by 7.2% (NBS, 2017). Empirical data from the National Bureau of Statistics shows that the heavy National debt profiles is partly responsible for the economic retardation in Nigeria, for instance the total debt profile at nominal value stand at N 11,234,120,220,000 in the fourth quarter of 2014. In 2015, the debt profile jumped to N 12,603,705,280,000, under Buhari administration with an increase of over One Trillion Naira in the fourth quarter. The breakdown of the total debt profile shows that domestic debt profile also increased within the same period. In 2014 the domestic debt profile stands at N1, 631,523,600,000 in second quarter and by the fourth quarter, the figures jumped to N 2,111,530,710,000. In addition to the existing debt burden is the hyper-inflation in the economy. The table below shows the debt profile of Nigeria including debt service burden.

*Table 1: Nigeria debt burden*

Description	2014	2015	2016	2017
<b>Oil Revenue</b>	2,114.53	1.918 billion	1.48 Trillion	1.985 Trillion
<b>Debt profile</b>	11,243,120,220,000	12,602,705,280,000	1.8 Trillion	2.06 Trillion
<b>Debt services</b>	760,390,000,000	943 billion	1.48 Trillion	1.66 Trillion
<b>Fiscal deficit</b>	1.9%	755 billion	2.2 Trillion	2.32 Trillion
<b>Total</b>				

*Source: Author's compilation 2018*

The table above have only demonstrated that Debt and Statutory Transfers aggregate recurrent expenditure for debt profile in 2014 to 2017 stand at 409.84 Trillion while debt service stand at 4.843 Trillion within the same period. Extant explanation for this phenomenon may look straightforward thus poor countries like Nigeria depends on export of primary commodity called oil, to the industrialized countries, who then refined it into various product and sold back at a very exorbitant price. The consequence therefore, poorer countries like Nigeria will never earn enough from their export to pay for their imports, resulting in budget deficit. Further analysis of the paradox of development in the mix of increasing oil revenue, liberal scholar like Prebisch (1944) thinking revolve around the extent to which poorer countries like Nigeria actually had control over their primary products, particularly in the area of selling those products abroad in relation to imports. They noted that this vicious circle have only enhanced economic retardation in poorer counties and promote economic growth in developed countries. To further stress the proponents of dependency theory, they contended that the asymmetrical power relation between countries of the world economic system reduces the developmental potential of the peripheral countries like Nigeria through import dependence. Empirical data from the NBS, (2014) shows that Nigeria is a commodity dependent economy, with estimated import value of \$48,410,000,000 in 2014. According to the economic complexity index, Nigeria is the 52nd largest importer in the World, importing commodities like wheat, corn, rice, raw sugarcane, dairy products consume over \$22bn of foreign exchange annually. In a critical time like this, importation of commodity like sugar, salt, rice, alcohol, beverages, tobacco and cement will further retard the already inflated economy. Moreover, import bans on essential raw material for industries will also raise the price of inputs to producing industries, including those with the highest growth and employment potential. For instance building materials such as cement, steel, timber and concrete blocks, however trade ban can have an impact throughout the value chain. as these materials are protected by high tariffs, while structural timber imports are banned, resulting in increase in construction costs.

This is what scholars observed to have hampered the growth of the industry which has considerable employment potential. The study observed that despite the huge oil revenue, the Nigeria economy is still at the lowest level. A simple explanation for the economic retardation in Nigeria shows that agriculture has been relegated to the background in terms of budget allocation. For instance in 2015, the agricultural sector suffered declines due to the poor budgetary allocation, this also affected the Wholesale and Retail sector of the economy. In 2016 a further decline was also experienced, making investment in the sector unattractive, a sign of economic retardation. In the first quarter of 2017, preliminary observation suggests there was a relative decline in agricultural output which persisted till the fourth quarter of 2017. This decline in the agricultural sector in Nigeria is responsible to the huge importation of food items. In other words, huge oil revenue is diverted to food importation. This state of affair is anchored on poor allocation to Agriculture and Rural Development in the 2016 budget. It shows that recurrent capital expenditure for Agriculture and Rural Development was 29.63 billion while capital expenditure was just 46.17 making a total of 75.80 billion Naira. This budgetary allocation is meant for all Nigeria farmers, whose population is on the increase. Sample economic reasoning indicates that, the allocation to the Agricultural sector is far below expectation to grown the Nigeria ailing economy. Empirical data shows that Nigeria food importation is on the increase, especially since 2015. For example, in the third quarter of 2015, N 1,671,381 Billion worth of food was imported and by the first quarter of 2016 over 6,356,694 Billion worth of food have been imported from the Netherlands, India, China, Spain among others (NBS, 2017). Some scholars have blamed the continuous importation of food items on the over reliance on oil revenue which have enhanced the retardation of economic growth in the Agricultural sector in Nigeria. Many bourgeois scholars have attributed economic retardation in the mix of increasing oil revenue as paradoxical and should be seen as a resource curse. Their argument is anchored on the paradox of poverty in the mixed of plenty. Resource-curse or the paradox of plenty as some scholars may call it, emanates from the analysis that tend to suggest that countries with an abundance of natural resources tend to have less economic growth and worse development outcomes than the countries with fewer natural resources. The reason for this paradox of plenty or Dutch disease is somewhat attributed to government mismanagement of resources in addition to weak institutions. Other extant explanation for this state of affairs is hinged on unstable political institutions coupled with endemic corruption in the oil industry. Also identified as responsible for the economic retardation is the ease with which oil revenue is diverted to personal Bank accounts through frivolous means. Some scholars like Idama (2009), Ikelegbe, (2009) and Tonwe, (2010) have identified leadership failure as a cardinal reason for the economic retardation in Nigeria. The ineptitude of the Nigeria economic management team especially since 2016 has exacerbated the economic fortune. Empirical investigation shows that the Nigeria economy is import dependent and has enhanced its economic retardation. For instance, National Bureau of Statistic in 2017 noted that, the total exports for the period under review stood at ₦ 3,005.9 billion, while total imports stood at ₦ 2,286.5 billion. The total value of Nigeria's merchandise trade at the end of Q1, 2017 was ₦ 5,292.4 billion. This represented a slight increase of 0.1% relative to the value of ₦ 5,286.6 billion recorded in the preceding quarter. The marginal rise in exports, coupled with a slight decrease in imports brought the Country's trade balance to ₦ 719.4 billion during the period, up from ₦ 671.3 billion. This represents the second consecutive positive trade balance after 4 quarter of negative trade balance. In other words Nigeria balance of trade swing more to the negative or deficit, which pre-supposes that despite the increase in oil revenue the economy still depend on foreign goods and service for survival.

#### 4. CONCLUSION

The study has rightly argued that the Nigeria economy lacked the needed structure to grow despite the huge oil revenue. We were able to identify two main factors which influenced economic retardation in Nigeria, they classified as the internal and the external factors. The internal factors include the structure of the Nigeria economy that relied so much on oil revenue, corruption in the oil industry, ineptitude of the managers of the economy among others. These factors mentioned above were influenced by the external factors, which include the international oil market forces, the manipulation of the international capital market and the integration of the Nigeria economy into the World capitalist system. All these factors aided the economic retardation in Nigeria despite increase oil revenue. We also observed that the Nigeria economy was more import dependent than export, resulting in deficit balance of trade. The agricultural sector of the economy is on the decline since 2015. The manufacturing sector has been nose-diving since the beginning 2016 resulting to dire consequences for the economy. The implication is that oil revenue has exposed Nigeria economy to international capitalist system thereby creating laziness and ineptitude in governance. The study therefore recommended among others the de-emphasis on oil revenue by allowing oil bearing communities manage oil revenue. The Federal Government should de-emphasize monthly revenue allocation to State and Local Government.

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# DOES SUSTAINABILITY IMPACT COMPANY PERFORMANCE? THE CASE OF LISTED COMPANIES ON THE BUCHAREST STOCK EXCHANGE

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## **ABSTRACT**

*Society became more and more concerned about the consequences of their actions on future generations. As a result, it emerged concepts such as corporate social responsibility, shared value, sustainability etc. What all these concepts have in common is to create a balance with mutual benefits between the business community on one side and the environmental and social concerns. For a company to be successful, it should provide a supportive element for the environment, create opportunities for the community to develop, create a connection between societal and business progress. For companies that seek long-term performance either they are SME's or MNC's the old paradigm in which their contribution to society was reduced to paying wages, taxes, making investments and having as the main objective making profit for the shareholders. This business concept, supported by Milton Friedman changed, because nowadays the society's needs developed, are more diverse, and a company must focus its attention not only to those who provide capital (investors) but also to the stakeholders (clients, suppliers, community, etc.). The combined efforts of these stakeholders provide results (performance) for the company.*

**Keywords:** company, ESG, indicator, performance, sustainability

## **1. INTRODUCTION**

Concerns around sustainability started to matter the most when scientists research exposed the huge impact on society and our future. The catastrophic impact due to climate change, carbon emissions targeted corporations and expectations from the business landscape started to rise. It means changes in the ways that they do business, how they operate; it involves challenges but also opportunities. Based on these facts, the sustainability concept built around three major concerns: economic (profit), environmental (planet) and social (people) started to be a factor with an increasing impact on company performance. Stock markets developed sustainability indices (e.g. 'S&P Dow Jones Sustainability Index'), third-party organisations developed methodologies (e.g. 'Sustainalytics') to measure sustainability and investors pay more and more attention at the companies that have integrated into their strategy sustainability actions. As a result, the performance of a company started to be impacted both on short and especially on a long-term perspective.

## **2. SUSTAINABLE PERFORMANCE - CONCEPTUAL MODEL**

Linking the company performance to sustainability or ESG (environment, social and governance) performance started to be a topic for debate especially when it comes to the compensations that come as a result of positive results. What creates even more confusion is how sustainability or ESG is measured. On one side the 'Sustainable Development Goals' proposed by the UN which is based on 17 goals, for, e.g. "no poverty"; "zero hunger"; "good health" and "well-being" etc. These 17 goals are linked to 169 targets to measure the progress made, in each one. Large corporations have committed to the United Nations Global Compact, and they issue together with the annual report a sustainability report based on the guidelines provided by the "Global Reporting Initiative - GRI". From the top 250 world's largest companies, almost 95% report their sustainability performance, and approx. 82% are using GRI

standards. On the other side, third-party organisations - MSCI; Sustainalytics; Bloomberg; Thomson Reuters; RepRisk; RobecoSam (Dow Jones Sustainability Index); Corporate Knights and Institutional Shareholder Services, have developed their methodologies based on similar grounds or pillars. And by using various sets of indicators to measure sustainability. Furthermore, some companies have developed their proprietary metrics to measure their sustainability progress. Besides the companies mentioned, B Lab, a U.S. non-profit organisation, offers what they call "B Certification" for start-ups, large corporations. According to the organisation, this certification "is the only certification that measures a company's entire social and environmental performance". Moreover, for a company, small or large, have to accomplish not only requirements related sustainability performance but also certain standards in terms of transparency, accountability, having as the main objective a positive impact for all the stakeholders involved (shareholders, employees, customers, suppliers, local community etc.). Large corporations can obtain a "B Certification" either for the parent company or its subsidiaries, such examples with certified subsidiaries are Unilever with Ben & Jerry's and Seventh Generation subsidiaries; Danone with Happy Family subsidiary, Danone has 30% of its brands under certification, Procter & Gamble with New Chapter subsidiary, or certified corporations such as Bancolombia, Northwest Permanente, Laureate Education and Intrepid Travel (B Lab, 2019). The CEO of Unilever, Paul Polman is a business leader and a huge supporter and promoter of implementing sustainability and helped this topic to become mainstream. During his time at Unilever (almost a decade) he understood the long-term impact of including environmental, social and governance concerns into the business but also the financial impact, as a matter of fact, the stock of Unilever, during his term outperformed its peers and also the FTSE 100 index (see figure 1). The companies mentioned above have committed to a sustainable path, but examples continue with well-known brands such as PepsiCo, Nestle, IKEA, McDonald's and also the city of Seattle who banned the plastic straws starting with 1<sup>st</sup> of July 2018 (Winston, 2018). Even though the trend is towards implementing sustainability in the strategy of the company, Burchman (2018) claims that this path is not for every business, although surveys by McKinsey (2015), UN and Accenture (2016) reveal that executives see sustainability as a determinant in business growth, new business opportunities and the main cause of major changes in the business environment. Recent reports from both academic (Harvard Business School) and private researchers (Ceres, Morgan Stanley, Bank of America), it lowers the cost of capital and market volatility, suggests Lubber (2019). One issue that Lubber underlines is the lack of recognition from companies that sustainability is a real value driver for their business and has a strong impact on financial performance. This failure in presenting the facts to investors translates into costs produced by missing opportunities or competitive advantages. Based on the arguments above and the fact that investments oriented to ESG grew in the past years, and the large companies, public traded companies are engaged in the reduction of CO<sub>2</sub> emissions, water waste, etc. plus the financial performance brought by implementing sustainability into the business core strategy we can say that ESG or sustainability concerns became the business mainstream.

*Figure following on the next page*



Figure 1: Unilever share price, for the period 2009 - 2018 (London Stock Exchange)

A major step was the launch in 2009 of the SSE - Sustainable Stock Exchanges initiatives which involve "a voluntary public commitment" by the capital market around the world for them to be "aligned with public policy goals on sustainable development". The SSE initiative contains a database consisting of 95 stock exchanges around the globe, with over 50.000 listed companies. The Bucharest Stock Exchange - BSE is a member of the SSE initiative, with 87 listed companies and a market value of almost 24 mil. \$. In terms of the criteria followed by SSE, the BSE it meets only one - membership, for the others (sustainability reporting, ESG reporting as a listing rule, guide related to ESG reporting, ESG related training, sustainability metrics and sustainability bond segment) is a commitment and work in progress. One important criterion listed is that related to the metrics, and based on the information provided by SSE, only 37% of the stock markets have sustainability-related metrics or indicators, even though according to Scott (2019) one out of four dollars invested in the U.S is in ESG initiatives, and reached almost 23\$ trillion overall. Having in mind the fact that sustainability became a performance driver, together with the financial performance could be combined to deliver sustainable performance, see figure 2. To operationalise the conceptual model (sustainable performance), for the financial performance, I have selected financial ratios such as Return on Assets - ROA, Return on Equity - ROE, Return on Capital Employed and Enterprise Multiple which can be very useful in measuring and evaluating the financial performance of a company. To do that, I have extracted raw data from the financial statements of 59 companies listed on the Bucharest Stock Exchange - BSE for the year 2017. As a sustainable indicator, I have selected the Dow Jones Sustainable Index, published by RobecoSam in their annual yearbook (2018). Over 3.400 companies participated in RobecoSam's Corporate Sustainability Assessment, both from developed and emerging countries. Based on the fact that BSE has engaged in the UN initiatives for sustainability, and what would be the impact on the performance of sustainable metrics for Romanian public traded companies I have formulated the following hypotheses:

- Hypothesis 1: There are direct and positive interrelations between the following items: revenues, net income, total assets, total debt, shareholder's equity and capital employed, but the degree of correlation between them is different, both at the overall level and at the sector level.

- Hypothesis 2: When considering the sector of activity, there are gaps between the following variables: revenues, net income, return on assets, return on equity, enterprise multiple from one group of companies (based on my own clusterization on sectors and using the MSCIs Global Industry Classification Standard) to another; more, there will be differences among the sustainable performance function scores for the 59 companies if consider them both as overall and by sectors/groups.

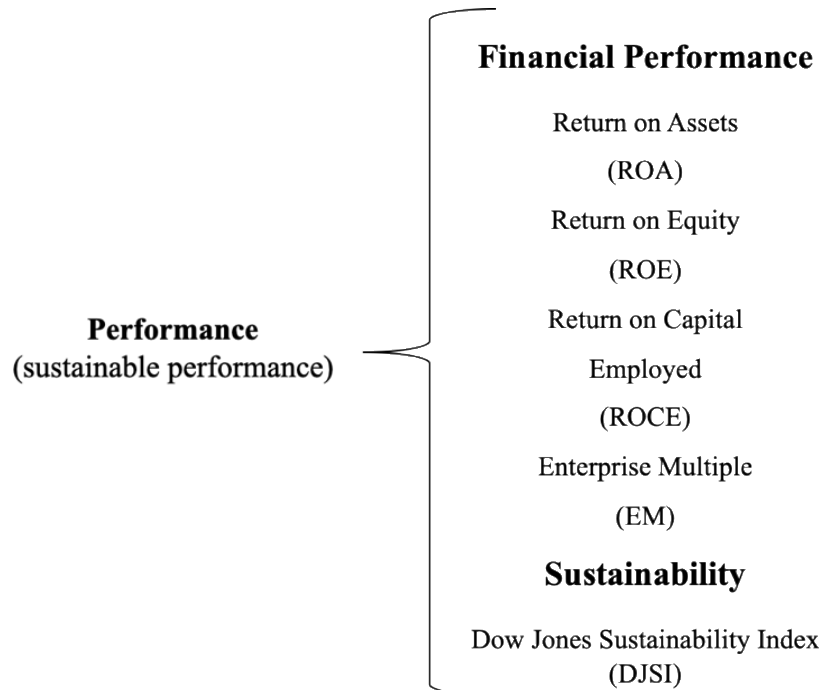


Figure 2: Conceptual model

### 3. METHODOLOGY

This paper is about proposing an overall function or functions based on sectors/groups classifications to measure sustainable performance. To develop the conceptual model, I have collected data from the Bucharest Stock Exchange, for 59 out of 87 listed companies. The companies selected have obtained a net profit in the analysed year (2017), and I considered relevant information for my study: revenues, net income, total assets, total debt, shareholder's equity and capital employed and the Dow Jones Sustainable Index. Table 1 shows data collected from the Financial Statements of the 59 Romanian companies listed on the BSE.

Table 1: Descriptive statistics and items

		Total	Mean	Standard Deviation
1	Revenues (mil. EUR)	5.543,77	93,9622	347,08434
2	Net Income (mil. EUR)	742,20	12,5797	40,72137
3	Total Assets (mil. EUR)	11.724,53	198,7208	475,11911
4	Total Debt (mil. EUR)	3.117,65	52,8415	172,21355
5	Shareholder's Equity (mil. EUR)	8.606,70	145,8763	387,80660
6	Capital Employed (mil. EUR)	11.724,53	198,7208	475,11911

Number of observations 59 for each item, df-58.

The companies from the Bucharest Stock Exchange refers to companies from various sectors and industries. As a result, I have grouped the companies into four categories shown in table 2, with the sectors included in each group, based on similarities and using the MSCIs Global Industry Classification Standard.

*Table 2: Groups of companies, sector based*

A	Communication Services (1); Consumer Discretionary (6); Consumer Staples (2) – 9 companies
B	Energy (5); Health Care (6); Utilities (5) – 16 companies
C	Industrials (14); Materials (10) – 24 companies
D	Financials (10) – 10 companies

*Table 3: Averages on groups*

Group	Revenues*	Net Income*	Total Assets*	Total Debt*	Shareholder's Equity*	Capital Employed*
A	31,23	1,98	40,40	11,70	25,84	36,36
B	260,75	17,97	367,61	141,26	213,04	345,99
C	32,03	2,51	48,28	21,24	27,04	48,28
D	32,19	37,68	432,03	24,27	407,76	432,03

*\*million EUR*

Based on the results from table 3, there are significant differences between variables from one group to another. A huge gap between group B in term of revenues (260,75 mil. euros) and the other three groups (A, C and D). In table 4, are shown the Pearson correlation results of the variables selected for each group.

*Table 4: Pearson correlations for every group*

Group A		1	2	3	4	5	6
1	Revenues (mil. EUR)	1					
2	Net Income (mil. EUR)	,840**	1				
3	Total Assets (mil. EUR)	,903**	,818**	1			
4	Total Debt (mil. EUR)	,904**	,937**	,845**	1		
5	Shareholder's Equity (mil. EUR)	,798**	,663	,963**	,669*	1	
6	Capital Employed (mil. EUR)	,903**	,818**	1,000**	,845**	,963**	1
Group B		1	2	3	4	5	6
1	Revenues (mil. EUR)	1					
2	Net Income (mil. EUR)	,185	1				
3	Total Assets (mil. EUR)	,731**	,631**	1			
4	Total Debt (mil. EUR)	,984**	,317	,836**	1		
5	Shareholder's Equity (mil. EUR)	,401	,732**	,917**	,548*	1	
6	Capital Employed (mil. EUR)	,731**	,631**	1,000**	,836**	,917**	1
Group C		1	2	3	4	5	6
1	Revenues (mil. EUR)	1					
2	Net Income (mil. EUR)	,621**	1				
3	Total Assets (mil. EUR)	,912**	,753**	1			
4	Total Debt (mil. EUR)	,956**	,678**	,965**	1		
5	Shareholder's Equity (mil. EUR)	,791**	,777**	,959**	,852**	1	
6	Capital Employed (mil. EUR)	,912**	,753**	1,000**	,965**	,959**	1
Group D		1	2	3	4	5	6
1	Revenues (mil. EUR)	1					
2	Net Income (mil. EUR)	,971**	1				
3	Total Assets (mil. EUR)	,965**	,982**	1			
4	Total Debt (mil. EUR)	-,183	-,268	-,141	1		
5	Shareholder's Equity (mil. EUR)	,966**	,985**	1,000**	-,165	1	
6	Capital Employed (mil. EUR)	,965**	,982**	1,000**	-,141	1,000**	1

*\*\**. Correlation is significant at the 0.01 level (2-tailed).

*\**. Correlation is significant at the 0.05 level (2-tailed).

*n = 59, sig 2 tailed*

As expected, the variables considered (revenues, net income, total assets, total debt, shareholder's equity and capital employed) are strong and very strong correlated in almost every

group. Net income and total assets have a Pearson correlation value of 0,818 in Group A; 0,631 in Group B; 0,713 in Group C and 0,982 in Group D.

### 3.1. The sustainable performance function

The variables selected were used in a multiple discriminant analysis, resulting a function:

$$Z = a_{1i}X_1 + a_{2i}X_2 + a_{3i}X_3 + a_{4i}X_4 + a_{5i}X_5 + \Sigma b_i$$

$$Z \text{ function or sustainable performance function} = a_{1i}ROA + a_{2i}ROE + a_{3i}ROCE + a_{4i}EM + a_{5i}DJSI + \Sigma b_i$$

Where:

$a_i$  and  $b_i$  - represents discriminants coefficients;

$i$  - represents the Group: A, B, C and D.

ROA, ROE, ROCE, EM, DJSI - independent variables

### 3.2. Results and discussions

To test the hypotheses, I have used the Pearson correlation between items selected. The results presented in table 4 show that there are strong and very strong, directly correlations for the sample selected. Therefore the Hypothesis 1 is valid. I applied as I mentioned before, a discriminant analysis to calculate  $a_i$  and  $b_i$ .

Table 5: The overall performance function

	ROA	ROE	ROCE	EM	DJSI	Overall Sustainable Performance function
Min	0,13	0,3	-0,07	-2,48	0	$SPf = 3,53ROA + 0,95ROE + 3ROCE + 1,74EM + 1,05DJSI + 3,79$
Max	28,48	105,29	33,24	55,05	95	
a	3,53	0,95	3	1,74	1,05	
b	-0,45	-0,29	0,22	4,31	0	
The results of ROA, ROE, ROCE, EM discriminant coefficients were multiplied by 100 to be comparable and to have the same weight and to offer a larger interval of variation.						

In table 5, I computed the variable for 59 companies to identify the overall sustainable performance function without considering the sector/group. The sustainable performance function (SPf) cannot be applied as a single function without considering the sector/group.

Table 6: Performance function based on the sector of activity

		ROA	ROE	ROCE	EM	DJSI	Sustainable Performance function (SPf)
A	Min	0,19	0,38	0,83	0,01	0	$Sp_A = 8,09ROA + 2,32ROE + 6,75ROCE + 8,58EM + 1,11DJSI - 8,15$
	Max	12,55	43,52	15,64	11,66	90	
	a	8,09	2,32	6,75	8,58	1,11	
	b	-1,54	-0,88	-5,62	-0,11	0	
B	Min	0,47	0,78	-0,07	0	0	$Sp_B = 3,98ROA + 2,96ROE + 3,4ROCE + 6,26EM + 1,09DJSI - 3,95$
	Max	25,61	34,59	29,32	15,98	92	
	a	3,98	2,96	3,4	6,26	1,09	
	b	-1,87	-2,31	0,25	-0,02	0	
C	Min	0,13	0,3	0,67	-2,48	0	$Sp_C = 6,76ROA + 3,24ROE + 5,65ROCE + 1,74EM + 1,09DJSI - 1,32$
	Max	14,92	31,19	18,38	55,05	92	
	a	6,76	3,24	5,65	1,74	1,09	
	b	-0,86	-0,98	-3,79	4,31	0	
D	Min	0,76	3,04	0,45	0	0	$Sp_D = 3,61ROA + 0,98ROE + 3,05ROCE + 6,35EM + 1,05DJSI - 7,09$
	Max	28,48	105,29	33,24	15,75	95	
	a	3,61	0,98	3,05	6,35	1,05	
	b	-2,73	-2,97	-1,38	-0,02	0	
The results of ROA, ROE, ROCE, EM discriminant coefficients were multiplied by 100 to be comparable and to have the same weight and to offer a larger interval of variation.							

As shown in table 6, some variables could have a higher impact than others if we take into consideration the sector/group. Also in table 6, we can see different levels of minimum and maximum and different discriminant coefficients. For example, the value of ROA is higher in Groups A (8,09) and C (6,76), almost double than in Groups B (3,98) and D (3,61). The EM has the lowest value (1,74) in Group C, and the higher value (8,58) in Group A. The DJSI is not a volatile value, because it's minimum is 0, and the maximum value is over 90. Based on the values of discriminant coefficients and the functions from tables 5 and 6 we can calculate the sustainable performance score and compare them. The score will be able to help us rank the companies at the industry, sector, national or even global level.

*Table 7: Performance score for selected companies*

Group	Company	ROA	ROE	ROCE	EM	DJSI	Z without Group/industry	Z considering Group/industry
A	ALTUR S.A.	1,98	40,40	11,70	25,84	36,36	141,18	201,82
A	CASA DE BUCOVINA-CLUB DE MUNTE	17,97	367,61	141,26	213,04	345,99	108,09	162,10
A	BERMAS S.A.	2,51	48,28	21,24	27,04	48,28	173,48	297,34
A	COMPA S. A.	37,68	432,03	24,27	407,76	432,03	165,50	312,58
A	TURISM, HOTELURI, RESTAURANTE MAREA NEAGRA S.A.	1,98	40,40	11,70	25,84	36,36	94,86	115,95
B	ANTIBIOTICE S.A.	17,97	367,61	141,26	213,04	345,99	157,93	208,48
B	BIOFARM S.A.	2,51	48,28	21,24	27,04	48,28	231,11	327,63
B	CONPET SA	37,68	432,03	24,27	407,76	432,03	183,07	279,11
B	SOCIETATEA ENERGETICA ELECTRICA S.A.	1,98	40,40	11,70	25,84	36,36	117,94	122,01
B	Med Life S.A.	17,97	367,61	141,26	213,04	345,99	106,24	121,49
B	OIL TERMINAL S.A.	2,51	48,28	21,24	27,04	48,28	109,62	134,78
B	ROMPETROL WELL SERVICES S.A.	37,68	432,03	24,27	407,76	432,03	112,84	124,87
B	ROPHARMA SA	1,98	40,40	11,70	25,84	36,36	136,52	168,93
B	ROMPETROL RAFINARE S.A.	17,97	367,61	141,26	213,04	345,99	140,81	212,54
C	S.C AAGES S.A.	2,51	48,28	21,24	27,04	48,28	183,50	263,70
C	ALRO S.A.	37,68	432,03	24,27	407,76	432,03	231,39	395,23
C	ALUMIL ROM INDUSTRY S.A.	1,98	40,40	11,70	25,84	36,36	304,69	440,10
C	AEROSTAR S.A.	17,97	367,61	141,26	213,04	345,99	197,06	319,98
C	TMK - ARTROM S.A.	2,51	48,28	21,24	27,04	48,28	159,74	223,76
C	ARTEGO SA	37,68	432,03	24,27	407,76	432,03	157,95	208,62
C	CARBOCHIM S.A.	1,98	40,40	11,70	25,84	36,36	91,48	100,77
C	CEMACON SA	17,97	367,61	141,26	213,04	345,99	163,71	228,91
C	COMELF S.A.	2,51	48,28	21,24	27,04	48,28	169,91	234,30
C	TRANSILVANIA CONSTRUCTII SA	37,68	432,03	24,27	407,76	432,03	105,07	111,42
C	ELECTROARGES SA CURTEA DE ARGES	1,98	40,40	11,70	25,84	36,36	199,83	294,46
C	IAR SA Brasov	17,97	367,61	141,26	213,04	345,99	180,22	268,47
C	IMPACT DEVELOPER & CONTRACTOR S.A.	2,51	48,28	21,24	27,04	48,28	195,03	277,16
C	MECANICA FINA SA	37,68	432,03	24,27	407,76	432,03	106,03	116,59
C	SOCIETATEA DE CONSTRUCTII NAPOCA SA	1,98	40,40	11,70	25,84	36,36	108,39	118,89
D	BRD - GROUPE SOCIETE GENERALE S.A.	17,97	367,61	141,26	213,04	345,99	138,07	128,19
D	Erste Group Bank AG	2,51	48,28	21,24	27,04	48,28	116,23	105,72
D	FONDUL PROPRIETATEA	37,68	432,03	24,27	407,76	432,03	215,03	278,70
D	SIF BANAT CRISANA S.A.	1,98	40,40	11,70	25,84	36,36	125,79	140,40
D	SIF TRANSILVANIA S.A.	17,97	367,61	141,26	213,04	345,99	149,69	193,15
D	SIF MUNTENIA S.A.	2,51	48,28	21,24	27,04	48,28	149,53	184,04
D	TRANSILVANIA BROKER DE ASIGURARE	2,51	48,28	21,24	27,04	48,28	417,87	470,77

In Table 7 I computed the SPS for the whole sample, 59 companies using both functions, the general one (without considering the sector/group) and the specific one, based on the sector/group. The findings show that SPf with and without considering the sector/group are very for Groups A and C and not very different for Groups B and D. According to the results from Table 7 and based on the overall and sector/group functions developed and presented in Tables 5 and 6, the hypothesis 2 is confirmed, because there are gaps between ROA, ROE, ROCE and EM at the group level, which means different sustainable performance functions with different discriminant coefficients and scores.

### 3.3. Limitations and future research

The results and findings of the article, even though they are significant, have their limitations. On the one hand I have been limited to the metrics related to sustainability, considering the access to data, the Dow Jones Sustainability Index provides data only for the leaders of the industry/sectors of activities. Then the fact that I had a low number of companies in the sample, by selecting only the companies with a net profit from the Bucharest Stock Exchange. Also by classifying the companies into four groups is also a limitation. It is a starting point for future research which will require a larger set of data, a longer period and developing a sustainable performance metric under financial metrics.

## 4. CONCLUSION

In the study, I have approached the financial performance with appropriate metrics, and together with a sustainable metric (DJSI), I have integrated them into a model for measuring the sustainable performance. The findings confirmed the hypothesis that there are interrelations (direct and positive) between items such as revenues, net income, total assets, total debt, shareholder's equity and capital employed. Also, the functions developed generated different discriminant coefficients showing that the independent variables (ROA, ROE, ROCE and EM) have a different contribution in each group. When the sustainable performance functions were applied for the 59 companies from the sample, I concluded that the two SPf scores are different. Companies that have been ranked on the top based on the revenues have also been ranked in higher positions in terms of sustainable performance. It is very important to take into consideration either the industry or sector of activity when such an analysis is conducted (sustainable performance) because the specificities of a particular sector or industry is the key factor that could make the difference between how a company is performing in a certain industry/sector. Otherwise the results are not comparable.

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## THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES ON COUNTRIES ECONOMIC GROWTH

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### ABSTRACT

*It is consensual that information and communication technologies are a powerful tool. ICTs contribute to changes in society, as they are present in the creation and dissemination of knowledge in innovative societies. The new knowledge economy takes on the dimension of ICTs not as drivers of change, but as tools that help to unleash the creative potential and knowledge of people. This dimension is therefore essential for enhancing the synergies created between the country's innovation system, human capital and society itself. Consequently, the creation of wealth in a country is increasingly linked to the ability to add value using products, services and ICT. The present study focuses on a wide range of countries, where is analysed the evolution of two aspects of ICT: the use of ICT at the enterprise level and the use of ICT by society in general. Considering that access to information is privileged with the use of the internet. The data was collected from the database PORDATA – Base de dados de Portugal contemporâneo – organized and developed by the Francisco Manuel dos Santos Foundation. The data are related to the period from 2003 to 2017 and the evolution of each of the ICT aspects is presented using descriptive statistics. It is also presented the comparison between the different countries. In order to assess the impact of each of these ICT aspects on the economic level of each country, linear regression models that establish the relationship between the two ICT variables and their impact on GDP per capita are estimated and analysed.*

**Keywords:** *Economic growth, Information and Communication Technologies, Linear regression models*

### 1. INTRODUCTION

There are many ways that people and companies can access, share, and process information. There is a wide range of means, called Information and Communication Technologies (ICT), that allow for better effectiveness and efficiency in the use of information and knowledge. While ICTs have progressed considerably, mainly over the last decades and their role in the knowledge economy is fundamental, it is important to analyse their suitability and success for the achievement of results.

In this way, the present study aims to analyse and compare a set of 29 countries regarding to the success of ICT use by companies and individuals. In this study we first present a brief review of the literature on information and communication technologies and their position in the knowledge economy. Afterwards, are presented the multiple linear regression models estimated, where the independent variables considered were: use of ICT by companies (Companies with 10 and more persons employed with internet connection, as percentage of total companies) and use of ICT by individuals (Individuals who used computers in the last 3 months, as percentage of total individuals). The dependent variable under study is related to economic growth and for that was used the GDP per capita. The analysis of the regression models was complemented with the analysis of the trend and evolution of each of the independent variables, comparing each one of the countries, giving special emphasis to those with better and worse results. To finish, the main conclusions to be drawn from the results of the empirical study are summarized in the conclusion.

## **2. INFORMATION AND COMMUNICATION TECHNOLOGIES**

The impact of Information and Communication Technologies on the economic and social development of countries has been the subject of numerous studies over the last decades. In most studies, it can be concluded that the increase and advancement of ICT leads to an increase in Gross Domestic Product (GDP) and productivity, as well as an increase in the creation of employment, contributing positively to the development of countries. "(...) some empirical studies have focused on investigating the impact of ICT on economic growth, concluding that the ICT sector is a major contributor to economic growth. Other studies have assessed the impact of the ICT sector on economic growth by controlling other determinants of growth and have indicated that the development of the ICT sector is one of the key drivers of the economic growth. Another category of studies aimed to analyze the extent to which there is a causal relationship between ICTs and economic growth. Regarding the latter, most researchers have concluded that ICT is both a cause and a consequence of economic growth" (Toader, E., Firtercu, B.N., Roman, A. & Anton, S., 2018, p.2). In considering the relationship between ICTs and countries' economies, it is essential to analyse the concept of the knowledge economy defined by the OECD (2015) as an economy where knowledge is the cornerstone of growth and development of countries, which their efforts for production and for services based on intensive knowledge activity. ICTs are of the utmost importance, since they empower the access, use and dissemination of knowledge and information. In the same sense, according to the World Bank (2018) ICT is inserted in the context of the knowledge economy insofar as they are one of the four fundamental dimensions to development and growth, as shown in figure 1.

*Figure following on the next page*

The four pillars of the knowledge economy			
Pillar 1	Pillar 2	Pillar 3	Pillar 4
Economic and institutional regime	Education and skills	Information and communication infrastructure	Innovation system
A regulatory and economic environment that enables the free flow of knowledge, supports investment in ICT and encourages entrepreneurship is central to the knowledge economy.	An educated and skilled population is needed to create, share and use knowledge.	A dynamic information infrastructure-ranging from radio to the internet is required to facilitate the effective communication, dissemination and processing of information.	A network of research centers, universities, think tanks, private enterprises and community groups is necessary to tap into the growing stock of global knowledge, assimilate and adapt it to local needs, and create new knowledge.

Figure 1: The four pillars of the knowledge economy (World Bank. 2018, Retrieved 18/03/2019 from [http://web.worldbank.org/archive/website01503/WEB/0\\_CO-10.HTM](http://web.worldbank.org/archive/website01503/WEB/0_CO-10.HTM))

As reported by Ernst & Young (2006), ICTs release people's creative potential and knowledge and in this way ICT can be seen as facilitating and promoting tools, since "the new economics looks at ICT not the drivers of change but the tools for releasing the creative potential and knowledge embodied in people" (Ernst & Young, 2006, p.3). Gorji & Alipouria (2011) also argue that the use of ICT can facilitate greater efficiency in the communication, dissemination and processing of information and communication. ICTs allow information to be transmitted relatively efficiently and at reduced costs, with "ICT usage tends to reduce uncertainty and transaction costs of participating in economic transactions. This tends to lead to an increase in the volume of transactions leading to a higher level of output and productivity" (Gorji & Alipouria, 2011, 53). According to Gorji & Alipouria (2011) the benefits of ICT can be synthesized in two sets:

- "The tangible benefits include: Reduced cost, Improved productivity (i.e., amount of output produced per unit of input), Increased market share, Savings in labor, Increased consumer surplus (i.e., the accumulated difference between consumer demand and market price), Improved customer service quality, Improved organizational efficiency, Quicker response to customers, Deeper knowledge and understanding of customers.
- The intangible benefits include: Improved decision-making ability, Superior product quality, Knowledge/information management and sharing, Improved coordination/relationships with partners, Other forms of competitive advantages." (Gorji & Alipouria, 2011, p. 54)

It should also be point that, as noted by Ernst & Young (2006) and Rocio (2010), the rate of growth in terms of technological change has increased considerably in the last 30 years, over the course of the twentieth century, computers, telephones (fixed and mobile) and computer networks. These different forms of information processing and dissemination technologies do not present restrictions on the type of information or the kind of processing they perform. In this way, the contribution of ICT to the economic growth of countries is a crucial aspect to consider.

### 3. METHODOLOGY

The period in study is from 2003 to 2017, since is the period when the data is available jointly for the three considered variables. The data was collected from the database PORDATA – Base de dados de Portugal contemporâneo – organized and developed by the Francisco Manuel dos Santos Foundation and since there are some missing data. The data was imputed by the average of the adjacent values, when there were observations (in the adjacent years), if for the first(s) year(s) there weren't registered values the data wasn't imputed (the number of years for each country is registered in the table). The linear regression model was used to explain the GDP per capita of each country in function of C (Use of ICT by society) and I (Use of ICT by companies). The coefficients were estimated by ordinary least squares method considering robust standard errors, when we were in presence of residual autocorrelation the Hildreth-Lu estimator was applied, in order to correct it, as described in Kobayashi (1985). The linear regression models are presented for each country, establishing the relation between the independent variables:

- Use of ICT by society: Individuals who used computers in the last 3 months, as % of total individuals
- Use of ICT by companies: Companies with 10 and more persons employed with internet connection, as % of total companies

In order to assess the impact of each of these ICT aspects on the economic level of each country, are estimated linear regression models that establish the relationship between the two ICT variables and their impact on GDP per capita. The model:

$$GDP_i = \beta_{i0} + \beta_{i1}C_{it} + \beta_{i2}I_{it} + u_{it}$$

$$i = 1, \dots, 29$$

$$t = 2003, \dots, 2017$$

$$i - \text{represents each country}$$

As shown in Table 1, there is a set of countries that should be highlighted because it has a very favourable relationship between the use of ICT and economic growth: Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Malta, Netherlands, Poland, Romania and Slovakia. Of the 29 countries, these 11 stand out given their positive impact of the ICT variables at the corporate level and at the social level, in GDP per capita. This suggests that there is a strong adjustment in the use of ICTs, contributing to the economic growth of countries. On the other hand, there are 4 countries (Ireland, Italy, Luxembourg and Portugal) where the use of ICT appears to be inadequate to achieve good economic results, since the coefficients obtained in the models presented have negative signs both in the level of ICT use by companies and in the level of ICT use by individuals in the society.

*Table following on the next page*

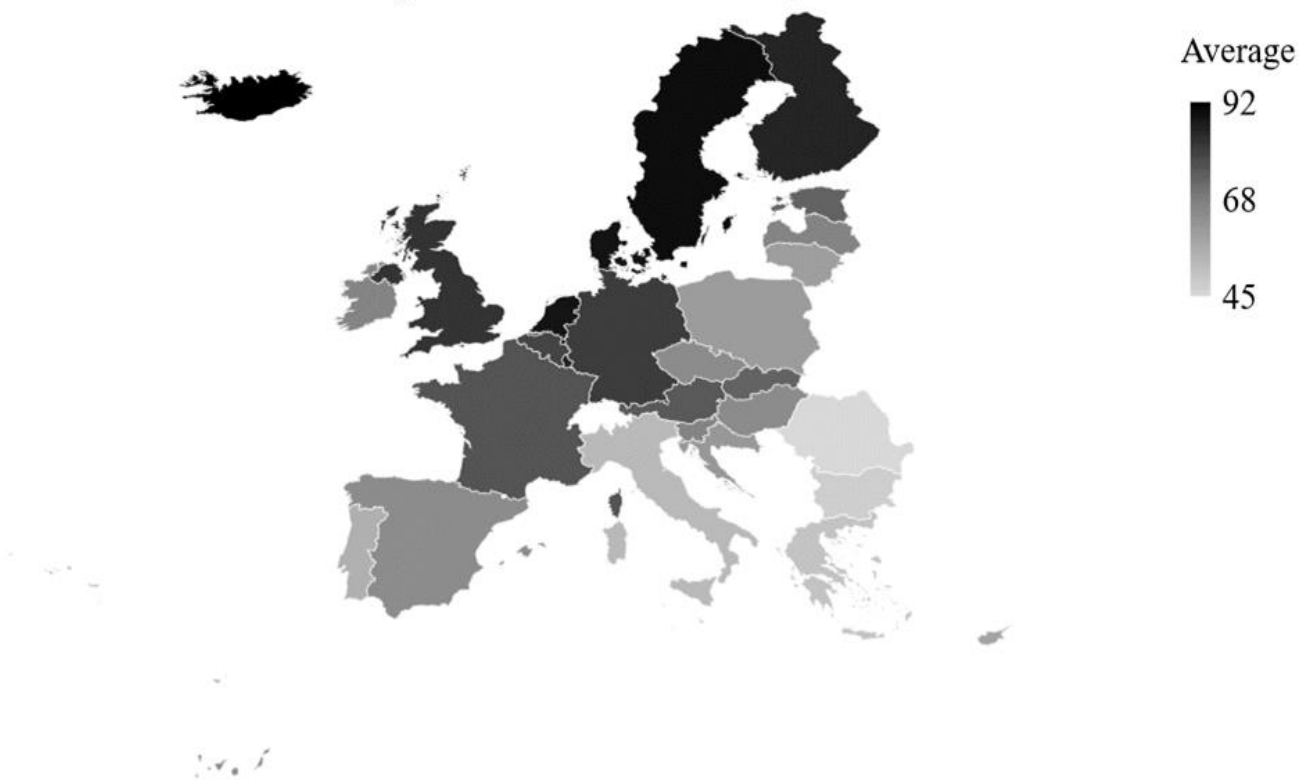
*Table 1: GDP per capita explained using ICT by society and companies in 29 countries (the authors)*

Country	constant	C	I	$R^2$	$\bar{R}^2$	$t$
AT	145,683*** (37,009)	-0,212 (0,184)	0,007 (0,303)	0,6066	0,5351	15
BE	213,507*** (15,466)	0,179*** (0,051)	-1,127*** (0,190)	0,5956	0,5058	12
BG	11,806*** (2,196)	0,049** (0,021)	0,355*** (0,037)	0,9598	0,9525	14
CY	90,8789** (36,027)	-0,132 (0,137)	0,092 (0,405)	0,8825	0,8611	14
CZ	23,012 (19,567)	0,085* (0,048)	0,574** (0,239)	0,8206	0,7907	15
DE	55,140 (46,136)	1,048** (0,349)	(-0,247) 0,481	0,8711	0,8477	14
DK	227,330*** (36,660)	0,526*** (0,089)	-1,510*** (0,442)	0,7846	0,7487	15
EE	-31,186 (38,442)	0,406*** (0,101)	(0,743) (0,470)	0,8269	0,7956	14
ES	84,2396*** (22,804)	-0,523** (0,196)	0,479 (0,368)	0,6999	0,6499	15
FI	-97,9282 (75,286)	-0,690*** (0,152)	2,733*** (0,859)	0,3833	0,2806	15
FR	97,343** (29,265)	-0,046 (0,078)	0,058 (0,257)	0,6874	0,6093	11
GR	20,187 (48,412)	-0,562*** (0,083)	(1,002)* (0,527)	0,8256	0,7965	15
HR	55,099*** (7,366)	-0,052 (0,033)	0,090 (0,073)	0,3043	0,1304	11
HU	44,968*** (10,001)	0,139* (0,073)	0,123 (0,164)	0,6955	0,6401	14
IE	363,003 (217,196)	-0,432 (0,656)	-0,498 (1,712)	0,6399	0,5745	14
IS	-102,542 (117,919)	-1,44745*** (0,281)	3,643** (1,313)	0,6935	0,6425	15
IT	203,274*** (19,556)	-0,165* (0,081)	-0,963808*** (0,246)	0,8573	0,8335	15
LT	-16,003 (21,3277)	0,369** (0,137)	0,613* (0,315)	0,8565	0,8303	14
LU	328,116* (168,795)	-0,340 (0,474)	-0,370 (1,844)	0,5431	0,4601	14
LV	7,80386 (15,4950)	0,156 (0,167)	0,441 (0,302)	0,8208	0,7882	14
MT	10166,1 (6998,66)	0,038 (0,109)	0,111 (0,319)	0,9065	0,8857	12
NL	-11695,7** (5159,12)	0,453** (0,193)	0,230 (0,216)	0,8551	0,8288	14
PL	-26,6866 (36,5087)	0,431** (0,163)	0,671 (0,496)	0,8176	0,7844	14
PT	89,8891*** (5,58614)	-0,142* (0,071)	-0,030 (0,098)	0,6157	0,5517	15
RO	4,828 (4,425)	0,092** (0,033)	0,554*** (0,072)	0,9034	0,8859	14
SE	181,439*** (31,478)	0,136 (0,102)	-0,712* (0,388)	0,2570	0,1331	15
SI	27,8709 (50,588)	-0,277** (0,104)	0,774 (0,589)	0,5526	0,4712	14
SK	3,922 (3,031)	0,597*** (0,103)	0,247** (0,081)	0,9183	0,9034	14
UK	153,440*** (22,618)	-0,521*** (0,152)	0,0001 (0,138)	0,9293	0,9165	14

AT – Austria, BE – Belgium, BG – Bulgaria, CY – Cyprus, CZ – Czech Republic, DE – Germany, DK – Denmark, EE – Estonia, ES – Spain, FI – Finland, FR – France, GR – Greece, HR – Croatia, HU – Hungary, IE – Ireland, IS – Iceland, IT – Italy, LT – Lithuania, LU – Luxembourg, LV – Latvia, MT – Malta, NL – Netherlands, PL – Poland, PT – Portugal, RO – Romania, SE – Sweden, SI – Slovenia, SK – Slovakia, UK – United Kingdom  
 Standard errors in parenthesis; \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

As regards the remaining 14 countries, it is found that in general (in 10 countries: Austria, Cyprus, Spain, Finland, France, Greece, Croatia, Iceland, Slovenia and United Kingdom) the use of ICT in companies is more adequate than the use of ICT at the individual level, since only this variable (ICT in companies) has an positive impact on GDP *per capita*. These results suggest that the use of ICT by individuals is not the most adequate to achieve economic results for the country but may be favourable to the speed and effectiveness of access and sharing knowledge and information. In order to better understand and complement the results presented in the multiple linear regression models, are presented below the analyses related to the central tendency of the independent variables used. The analysis of their growth is also carried out over the period under study, in order to understand the evolution and the effort of each country in the use of ICT. In Figure 2, referring to the individuals who used computers in the last 3 months as a percentage of total individuals, it is possible to verify that the countries that stand out, being above average, are located mainly in central and northern Europe.

### Individuals who used computers in the last 3 months, as % of total individuals



*Figure 2: Individuals who used computers in the last 3 months, as percentage of total individuals: average for the period 2003 to 2017 (the authors)*

Belgium, Germany, Denmark, Estonia, Netherlands, Sweden and Slovakia stand out, because are above the average of 70% of ICT use by individuals. Given that this ICT variable was also favourable to economic growth through the regression models previously presented. In relation to the average value of companies with 10 and more persons employed with internet connection as percentage of total companies, it is observed in Figure 3 a better consistency, in which most countries present values close to the average of 93%. In this case, the countries in south-eastern Europe are below average. However, it should be noted that Bulgaria, Cyprus, Hungary, Latvia, Poland and Romania, although below average, have an excellent ICT adequacy at the enterprise level, given that in the regression models presented their impact on economic growth is positive.

**Companies with 10 and more persons employed with internet connection, as % of total companies**



*Figure 3: Companies with 10 and more persons employed with internet connection, as percentage of total companies: average for the period 2003 to 2017 (the authors)*

Following the analysis of countries above and below average in terms of ICT use, it is now important to analyse their evolution over the study period. Regarding the use of ICT by the individuals, there is an average increase of 4.27%. As shown in figure 4, the countries of south-eastern Europe are the countries with the highest growth rate in recent years, with Romania leading with an average growth of 12.81%.

**Individuals who used computers in the last 3 months, as % of total individuals**



*Figure 4: Individuals who used computers in the last 3 months, as percentage of total individuals: average of the annual growth for the period 2003 to 2017 (the authors)*



When looking at figure 5, the growth rate in the use of ICT by companies is like the previous one. This more pronounced growth in the countries of south-east Europe, together with the positive impact of this variable on the economic growth of these countries, suggests an adequate catching up process. The increase in the use of ICT by individuals and by companies has been less prevalent in the countries of central and northern Europe and is justified by the fact that these countries have high average levels of ICT use.

**Companies with 10 and more persons employed with internet connection, as % of total companies**



*Figure 5: Companies with 10 and more persons employed with internet connection, as percentage of total companies: average of the annual growth for the period 2003 to 2017 (the authors)*

#### 4. CONCLUSIONS

It is consensual that in the era of the knowledge economy the way in which information and knowledge can be transmitted is fundamental to the countries' growth and development. It is extremely important to analyse if information and communication technologies are leading to the expected results. ICT refers to the most diverse forms of collecting, processing and sharing data. Its evolution over the past few decades has been quite rapid and currently the use of computers and internet access are some of the fastest ways to access and share information. The purpose of this study was to analyse and compare a set of 29 countries, with data from 2003 to 2017, regarding the success of the use of ICT at the enterprise level (companies with Internet connection) and at the individual level (people who use computers). The success of the use of ICT was analysed in an economic perspective and the impact of the variables mentioned in the economic growth of each country is estimated by its impact on GDP per capita. In this study, were estimated multiple linear regression models, and were also analysed the trend and evolution of the variables related to the use of ICT by each country. The results show that the countries of central and northern Europe are more developed in the use of ICT, however, the coefficients estimated in the linear regression models suggest that the adequacy of ICT use may not be the most adequate since, in general, only the use of ICT made by companies was favourable to economic growth. Portugal, Ireland, Italy and Luxembourg are the least efficient countries in the period under analysis. On the other hand, the countries of south-east Europe, although in average are below all other countries, are those that present better results of use of

ICT. That is, the use of ICT at both the individual and business levels are positive for economic growth. These countries, with attention to Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Malta, Netherlands, Poland, Romania and Slovakia, show a rapid growth in ICT use over the period 2003 to 2017. This, together with its positive impact on GDP per capita, suggests that the catching up process of these countries is being successful. In sum, although the countries of northern and central Europe continue to be more developed in the use of ICT, there is a rapid advance by the countries of south-east Europe. This suggests that the disadvantaged countries of south-eastern Europe are now recovering not only in quantity but also in quality, adjusting the use of ICTs to economic results, therefore making them more efficient in access and sharing information and knowledge.

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## **“MANAGEMENT AND FINANCING OF SCHOOLS IN PORTUGAL” - THE COURSE OF AN INVESTIGATION BETWEEN INDICATORS, POLICIES AND ACTORS**

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### **ABSTRACT**

*Promoted by some members of Calouste Gulbenkian Foundation, a working and reflection group was created with the objective to analyse the evaluation and accountability processes of the schools, considering the management and financing; the system of autonomy in pedagogical plans (organization of teaching, definition of curricula); financial management (allocation of funds, earning of own resources) and human resources (hiring, training). The Gulbenkian group contacted the Institute of Social Sciences of the University of Lisbon and instructed the at the time sociology of education team of researchers to organize and present credible and informed information on the management and financing of schools. The first part of this project privileged the census and analysis of the various existing legal diplomas and the systematization and interpretation of statistical data. In a second phase of the project, a qualitative methodological approach was used, which utilized several information collection techniques: individual interviews; focus group (students); in-depth analysis of educational projects, regulations, annual plans of activities, autonomy contracts, educational and pedagogical ideals, curricular matrices, norms, disciplinary regime and attendance, educational charters, municipal education guides, minutes and legislation, digital ethnography , parents' associations, students or alumni, their Facebook pages), direct observation in schools (architecture, organization of spaces, dynamics in and out of class, written contents and images). Doing research on a subject that has both sensitive and opaque allowed deep knowledge of a course of work with several setbacks, and also the reflection on the need to look at research as a serious work, based on the empirical evidence carefully collected, selected and updated.*

**Keywords:** *Public Schools, Private Schools, Research, School Funding, School Management*

### **1. INTRODUCTION**

This paper briefly and concisely presents the main results of the Project Management and Funding of Schools, carried out at the invitation of the Calouste Gulbenkian Foundation - Gulbenkian Program Qualification of the New Generations (Pº 132578, December 2013) to the team of Sociology of Education of the Institute of Social Sciences of the University of Lisbon. The study was conducted in two moments, February-June 2014; and April 2015-May 2016. With the consecration of Dec. Law 115-A / 98, "Regime of autonomy, administration and management of pre-school and primary and secondary education establishments", a progressive transfer of powers to public schools was envisaged. has made the central management of the system difficult. In fact, the reorganization of the school network into groups, the transfer to actors and local partners of responsibilities, the introduction of educational projects, internal regulations, etc. specific to each school / grouping function as management tools that promote institutional decentralization. However, let it be said that, even today, the State does not allow centralization of the use of various management and financing instruments.

## **2. THE PATHWAY OF AN INVESTIGATION IN THE MANAGEMENT AND FINANCING OF SCHOOLS**

As mentioned, the study was carried out in two moments. In the first stage, an extensive approach was taken, involving the collection, systematization and interpretation of statistics that allowed the characterization and evaluation of the management and financing of primary and secondary schools in Portugal and the mapping of the entire existing legislative framework, which allowed the identification of dynamics and practices in the management and financing of pre-school and 1st, 2nd, 3rd and Secondary schools. Thus, with regard to the collection of statistical data, it was sought to study the period from 2000 to 2014 by characterizing the school network and the student population; human Resources; success and retention rates; management and autonomy; financing of the education system. However, the information found in the different sources revealed heterogeneity and several degrees of density in the access to effective knowledge of financial data, despite access to a diverse set of privileged informants associated with various state organs of education management. Regarding the normative framework, the main educational policies in Portugal from 1979 to 2014 were surveyed, read and interpreted. Policies that explicitly or implicitly had an impact on the management and financing of schools were explained. Here we have observed the management tools and the school network of public education; the management tools and partnerships with the State in private and cooperative education and, finally, monitoring and evaluation. Also in this exhaustive work of legislative analysis were made several observations on the evolution, trends, problems and gaps of these last years. Also in this first moment of the investigation were interviews with parents / guardians, schools, managers of state entities, teachers, co-opted members of the General Council of Education and municipalities, all institutional representatives and intervenients in the educational process. The need to understand the meanings and meanings attributed to the theme was based on interviews with the aim of clarifying doubts and capturing interpretations of statistical data and legislative trends. The analysis dimensions of this phase of the project were: the dynamic autonomy / centralization; the territorial arrangements; leadership and participation trends; the modes of operationalization of school management for success. In funding, the study sought to identify: financial sources that support school education; financing. In the second phase of the project, which took place between April 2015 and May 2016, the aim was to give voice to field educators by examining them on the meaning attributed to the management and financing of schools. With the qualitative analysis of the discourses of those who, at the local level, is present in the educational communities, it was possible to perceive the meaning and meanings attributed to the management and financing of schools. In this research phase six schools were selected in the Mainland (three in the Lisbon Metropolitan Area, two in the Region of Baixo Mondego and one in the Region of Central Alentejo), which represented social contexts, school organization, and human resources , technical, and financial. The study of these schools made use of several techniques of qualitative character of collection and analysis of information. The first interviews were carried out with the councilors of the education of each one of the municipalities involved, to better fit each educational establishment in the local educational policies. Subsequently, individual interviews were also conducted with the Director; the co-opted element for the General Council (in the case of public schools); to parents / guardians nominated by the Parent Association. At the same time focus groups were held with the students. On the one hand, the technique of interviewing was used; on the other hand, the documentation produced by schools was systematically analyzed: educational projects and internal regulations, annual activity plans and autonomy contracts; educational and pedagogical ideas; administrative regulations; curricular matrices; rules of coexistence, disciplinary regime and attendance.

Digital ethnography, based on an initial observation grid, allowed an analysis of the schools' sites, parents' associations, students or alumni, as well as the respective Facebook pages. The visit to the schools allowed the direct and discreet observation of spaces and interior environments.

### **3. CONCLUSIONS**

The different stages of this study allowed different levels of observation to be drawn and to draw different conclusions. The first one, and that assaulted the team, from the beginning, was that making a picture of the financing and management of the Portuguese education system is a difficult task because the presentation of information is opaque because, as far as to financial data, it is difficult to establish any kind of comparability between indicators as dispersed as distinct, which means that only general conclusions can be drawn. However, if the statistical data and the legislative data are obtained, one obtains observations of a generic nature, with the data collected from the interviews and the six case studies, this does not happen. Here it was possible to capture the processes under study, but that only refer to the unique circumstances of each educational establishment, which did not allow us any extrapolation for the pre-school, 1st cycle, 2nd cycle, 3rd cycle and secondary education. Thus, with regard to the management of public schools, the transfer of competences to the local sphere and the granting of partial autonomy for them to develop educational projects seems to be a fact. For these, autonomy has a central character in the management of the educational system, but it has been found slowly and, as the interviewees point out, incompletely. More, some even point out that designing a school project that often can not be fully met is frustrating. In all observed schools, public or private, there is talk of personal investment in the involvement of networks, partnerships and groups that relate to a common goal. This networking is amplified in the public schools that involve central power, regional directions, municipalities, collegiate schools, educational community, partners, companies providing educational services, parents, etc. With regard to private schools, it maintains contacts with the central authority and the local authority, as well as with careful and appropriate partnerships. In all the case studies we noticed the strong presence of parents of students. Although we know that families are generally interested in children's studies, parents who have a stronger presence at school are middle-class, more educated parents more familiar with the school world. With regard to education funding, the reduction of public financial resources for education and the strong dependence of the education system on community funds are emerging. These funds have been variable taking into account the decision at central level. The transfer of competences from the State to the municipalities entrusted them with responsibility for financing the public education service. The interviews and document analysis of the six case studies have also shown different capacities for funding, services and educational support, thus leaving the strong regional disparities that we know so well.

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# THE RELEVANCE OF PROMOTING GOOD GOVERNANCE MODELS AND MECHANISMS FOR COOPERATIVES SUCCESS: A REVIEW ESSAY

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## **ABSTRACT**

*The purpose of the paper is to discuss the relevance of promoting good governance models and mechanisms for cooperatives success. The author addresses three main research questions: which the appropriate governance models for cooperatives are, which mechanisms and tools could cooperatives implement to support good governance, and what is the role of governance-oriented educational activities in adopting good governance practice. The research was based on the review and critical analysis of theme-relevant literature. The insights from cooperative practice indicate an unused potential of educational activities in fostering adoption of good governance models and mechanisms. The responsibilities of cooperative associations to give access/promote or co-create governance-related educational sources and programs are also addressed. The cooperatives should be made aware of the significance of good governance models and mechanism and education about their implementation for cooperatives success, and the cooperative associations should embrace their role as a key intermediary organization in transferring that knowledge to the key cooperative groups: members, directors and managers.*

**Keywords:** *cooperatives, education, governance mechanisms, governance models*

## **1. INTRODUCTION**

The relevance of good governance practice for cooperatives success has been in the focus of academics and experts over the last decade. The number of theoretical and empirical studies conducted in that research-field shows the interest for adopting good governance practice in the cooperatives. Also, the development of cooperative governance codes, which are in practice in several countries, resulted from the need for guidance expressed by the practitioners of cooperative governance, i.e. cooperatives' members and cooperatives' governance bodies. Despite the differences that arise from the national legal framework, type of cooperatives, industry in which they operate, and other contextual factors, some key recommendations could be adopted by any specific cooperative which thrives for good governance models. As in the corporate sector, the adoption of good governance practice has shown a positive effect on the financial results and total effectiveness of cooperatives (Sapovadia, 2008, Kai-ong, 2012). What is common for both sectors, corporate and cooperative, in the last couple of years, is a raising concern for the greater engagement of owners, i.e. shareholders and cooperative's members, in strategic decision-making processes. Starting from this point, the paper stresses the importance of promoting good governance models and practices for cooperatives' success, with the focus on the educative role of cooperative associations. The author addresses three main research questions: which the appropriate governance models for cooperatives are, which mechanisms and tools could cooperatives implement to support good governance, and what is the role of governance-oriented educational activities in adopting good governance practice. Capacity building in the form of education and training for members and directors is generally acknowledged as a high priority to ensure understanding of good governance principles and their application and is one of the indicators of good governance. Starting from this premise the paper addresses the role of cooperative associations in knowledge sharing and education of

cooperatives' strategic administration, executive management and members of supervision bodies. The paper is organized as follows: after the introductory chapter, a theoretical review of relevant governance models applicable to cooperatives is given in the chapter 2. In the following chapter 3 the key governance mechanisms, tools and conditions of good governance are presented and commented within the context of cooperatives' effectiveness. In the chapter 4 the author elaborates the role of cooperative associations in educating cooperative members, directors and managers, with the special focus on the promotion of good governance models and practices. The concluding remarks are given in the chapter 5 followed by the list of references. The research was based on the review and interpretive analysis of theme-relevant literature. The insights from cooperative practice indicate an unused potential of cooperative associations in fostering adoption of good governance models and mechanisms, which could in the end lead to more effective cooperatives whose influence on local and regional development could be significant.

## **2. A COMPARISON OF ALTERNATIVE GOVERNANCE MODELS**

Governance refers to the set of processes, customs, policies and structures that drive the way an organization is directed, administered and controlled. It usually also includes the relationships with the many stakeholders involved (Ernst and Young, 2012, p. 4). Cooperative governance could be defined as a set of internal and external mechanisms and controls enabling the members to define and ensure attainment of cooperative objectives, securing their continuity and cooperative principles (Banco Central do Brasil, 2008, p. 11). Or, as some other authors say: governance is the way in which directors, and the members who elect them, establish and guide the overall direction of the co-op to ensure its success as a solid business and a co-operative community (CHF Canada, as cited in Ernst and Young, 2012, p. 4). Governance of cooperatives must reflect their multiple social and economic goals: looking after its' members needs while simultaneously remaining competitive in the market and at the same time behave in the interest of their communities' sustainable development. The challenge remains to find an appropriate balance between the principles of good governance and the unique principles and values of the cooperatives, i.e. to find a suitable governance model adjusted to answer the specific needs of one cooperative. In the following section the author discusses alternative governance models and comments their applicability to cooperatives. The analysis is based on the deductive approach: the theoretically and empirically most explored models from corporate sector are compared by their capability to harness the model to serve the purpose (core values) of cooperatives. It starts from the premise that general good governance principles (regarding direction, administration and control) are applicable in both corporate and cooperative sectors with some differences that arise from the purpose of a corporation/cooperative. A comparison of alternative governance models starts with the agency theory. This and other here presented theories are evaluated by their suitability to address the main governance challenge - the balance of many stakeholders' interests, including members, workers, directors, managers and community. The models presented in this section are based on the work of Cornforth (2004). Principal-agent theory, or agency theory, assumes that the owners of an enterprise (the principal) and those that manage it (the agent) will have different interests. The main function of the board is, from this perspective, to control managers, i.e. to ensure managerial compliance (a compliance model). If we apply agency theory to cooperatives some of the problems may occur: the boards of cooperatives usually have a diversity of goals (profitability is a means to an end rather than an end in itself), which do not readily translate into traditional measures of business performance, and managerial actions will be less constrained by market forces. Also, the boards must operate in a context where it is likely to be more difficult to exert influence. Stewardship theory assumes that in general managers want to do a good job and will act as effective stewards of an organization's resources.

As a result, senior management and shareholders (members in cooperatives) are better seen as partners (a partnership model). The main function of the board is therefore to improve organizational performance. From this perspective board members should be selected based on their expertise and contacts, which raises a potential problem for cooperatives, where there is no guarantee that those members elected to the board will have the skills the board needs to be effective. Stakeholder theory (a stakeholder model) is based on the premise that organizations should be responsible to a range of stakeholders. Although there are constraints in cooperatives on the involvement of different stakeholders on boards, as board members are elected from the membership, there have been attempts to develop new multi-stakeholder cooperatives which seek to incorporate different stakeholders in the membership, such as some of the new cooperatives providing social services in Italy (Borzaga and Santuari, 2001, as cited in Cornforth, 2004, p. 5-6). Resource dependency theory views organizations as interdependent with their environment. Organizations depend crucially for their survival on other organizations and actors for resources. The main functions of the board are therefore to maintain good relations with key external stakeholders in order to ensure the flow of resources into and from the organization, and to help the organization respond to external change. Board members are selected for the important external links and knowledge they can bring to the organization, and to try to co-opt external influences (a co-optation model), which represents a constraint in the cooperative sector. Managerial hegemony theory relates to the thesis that although shareholders may legally own and control large corporations, they no longer effectively control them, i.e. control has been ceded to a new professional managerial class. From this perspective the board ends up as little more than a “rubber stamp” for management’s decisions (a “rubber stamp” model). As empirical studies are showing this is truth in normal times (during crisis boards did get involved in strategy). The election of board members from the ordinary members in cooperatives usually means that they are more likely to lack the knowledge and expertise to effectively challenge management proposals and decisions. As some authors are saying, statutory governing bodies exist to review past performance and to endorse management decisions rather than to challenge policies and strategies (Itkonen, 1996, as cited in Cornforth, 2004, p. 6). A democratic or association perspective (a democratic model), a dominant one in the cooperatives, says that the role of the board is to resolve or choose between the interests of different groups and set the overall policy of the organization, which can then be implemented by staff. Central to this view is the idea of a non-professional board, where anyone can put himself or herself forward for election as a board member. This perspective suggests that the job of board members is to represent the interests of members of the organization. Due to the challenges that arise from cooperative sector new multi-paradigm and multi-dimensional perspectives, models and philosophies have been developed, such as a paradox perspective which focuses on paradoxes, ambiguities and tensions involved in governance by embracing them and exploring them, i.e. managing them, rather than choosing between them (Cornforth, 2004, p. 7); a holistic governance model (Young and Thyil, 2008); pluralistic governance (Taylor, 2015), and enlightened cooperative governance philosophy (Ernst and Young, 2012). The theoretical review of alternative governance models has pointed to several governance mechanisms which should be considered when adopting good governance practice. Those and other key governance mechanisms are discussed in the following chapter 3.

### **3. MECHANISMS, TOOLS AND CONDITIONS OF GOOD GOVERNANCE**

The cooperatives operate in different social, cultural, political and legal context. All those environmental factors influence governance tools as well as the cooperative performance vis-à-vis members (Prakash, 2004, p. 4). Some authors have stressed the role of professionalization in promoting good governance. They state that good, honest, objective, loyal, satisfied and dedicated professionals contribute to good governance in cooperative institutions.



It is their duty and obligation to simplify procedures, avoid bureaucratic wrangles, and develop strategies to respond to the needs and demands of cooperative members. Such steps strengthen good governance (Prakash, 2004, p. 9). In cooperative governance three groups require clearly defined rights and responsibilities: members, directors (members of boards) and managers. The relationships between them are the substance of the governance mechanisms. From the characteristics of cooperatives arise several critical questions: Who should serve on boards – lay representatives or experts? What is the primary role of the board – conformance or performance? Should the boards be controlling or partnering the management? And is it possible to include both options rather than choose between them? The good governance practice gives the solutions which embrace those differences rather than choosing between them. For example (as cited in Cornforth, 2004, p. 7-11) Norwegian consumer cooperatives provide training for potential board members and have set a target that “one percent of our members are to be trained as qualified, competent board members”. In addition, they have tried to improve the quality of members seeking to become board members by introducing election committees in each society to select potential candidates. Factors that could enable boards to have greater involvement in strategy making, a key aspect of performance role, without compromising their conformance role are following: the attitudes and experience of board members which could be shaped by board selection processes, board training and by the attitudes of managers to their boards; board processes that manage board agendas so that important, long-term issues are given priority etc. Some of the more successful organizations regularly conduct special meetings where routine board matters are set aside to focus on strategy (Cornforth, 2004). Also, a board cycle could be used where different aspects of the board role are to some degree separated out over time in an annual cycle of board meetings. A paradox perspective suggests that a simple dichotomy between boards controlling or partnering management is too simplistic. Different forms of behavior will be appropriate at different times in the relationship. An important determinant of effective governance was that boards regularly review their relationship with management and how they were working together. A technique called Total Activities Analysis could be helpful, where boards and staff systematically review the organizations main activities and examine who should play what part in carrying them out (Cornforth, 2004). The cooperative practice has indicated following barriers to successful governance: confusion about the role and mission of the co-op, lack of clarity around the purpose of governance, and board’s role, risk of entrenching power among a select group, emerging conflicts between the principles of profitability and social objectives, weak oversight and control mechanisms, lack of clear rules on how to adapt to changes in the market, understanding that cooperatives are private sector enterprises (Ernst and Young, 2012, p. 9), but also democratic degeneration with the growth in size and complexity of the cooperative, and weaker controls of managers, which results in rent-seeking behaviour and wasteful expenses (Shaw, 2007, p. 12). Those detected barriers have motivated the creators of cooperative governance guidelines and codes to sort out following key governance mechanisms: representativeness and participation of members (general assembly agenda and documentation, voting rules, voting procedures, member participation - rights and responsibilities), strategic guidance (roles and duties of strategic administration body - board), executive management (actions and responsibilities, code of conduct and ethical standards, risk policies, dissemination of information), supervision and control mechanism (members, audits, statutory audit committee, audit procedures), performance evaluation, elections and accountability to wider stakeholders. The recommendations that are to be found in several cooperative governance guidelines and codes (listed in the bibliography) are as follows:

- *Independence of board members from executive management.* Clear segregation shall exist between the roles of strategic function administrators (Board of Administration, Board of Directors) and executive function administrators (Executive Board of Directors,

Superintendence, Management, Banco Central do Brasil, 2008, p. 29). The role to be played by executive administrators, when participating in meetings of the strategic administration body, shall be limited to give information and explanations, without performing any role in coordinating in the meeting and even less the conducting and/or participating in decisions (Banco Central do Brasil, 2008, p. 40).

- *Segregation of CEOs and board chairs.* While the leaders of many large co-ops follow this practice, it is not necessarily a tactic that all organizations consider appropriate in their environment. It can be particularly difficult for smaller start-up co-ops to fill two roles of such senior responsibility, given the already onerous challenge they face in attracting members to board positions that can be demanding of both time and expertise (Ernst and Young, 2012, p. 10).
- *Active participation of members.* Participation in cooperative governance could be measured by the member's attendance to the cooperative's General Meetings, by the active participation to votes in General Meetings and elections, by the voice and speaking up behaviors during the cooperative meetings, etc. (Barraud-Didier, et al., 2012, p. 7). Participation of members in cooperative affairs shall be encouraged with the establishment of an environment and instruments enabling members to express themselves and be heard, mainly with the purpose of developing a sense of belonging, property and ability to affect the course of cooperative affairs. Examples are: channels for imparting information to members, alternative and complementary to the General Assembly; periodic meetings and/or pre-assemblies to clarify members on activities and results of the cooperative and establish a favorable environment to capture members' criticism and proposals; channels for receiving suggestions and complaints, where a member may get information on the development of his/her contributions (Banco Central do Brasil, 2008, p. 26). The empirical studies are showing that members participate more in the governance only if they are affectively attached to the cooperative and trust the directors. Affective trust is associated with an investment in terms of time and feelings. Information-sharing and altruistic or helpful behaviors of the directors towards members can therefore contribute to the greater participation of members (Barraud-Didier, et al., 2012, p. 14-15). Active participation prevents the "hitchhiking effect", which emerges whenever individuals feel that their individual contribution represents very little to the whole or fails to enable him to capture individual benefits (Banco Central do Brasil, 2008, p. 13).
- *Effective control mechanisms* should be in place in order to monitor executive management and restrain their power or prevent their dominant orientation towards commercial goals. The growth of a cooperative inevitably expands (or dilutes) ownership and managers become subject to weaker controls. This results in rent-seeking behavior and wasteful expenses. Several studies have shown that the tendency for the diminishing role of membership in governance is linked to the expansion of the co-operative and a growing domination of commercial values fostered by a professional management distanced from co-operative values (Meister, 1984; Malo and Vezina, 2004, as cited in Shaw, 2007, p. 12). The challenges of the governance of large cooperative business is analysed in Birchall, 2017.
- *Expertise of governance bodies' members.* \* The directors and executive managers should have appropriate set of skills and knowledge in order to fulfill their duties. It is crucial for the members of the board of directors not to be passive receivers of information, but to have the knowledge to supervise the executive management in the strategic decision-making process. A demonstrable commitment to fostering a culture of ethical behavior, strong industry knowledge and depth of contacts are also valuable factors to consider (Ernst and Young, 2012, p. 12). Education and training, formal or informal, are the key activities to

gain/develop the required expertise, but there is also a possibility to co-opt board members to bring in people who already have the right set of skills and knowledge.

- *Dissemination of information as a prerequisite of qualitative collective decision-making.* Participating requires information, knowledge and ability to decide. Administrators with executive duties shall secure to members of the strategic administration and supervision bodies full access to the cooperative premises, information and documents needed in the performance of their respective tasks. Information shall emphasize the most important aspects and be made available in a timely, regular and reliable way, enabling comparisons and managerial assessment. Administrators with executive functions shall secure that cooperative members know the financial standing, performance, and management and businesses policies of the cooperative, by clearly publicizing, in adequate wording, all relevant facts. Dissemination of information shall meet the expectations of cooperative members, using adequate channels, under the best possible cost-benefit relation (Banco Central do Brasil, 2008, p. 41).
- *Transparency and disclosure* are closely related to the dissemination of information. Cooperative members have a right and duty to understand the real conditions of the cooperative, in order to make conscious and responsible decisions. IT applications could be a helpful tool to promote greater transparency. Full and transparent disclosure on sensitive issues such as director competency, director attendance, director fees and general accountability of the board is an important way to sustain the trust (Ernst and Young, 2012, p. 14).
- *Codes of conduct and ethics codes in place for members, directors and managers.* \* The cooperative shall have in place a code of conduct providing guidance to actions of administrators with strategic and executive duties, Statutory Audit Committee and employees, expressing the ethic standing of the cooperative and its applications to daily activities. This code has also the purpose of establishing a standard of relationship with the different publics of interest of the cooperative: members, employees, partners, suppliers, service providers, competitors, society, government and community where the cooperative operates. An organizational culture encouraging ethical behavior could be even more important (Banco Central do Brasil, 2008, p. 38-39). The strategic administration body shall ensure that the conduct code and ethical standards of the cooperative are fulfilled by every member of the institution – including the administrators themselves and the cooperative employees (Banco Central do Brasil, 2008, p. 33).
- *Non-operating committees.* It is recommended that the strategic administration body, provided the size and financial conditions of the cooperative so permit, establishes non-operating committees in charge of analyzing strategic issues and monitoring the cooperative management, such as risk, credit policy, compensation of executive administrators, cooperative reorganization etc. (Banco Central do Brasil, 2008, p. 35).
- *Preventing “non-substitutable” board members – succession planning.* \* Newly inaugurated members of the strategic administration body shall receive information needed for their effective action – including knowledge of the cooperative history, structure, procedures, systems, markets and competitors, knowledge of regulating bodies policies, rules of the strategic administration body – and be furnished with documents such as yearly reports, minutes of Assemblies and ordinary meetings, opinions of the Statutory Audit Committee and Auditors, strategic planning, detailed economic and financial conditions (Banco Central do Brasil, 2008, p. 35). Progressive organizations create procedures for recruiting potential new board members and establish intern officer programs to attract young talent, and use structural opportunities like committees and working groups to cultivate new talent. This is especially important if there are a significant number of board

members approaching retirement. Passing along the organizational history and “board memory” supports continuity of operations and visions (Ernst and Young, 2012, p. 13).

- *Performance / governance evaluation.* \* The cooperatives shall have in place performance indicators as well as some of the indicators of good governance which could relate to the following areas: fair dealings, transparency in business, objective and fair decision making, ability to change with the times, respect for the members and their household members, clean and fresh work environment, education and training of members and office bearers, professionalization of employees, proper and genuine interaction between the management and office-bearers, concern for the community and environment etc. (Prakash, 2004, p. 2).
- *Parameters for comparison with other cooperatives.* Administrators with executive functions shall establish parameters for comparisons with other cooperatives, especially in what relates to administrative costs vis-à-vis revenues, risk exposure and default levels. The comparisons shall be made available to cooperative members. Comparison parameters are an important tool in decision making (Banco Central do Brasil, 2008, p. 42).
- *Governance model that reflects multiple goals of cooperatives.* Cooperatives should adopt multi-dimensional and multi-perspective governance models that enable the exercise of multiple interests.
- *Education on cooperative governance.* \* Cooperatives shall permanently promote education of its members in the field of cooperative governance. Capacity building in the form of education and training for members and directors is generally acknowledged as a high priority to ensure understanding of good governance principles and their application (Shaw, 2007, p. 34). The need for effective education and training for co-operative and mutual boards is now generally accepted within the UK. It forms an important element in the Corporate Governance Code of Best Practice finalized in 2005 by Cooperatives UK. Many consumer societies, in conjunction with the UK Cooperative College, run education programmes for members and directors on a wide range of corporate governance issues (Cooperatives UK, 2019).
- *Selection and training of managers in tune with cooperative principles and values.* \* Many authors emphasize the importance of the selection and training of managers in tune with core social cooperative values (e.g. Davis, 2004, p. 64). This process could be aided by the development of appropriate training courses and educational institutions together with a code of conduct (Shaw, 2007, p. 13).

To develop a successful cooperative model some key elements should be ensured: promoting member proximity, branding and competitiveness. One of the greatest challenges to cooperative board effectiveness is managing member proximity – that is, ensuring regular, frequent and meaningful interaction with members. The following five factors have been proven to be crucial in that context: governance structure and management that gives priority to member needs, distribution channels adapted to member needs, effective change management and sound communication, significant technology investments to support electronic communication as a supplement to person-to-person interaction (Ernst and Young, 2012, p. 5-6). In branding strategies cooperatives can take advantage of their social impact within their communities. Also, members who are more informed and aware of the impact of co-ops in their community may be more likely to feel personally motivated and rewarded by participating more explicitly in its activities (Ernst and Young, 2012, p. 7). To stay competitive, co-ops need to be able to quickly adapt to evolving market trends and to leverage the components of an agile governance structure: member participation and independence of the board members, breadth of expertise and director competencies, and other characteristics of the board such as board size, length of service etc. (Ernst and Young, 2012, p. 8-13). An important component of success is the degree to which a co-op has implemented specific tools dedicated to supporting good governance, such

as: a reference document on shared values and a code of ethic; a code of conduct and/or ethics; a formal process of director assessment/self-assessment in which each board member prepares an evaluation of the entire board's performance for the year, quarter or other period of activity; a risk map providing insights on trends and challenges to objectives and operations; a dashboard to track performance indicators; management accountability, such as when management presents annual (or quarterly, trimester, etc.) results in a formal presentation to the board; strategic project monitoring (Ernst and Young, 2012, p. 14). The key governance mechanisms and tools discussed in this chapter are rooted in the human capital led strategies to people management which serve to the goal of creating a sustainable community within and outside the cooperative. The mechanisms marked with \* reflect some of the key activities of cooperative HRM process as presented in Davis (2004, p. 9 and p. 21): recruitment, selection, performance management and managing culture change. The open-book policy, the servant-leader model of management, the selection processes that emphasize the fit between organizational and individual values, the professional codes of conduct for managers, the motivation strategies that are based on intrinsic, value-driven motivators, the utilization and development of human potentials, and the multi-stakeholder management models are practices that are getting more attention not only in cooperative but also in corporate sector, especially in socio-economic enterprises, such as Benefit Corporations (B Lab, 2019) or so called "small giants" (Burlingham, 2007). The challenge of creating an inspiring work environment which produces highly engaged workers/members/managers/directors is a common concern for both sectors. The focus of this paper is on the quality of applied cooperative governance models and mechanisms that could be improved through the well defined and constantly upgraded educational programmes/activities. However, the cultivation of cooperative value-based management culture (Davis, 2004, p. 51) as opposed to the strong CEO led culture should not be neglected. Within that context the relevance of managers and directors' recruitment and selection processes gains its significance, as they are the main creators (influencers) of organizational culture. Some key institutional-level actions that could bring a positive change in that area could be, as some authors have previously stressed, for example: development of validated, postgraduate-level cooperative management development programmes in formats that are low-cost and accessible for practicing managers covering the major sectors (equivalent to an MBA); development of cooperative professional and executive recruitment consultants in the regions; establishment of global professional association for cooperative managers, with its own journal and professional examinations, and with codes of practice and supervision of professional conduct and development; and others (Davis, 2004, p. 155). High quality educational programmes/activities are a way to attract, develop and retain managers, but not only managers as this paper is clearly stating.

#### **4. THE ROLE OF COOPERATIVE ASSOCIATIONS IN PROMOTING GOOD GOVERNANCE MODELS AND MECHANISMS**

As in corporate sector the cooperatives are also searching for and trying to adopt best governance practice, i.e. good cooperative models and mechanisms. For example, long established cooperatives in the UK and Belgium have been developing strategies to promote active membership engagement, implementing better standards of governance and developing ethical trading strategies (Develtere et al, 2005, Croft, 2006, as cited in Shaw, 2007, p. 9). The cooperative associations could play a significant role in helping cooperatives reaching best governance practice. By offering programmes (or access to programmes) on a wide range of relevant governance issues, cooperative associations could support the adoption of best governance practice among the cooperatives. Those programmes could be developed/intended for members, directors, executive management or/and members of supervision bodies. Also, it is recommendable that those programmes include best practice reports (e.g. iCareCoops, 2015),

models of innovative governance systems (e.g. the Mondragon Cooperative Corporation), and examples of existing cooperative governance codes, guidelines, codes of conduct etc. When considering the educative role of cooperative associations, the role of cooperative federations should not be neglected. These institutions, through their ethical governance, set an example of a "Role Model" for others to follow (Prakash, 2004, p. 8), but that is beyond the scope of this paper. As one of the seven cooperative principles education, training and information represent a critical set of factors by which cooperatives put their values into practice. In the ICA statement it is clearly noted that cooperatives provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their cooperatives (ICA, 2019). Several studies have indicated that inappropriate governance and management represent important obstacles to the development of cooperatives (e.g. Borzaga and Galera, 2012, p. 16-17). This paper points out the role of cooperative associations in promoting good governance models and mechanisms among cooperatives, i.e. their members, directors, and managers. As the current practice shows, there is a significant room for progress in governance-oriented educational activities. Good practice (e.g. CONFCOOPERATIVE, LEGACOOOP) includes on-line courses, videoconferences and library with governance-relevant scientific papers as supporting tools, and agreement with the national Ministry of public education as a mechanism to improve collaboration between educational institutions/researchers and cooperatives (also in creating programmes). Cooperative associations could also gain valuable information that can help in developing programmes by continuously testing educational needs through on-line questionnaire or other instruments. For comparison purposes some standard indicators of governance-oriented educational activities should be established, such as: transparency in organization of educational programmes: publicly available statistics per year (number of programmes, number of attendants, category of attendants ...); central point (web portal) for governance-related research and educational material which is a good platform of collaboration between academics/experts and cooperative associations/cooperatives or research network, e.g. the Canadian Co-operative Research Network (CCRN-RCRC, 2019), or e-library; number of collaborations with HE institutions in creating governance-related curriculums; supporting cooperatives in establishing appropriate governance model (advising activities); supporting cooperatives in measuring return on investment in governance-related education (not only financial returns); number of intermediated studies/researches (through enabling contacts between academics and cooperative practitioners). In order to create appropriate educational programmes, the level of activity of cooperative members, i.e. active engagement in governance, and other governance problems should be searched for. That can contribute to future research in this area.

## **5. CONCLUDING REMARKS**

Cooperative associations should give access/promote or co-create governance-related educational sources and programmes. The programmes shall present to the cooperatives the multi-paradigm and multi-dimensional governance models, as well as innovative governance models, mentioned in this paper. The here presented key governance mechanisms shall be examined, and the benchmarking method shall be used in order to adopt best governance practice. Effective cooperatives, which use good governance models and mechanisms, could play a significant role in fostering local and regional development, i.e. in poverty and unemployment reduction, in strengthening the culture of solidarity and mutual enhancement and in awakening the sense of interdependence, i.e. mutual destiny. Cooperative associations, as the paper shows, should embrace their role as a key intermediary organization between higher education institutions/cooperative experts and cooperative members. The research was limited by the availability of secondary data but offers valuable inputs for future primary research of the topic.

The results of the paper could be of interest to the cooperative associations, cooperative members, directors and managers, to the higher education institutions, students, cooperative experts and researchers who acknowledge their responsibility in the cooperative governance issues.

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## IMPROVEMENT POSSIBILITIES OF THE EUROPEAN BUSINESS EXCELLENCE MODEL

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### ABSTRACT

*Companies striving for better business performance and efficiency may use definite quality improvement methods that guarantee the improvement of business results. Business excellence models is one of the instruments used by the companies with the aim to succeed. European Foundation for Quality Management defined the benchmarking guidelines of EFQM business excellence model in early 90-ies of the 20th century, and keep them updating periodically. The excellence model is a structure envisaged for the interpretation of excellence guidelines in performance. In order to facilitate the benefits from the EFQM adoption in the company, the management shall initially ensure the compliance of the business activities to the aforementioned excellence benchmarking guidelines. If the company fails to understand and accept the guidelines entirely, the mastering of the model can be complicated and even pointless for any type of the business. EFQM guidelines serve to analyse the performance of the company and justify the adoption of the model in the level of top management. The aim of paper is to explore the improvement possibilities of the performance quality assessment in Latvian enterprises, basing on EFQM business excellence model. The hypothesis is: improving the EFQM business excellence model used in the performance quality assessment in Latvian companies by including important topical criteria and integrating them into conventional criteria of the model could to drive it to higher level of excellence. The tasks: to study the principles of European business excellence model; to assess and verify by Latvian and foreign business excellence and quality experts the assumptions included in the EFQM business excellence model with author's improvements; to draw the conclusions and make proposals.*

**Keywords:** Business excellence, EFQM, model

### 1. INTRODUCTION

According to the statements by L. Porter and S. Tanner, the EFQM business excellence model is a substantial tool of diagnostics providing to the stakeholders learning opportunities aimed to realize the strengths of the company and to discover the possibilities of improvement. (Porter, Tanner, 2001). Besides, the aforementioned model can give a company the chance to calculate the difference between the best practice and actual performance (Sampaio, Saraiva, Monteiro, 2012, p.183). Due to the model's popularity, practicableness and wide applicability the author chose it as a basic tool for further research and elaboration of the practical part of her study. The author pointed out that a company can avoid the waste of resources thorough assessment of initial activities, enabling the possibility to channel these resourcees to the business operations that would facilitate the implementation of business excellence guidelines. The aim of paper is to explore the improvement possibilities of the performance quality assessment in Latvian enterprises, basing on EFQM business excellence model. The hypothesis is: improving the EFQM business excellence model used in the performance quality assessment in Latvian companies by including important topical criteria and integrating them into conventional criteria of the model could to drive it to higher level of excellence. The tasks: to study the principles of European business excellence model; to assess and verify by Latvian and foreign business excellence and quality experts the assumptions included in the EFQM business excellence model with author's improvements; to draw the conclusions and make proposals. In order to complete the task set by the author regarding the need of EQFM improvement, first

and foremost it is necessary to study the guidelines of the EFQM business excellence model and changes to the standard ISO 9001:2015 to identify the corresponding improvable components of the EFQM business excellence model.

## 2. DISCUSSION

The EFQM Excellence Model is based on a set of European values, first expressed in the European Convention on human Rights (1953) and the European social Charter (revised in 1996). This treaty is ratified by the 47 member states of the Council of Europe and the principles are incorporated into national legislation. The Fundamental Concepts of Excellence build on the foundation of these basic human rights, assuming they are universally applied. Recognising the role business can play in supporting the broader goals of the United Nations(UN), the UN global Compact (2000) was established.(Ghicajanu, Irimie, Rares, 2015). This initiative encourages organisations to actively apply these values, set out as principles for sustainable and socially responsible business, across their global operations. Whilst a number of these principles are explicitly covered in the EFQM Excellence Model, a number are implicit, including those relating to human rights, corruption, bribery and forced labour, as these are already a legal requirement within Europe. EFQM Business excellence model can see 1.Fig.

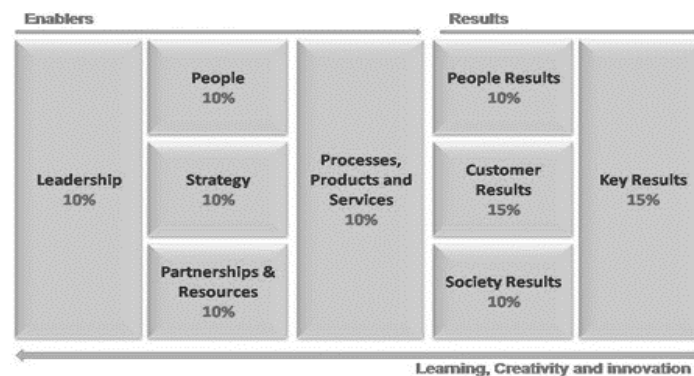


Figure 1: EFQM Business excellence model [Heras-Saizarbitoria, I., Marimon, F., Casadesús, M. 2012].

Model has 9 criterion (Leadership, People, Strategy, Partnership and Resources, Processes, Products and Services, People results, Customer results, Society results, Key results) and 32 sub-criterion. Model has 2 parts-Enablers and Results. Total Core 1000 points-500 as Enablers and 500 as Results part. Model based on Fundamental Concepts of Excellence. They are (Sampaio P., Saraiva P., Monteiro A. 2012):

1. Adding Value for Customers. Excellent organisations consistently add value for customers by understanding, anticipating and fulfilling needs, expectations and opportunities.
2. Creating a Sustainable Future. Excellent organisations have a positive impact on the world around them by enhancing their performance whilst simultaneously advancing the economic, environmental and social conditions within the communities they touch.
3. Developing Organisational Capability. Excellent organisations enhance their capabilities by effectively managing change within and beyond the organisational boundaries.
4. Harnessing Creativity & Innovation. Excellent organisations generate increased value and levels of performance through continual improvement and systematic innovation by harnessing the creativity of their stakeholders.
5. Leading with Vision, Inspiration & Integrity. Excellent organisations have leaders who shape the future and make it happen, acting as role models for its values and ethics.
6. Managing with Agility. Excellent organisations are widely recognised for their ability to identify and respond effectively and efficiently to opportunities and threats.

7. Succeeding through the Talent of People. Excellent organisations value their people and create a culture of empowerment for the achievement of both organisational and personal goals.
8. Sustaining Outstanding Results. Excellent organisations achieve sustained outstanding results that meet both the short and long term needs of all their stakeholders, within the context of their operating environment.

2015 brought significant changes to the ISO 9000 standards. Subsequently, the author considers important to take into account these changes upon identification of the assumptions to be included into the improved EFQM business excellence model, therefore a general overview of standard sections and comments on necessity of inclusion of other particular issues and their usefulness in context of the improved EFQM business excellence model are provided. The changes in approach of application are also reflected in the sections of the new ISO 9001: 2015 standard that are displayed in Table 1.

*Table 1: Sections of standard ISO 9001:2015[Quality Management Systems. Requirements, 2015].*

No.	The parts of Standard
1.	Scope
2.	Normative References
3.	Terms and Definitions
4.	Context of the Organization:
4.1.	Understanding the organization and its Context
4.2.	Understanding the needs and expectations of interested parties
4.3.	Determining the scope of the quality management system
4.4.	Quality Management System and its processes
5.	Leadership:
5.1.	Management commitment:
5.2.	Quality Policy;
5.3.	Organizational roles, responsibilities and authorities
6.	Planning;
6.1.	Actions to address risks and opportunities
6.2.	Quality Objectives and planning to achieve them
6.3.	Planning of changes
7.	Support
7.1.	Resources
7.2.	Competence
7.3.	Awareness
7.4.	Communication
7.5.	Documented Information
8.	Operation;
8.1.	Operational planning and control
8.2.	Determination of requirements for products and services
8.3.	Design and development of products and services
8.4.	Control of externally provided products and services
8.5.	Production of products and services
8.6.	Release of products and services
8.7.	Control of nonconforming processes outputs, products and services
9.	Performance evaluation
9.1.	Monitoring, measurement, analysis and Evaluation
9.2.	Internal audit
9.3.	Management review
10.	Improvement
10.1.	General
10.2.	Nonconformity and corrective action
10.3.	Continual Improvement

Risk assessment-based thinking allows the organization to diagnose factors that could create derogations from its processes and the forecasted results of the quality management system, apply preventively the management tools and methods to reduce negative impacts and take the new opportunities, which is essential for a company striving for business excellence. Risk-assessment based analysis is important in order to achieve an efficient quality management system. The concept of risk-based thinking has been indirectly included in the previous issues of the international standard ISO 9001, i.e. in application of preventive measures aimed to dissolve possible incompliances, analysing of any emerged incompliances, carrying out the activities proportional to the impact of incompliance in order to prevent the repetition of inadequacy.( Hunt, Dominguez, Williams, 2016). In order to comply with the requirements of the aforementioned international standard, the organization must plan and implement the activities that include risks and opportunities.( Abuhav, 2017). Risk consists of the impact of incertitude, which can be positive or negative. Risk-based positive deviation can give the opportunity, but not all positive impacts of risk will. Therefore, thinking of companies striving for excellence from the point of view of a successful business, risk assessment must be included in EFQM business excellence model.( Peckford, 2016). Based on ISO 9001:2015 Standard new parts the author pointed out that a comprehensive information analysis one of the most important aspects to be included in the EFQM model and put among the main criteria, since it is the base of successful business. Information analysis can include the data on external environment and the results can be applied in order to increase the competitiveness of the company. Basing on guidelines of EFQM business excellence model and standard sections of ISO 9001:2015, the author suggest to add to the criteria of leadership and strategy “the principles of sustainable development and risk assessment”. It means that nowadays the business should definitely take into account the sustainable development, taking care of environment, work environment and society in general, which is possible only under guidance of strong leader and well-elaborated business strategy. (Hoyle, 2017, p.147). As for the criterion “Products, services and processes”, it should include sustainable development. It means, that organizing its business the company must use not only environmentally friendly technologies, but also consider the broadening the range of environment-friendly products. (Robitaille, 2015, p. 27). The sub-criterion “Social perception” must be supplemented by the improvement of company’s image, adding the sustainability component. (Cianfrani, West, 2015, p.112). The efficiency indexes of this criterion should include the solutions of the environmental problems, thus pointing at the fact, that environment effects are important to the company striving for excellence in business performance.(Cochran, 2015). And last, but not least criterion suggested by the author is “Business sustainability” related to the impact of the projects related to natural, working and social environment, which is an integral and significant part of business excellence.( Peckford, 2016, p. 68). The assessment of the existing criteria of different business excellence models and changes introduced in standard ISO 9001:2015, considering the guidelines of business excellence model, during the research the author suggests several assumptions for approbation that could essentially improve the EFQM business excellence model to ensure more effective implementation. These assumptions include Internal and external suppliers; Labour safety and healthcare; Risk assessment; Suppliers; Business excellence; Improvement; External environment of the company and its impact; Comprehensive information analysis and risk assessment; Business sustainability. In order to prove the hypothesis, in June-July 2018 the author carried out the survey of 20 experts – 8 experts from Latvia and 12 experts from abroad with proper experience in assessment of EFQM business excellence model. All persons included in experts’ list are appreciated Latvian and foreign EFQM and quality management specialists; therefore, their participation is of high value. Thus, for instance, among Latvian experts in the survey took part Adela Vitkovska,

whose personal qualification is EFQM internal assessor, which means a certification with right to participate in assessment of EFQM business excellence model implementation process as full-scale evaluator. Another expert was Vanda Novokšonova, member of the board of Eurofortis, a licensed EFQM IAT coach and the assessor of EQFM Excellence award. One more opinion was provided by Inese Didže, director of Dobeļe State Gymnasium, representative of GOA-Solutions® (Expert of EFQM excellence model). Latvian experts shared their experience and exchanged opinion with Andriano Ruchini, a qualified assessor of EQFM business excellence model from Italy, Dimitra Bartozoulidou from Greece, who represented EFQM organization and works at Certification department.

*Table 2: Experts' evaluations regarding the importance of EFQM model criteria, sub-criteria and particular aspects in the common EFQM model [Author's calculations according to data of survey carried out by the author in 2018 (n=20)]*

Criterion/sub-criterion	Arithmetic mean	Mode	Median	Standard deviation	Significance of the criterion in the model
1. Criterion: <i>Leadership</i> (Proportion of the criterion in model 10)	9.6	10	10	0.3	9.7
Sub-criterion. 1.a Leaders develop the mission, vision, values and ethics and act as role models. Proportion of the sub-criterion in criterion 15.2	9.3	9	10	0.5	9.4
Sub-criterion 1.b Leaders define, monitor, review and drive the improvement of the organisation's management system and performance. Proportion of the sub-criterion in criterion 13.5	8.0	8	8	0.4	8.3
Sub-criterion 1.c Management encourages the creation, implementation and continuous improvement of efficient management system basing on principles of sustainable development and risk assessment and taking into consideration both short and long term goals. Proportion of the sub-criterion in criterion 14.6	8.8	9	9	1.3	9.0
Sub-criterion 1.d Leaders engage with external stakeholders. Proportion of the sub-criterion in criterion 13.8	8.8	9	9	1.0	8.5
Sub-criterion 1.e Management sustains the culture of excellence among employees basing on sustainable development. Proportion of the sub-criterion in criterion 15.3	9.5	9	9	1.6	9.5
Sub-criterion 1.f Leaders ensure that the organization is flexible and manage change effectively. Proportion of the sub-criterion in criterion 12.9	8.3	8	8	1.7	8.0
Sub-criterion. 1. g Management identifies the necessary changes to the company and leads their implementation basing on principles of sustainable development and risk assessment in long term. Proportion of the sub-criterion in criterion 14.6	8.3	8	8	1.9	9.0
2. Criterion – <i>Strategy</i> . (Proportion of the criterion in model 9.5)	9	9	10	0.1	9.2
Sub-criterion 2.a: Strategy is based on understanding the needs & expectations of both stakeholders and the external environment. Proportion of the sub-criterion in criterion 16.8	9.3	9	10	1.3	9.1
Sub-criterion 2.b: Strategy bases on understanding of needs and wishes of the interested stakeholders and external environmental requirements in terms of sustainable development as well as on risk assessment. Proportion of the sub-criterion in criterion 17.3	9.0	8	9	1.2	9.4
Sub-criterion.2.c: Strategy bases on assessment of current situation and potential opportunities. Proportion of the sub-criterion in criterion 16.2	8.5	8.5	9	1.4	8.8
Sub-criterion 2.d: Strategy bases on assessment of current situation and sustainable development. Proportion of the sub-criterion in criterion 15.5	8	8	9	1.2	8.4
Sub-criterion 2.e: Strategy and the respective supporting activities are elaborated, reviewed and updated according to the	9.5	9	9	1.5	9.6

principles of sustainable development and risk assessment. Proportion of the sub-criterion in criterion 17.7					
Sub-criterion 2.f: Strategy and supporting policies are communicated, implemented and monitored. Proportion of the sub-criterion in criterion 16.6	8.8	9	8	1.1	9.0
3. Criterion - <i>People</i> (Proportion of the criterion in model 10)	9.5	10	9	1.1	9.7
Sub-criterion.3.a: People plans support the organization's strategy. Proportion of the sub-criterion in criterion 14.2	8.3	8	8	1.0	8.7
Sub-criterion.3.b: Staff employment bases on equal opportunities of the employees, ethic conducts and sustainable thinking. Proportion of the sub-criterion in criterion 14.1	8.0	8	8	1.8	8.6
Sub-criterion 3.c: Inclusion of employees with special needs in work environment. Proportion of the sub-criterion in criterion 12.9	7.5	7	7.5	0.9	7.9
Sub-criterion.3.d: People's knowledge and capabilities are developed. Proportion of the sub-criterion in criterion 14.3	9.0	9	9	0.7	8.7
Sub-criterion 3.e: People are aligned, involved and empowered. Proportion of the sub-criterion in criterion 13.8	8	7	7.5	1.3	8.4
Sub-criterion. 3.f: Efficient employees' communication system and reduction of the related risks. Proportion of the sub-criterion in criterion 15.7	9.8	10	9	0.3	9.6
Sub-criterion 3.g: People are rewarded, recognised and cared for. Proportion of the sub-criterion in criterion 14.9	9.0	9	9	1.0	9.1
4. Criterion: <i>Partnerships &amp; resources</i> . (Proportion of the criterion in model 9.5)	9	9	9	0.6	9.2
Sub-criterion 4.a: Partners and suppliers are managed for sustainable benefit. Proportion of the sub-criterion in criterion 22.1	9.8	9	10	0.5	9.7
Sub-criterion 4.b: Finances are managed to secure sustained success. Proportion of the sub-criterion in criterion 18.5	8.3	8	8	1.1	8.1
Sub-criterion 4.c: Buildings, equipment, materials and natural resources are managed in a sustainable way. Proportion of the sub-criterion in criterion 19.9	9	9	9	1.3	8.7
Sub-criterion 4.d: Management applies technologies to support the strategy implementation in long term. Proportion of the sub-criterion in criterion 20.1	9	8	9	1.3	8.8
Sub-criterion 4.e: Managed information and knowledge, assessment of the related risks in order to support the adoption of efficient decisions and increase the competitiveness of the company both in short and long term. Proportion of the sub-criterion in criterion 21.2	9.0	9	9	1.3	9.3
5. Criterion: <i>Processes, products &amp; services</i> . (Proportion of the criterion in model 10)	9.5	9	9.5	0.3	9.7
Sub-criterion 5.a: Elaboration and management of processes in order to increase their value according to the needs of interested stakeholders, assessment of possible risks. Proportion of the sub-criterion in criterion 19.5	8.5	9	8.5	0.6	8.9
Sub-criterion.5.b: Development of products and services in order to increase their value according to the customers' needs in long term. Proportion of the sub-criterion 20.6	9.0	9	9	1.0	9.4
Sub-criterion 5. c: Products and services are effectively promoted and marketed. Proportion of the sub-criterion in criterion 18.2	8.5	8	8.5	1.4	8.3
Sub-criterion 5.d: Products and services are elaborated, supplied and lead according to the principles of sustainable development. Proportion of the sub-criterion in criterion 20.6	9.0	9	9	1.0	9.4
Sub-criterion 5.e: Company improves relationship with customers basing on principles of sustainable development. Proportion of the sub-criterion in criterion 21.2	9.3	9	9	0.7	9.6
6. Criterion: <i>Customer results</i> . (Proportion of the sub-criterion in criterion kritērija īpatsvars modelī 10)	10.0	10	10	0.1	10

Sub-criterion.6.a: Perceptions. ( Reputation and image,product and service value,product and service delivery,Customer service, relationship and support, Customer loyalty and engagement. ) Proportion of the sub-criterion in criterion 53.3.	9.8	9;10	10	0.4	9.8
Sub-criterion 6.b: Performance Indicators. ( product and service delivery,Customer service, relationships and support,Complaints handling,Involvement of customers and partners in the design of products, processes,etc. Proportion of the sub-criterion in criterion 46.7	8.8	9	9	0.9	8.6
7. Criterion: People results. (Proportion of the sub-criterion in criterion kritērija īpatsvars modelī 10)	10.0	10	10.0	0.1	10
Sub-criterion 7.a: Perceptions. satisfaction, involvement and engagement, Motivation and empowerment,Leadership and management, Competency and performance management,training and career development,Effective communications,working conditions. Proportion of the sub-criterion in criterion 53.5	9.8	9	10	0.3	9.9
Sub-criterion 7.b: Performance Indicators. Involvement and engagement activities,Competency and performance management activi- ties,Leadership performance, training and career development activities, Internal communications. Proportion of the sub-criterion in criterion 46.5	8.8	8;9	9	0.3	8.6
8. Criterion: Society results. (Proportion of the criterion in model 10)	9.5	9	9.5	0.2	9.7
Sub-criterion 8.a: Perceptions. Image of the organization – as employer, responsiveness in contacts; performance of organization as a responsible member of the society – ethical conducts; role of the organization in the life of the local community – involvement in education and training – support in sports and recreation activities, accidents and health risks, noises and smells, image regarding the sustainability assurance. Proportion of the sub-criterion in criterion 53.6	8.8	9	9	0.8	9.0
Sub-criterion 8.b: Efficiency indexes. Cooperation with authorities in such issues as certification, import/export, new products, solutions of environmental problems. Proportion of the sub-criterion in criterion 46.4	7.5	8	8	1.1	7.8
9. Criterion: Business results. (Proportion of the criterion in model 10)	9.8	10	9.5	0.6	9.7
Sub-criterion 9.a: Business Outcomes. Financial outcomes,Business stakeholder perceptions,performance against budget,Volume of key products or servicesdelivered,key process outcomes). Proportion of the sub-criterion in criterion 51.6	9.5	9	9	0.5	9.8
Sub-criterion 9.b: Business Performance Indicators. Financial indicators,project costs,key process performance indicators,partner and supplier performance,technology, information and knowledge). Proportion of the sub-criterion in criterion 48.4	9.3	9	9	0.2	9.2
10. aspect “ External environment of the company and its impact”. Proportion of the sub-criterion in criterion Aspekta īpatsvars modelī 90	9.0	9	9	0.9	9.3
11.aspect” Comprehensive information analysis and risk assessment”. Proportion of the aspect in model 90	8.5	9	9	0.3	8.8
12.aspect. Business excellence 100	9.7	10	9.5	0.2	9.9
13. Criterion: Business sustainability.(Proportion of the criterion in model 100)	9.6	10	10	0.2	9.7

*Rating scale 0-10, where 0- criterion is not important for the inclusion in EFQM model, 10 – criterion must be included in EFQM model.*

To summarize the opinion of the experts the author used Google Forms questionnaire aimed to find out the importance of different criteria, sub-criteria and particular aspects of EFQM business excellence model offered by the author in the context of common EFQM model. Basing on evaluations provided the author elaborated an improved EFQM excellence model.

The author applied the rating scale from 1 to 10, where 1 meant that the criterion, sub-criterion or aspect was not qualifying for inclusion in EFQM model, but 10 meant that the criterion, sub-criterion or aspect must be included in the model. In addition to the importance of criteria and sub-criteria in the common model, the experts had to assess the “weight” of each of the indicated criteria, sub-criteria and aspects. The author concludes that in total the importance and “weight” have been assessed similarly due to the experience and perception of the experts regarding the significance of the criterion, its impact to the competitiveness or role in excellence of the company. Different personal experience could generate some particular differences in ratings. At the end of the questionnaire, the experts had the opportunity to express their opinion regarding the criteria, sub-criteria and aspects that should be included in EFQM business excellence model providing the “weight” of the elements in the model, respectively. Due to the fact, that some aspects, such as “Internal and external suppliers”, “Risk assessment” and “Improvement” scored less than 5 points, the author excluded them from the approbated model. According to the table, in total the expert evaluations, the dominating values in rating of the criteria, sub-criteria and particular aspects were 8 to 10 points out of 10, which means, that the overall rating of the elements included in the questionnaire was high with few exceptions. The new EFQM business excellence model should include such important aspects as the external environment and its impact on the company, comprehensive information analysis and risk assessment, and business excellence. Experts participating in the approbation of the model named all aforementioned criteria important. Thus, for instance, the mean value of the aspect “External environment and its impact on the company” was 9 (Mode-9, median-9). The mean value of the aspect “Comprehensive information analysis and risk assessment” was 8.5 (mode-9, median-9). The mean value of the criterion “Business sustainability” was 9.2 (mode-9, median9-9.0), meanwhile the mean value of the sub-criterion “Indexes of the impact from the projects related to nature, working and social environment” reached 9.5 (mode-9, median-9.0). Thus, the high importance of the improvements suggested by the author and approved by the experts in the context of common EFQM business excellence model are proved, concluding, that these criteria should be included in the model.

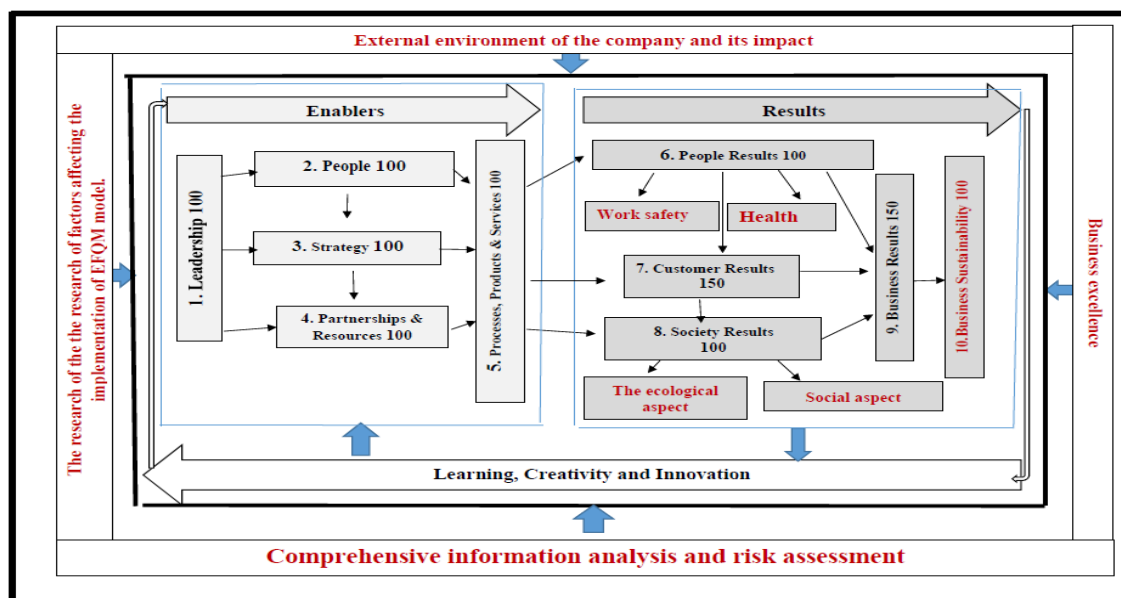


Figure 2: Improved EFQM business excellence model[created by the author according to the experts' survey data collected in 2018 (n=20) and standard ISO 9001:2015]  
 Rating scale 1-10, where one-the criterion is not important for the inclusion in EFQM model, 10 – criterion must be included in EFQM model.



The author believes that the model shall keep the conceptually adopted principle of the existing model regarding the sequence: approach - results, then training and improvements, but the implementation mechanism needs changes, including in the model some particular aspects and a new criterion – “Business sustainability”, which is directly related to business excellence. Before introduction of the EFQM business excellence model, the management of the company must assess the stimulating and impeding factors in order to reduce the possible obstacles to the implementation of the model and encourage the competitiveness by maximizing the influence of the stimulating factors. The aspect of comprehensive information analysis and risk assessment interacts with the implementation of every criterion since the quality of the decision-making depends on analysis (interpretation) and scope of available and necessary information in order to define strengths and weaknesses of the company, change strategy, introduce improvements, reduce possible business risks etc. Dealing with risks and opportunities is the first step to efficient quality management system in order to improve the results and prevent negative impacts. The opportunities can emerge in the situation that is favourable to achieve the expected results, for instance, in circumstances allowing the organization to attract customers, elaborate new products and services, reduce losses and improve the productivity. The activities for taking opportunities may include the consideration of the related risks. The analysis of the external environmental factors of the company envisage taking into account the impact of the external environment in the context of each criterion. For example, in the criterion “Employees”, while planning the human resource management, the company should consider the common trends of the employment market.

### 3. CONSLUSION

- The Fundamental Concepts of Business excellence model are: Creating a Sustainable Future, Adding Value for Customers, Harnessing Creativity & Innovation, Developing Organizational Capability, Leading with Vision, Inspiration & Integrity, Succeeding through the Talent of People, Managing with Agility, Sustaining Outstanding Results.
- Basing on guidelines of EFQM business excellence model, experts’ opinion and changes introduced in the standard ISO 9001:2015, the author has elaborated an improved version of EFQM business excellence model, including the following aspects: “External environment and its impact to the company”; “Comprehensive information analysis and risk assessment”; “Business excellence”; criterion “Business sustainability” with a corresponding sub-criterion “Indexes of impact from projects related to natural, working and social environment”, all of them aimed to achieve higher level of business excellence.
- Author’s hypothesis - “the improvement of the EFQM business excellence model to be applied in the quality assessment process in Latvian companies, including new criteria and integrating them with the conventional criteria of the model, can give the opportunity to increase the business competitiveness and drive it towards higher level of excellence” - is proved by the data approbation of the qualitative research carried out by the author.
- In order to reflect in EFQM business excellence model the topical issues of the contemporary business practice related to companies’ striving for excellence and according to the improvements of the approbated model approved by Latvian and foreign experts, the author suggests to include in the EFQM business model such aspects as “External environment and its impact to the company”, “Comprehensive information analysis and risk assessment”, “Labour safety and healthcare” as well as a particular criterion “Business sustainability”.
- In order to comply in due quality with the guidelines of EFQM business excellence model aimed to achieve short-and long-term goals, which is important for the implementation of company’s strategy and risk identification, the sub-criteria of the criterion “Leadership” should be supplemented by the indication about sustainable development.

- In order to guarantee the successful the company's activities in long term in the constantly changing business environment, the author suggest to amend the sub-criteria of the criteria "Strategy" adding the indication about necessity of sustainable development and risk assessment.
- In order to improve the human resource issues in long term, reduce the amount of incorrect or not precise information, the criterion "Human Resources" should include the following ground sub-criteria with indication on guaranteed equality, sustainable thinking as well as risk reduction in communication with staff.
- To make the company implement its strategy in long term and reduce possible risks related to the insufficient knowledge and information for the decision-making, the sub-criteria of the criterion "Partnerships and resources" are supplemented with the indication about risk reduction possibilities.
- In order to comply precisely with the needs and wishes of all interests stakeholders as well as in order to ensure the company's operations basing on principles of sustainable development, the sub-criteria of the criterion "Products, services, processes" are supplemented with the indication about risk assessment.
- In order to strengthen the positive image of the company in the society the sub-criterion of the criterion "Social results" is supplemented with the indication on *image in the context of sustainability*, making long-term contributions, respectively.
- In order to prove company's readiness to take part in solutions of different environmental issues, which will help to improve its public image, the sub-criterion of the criterion "Social results" is supplemented with the indication regarding the *dealing with environmental problems*.

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## CAN THE COMMON AGRICULTURAL POLICY SUPPORT BUILDING RESILIENT FARMS IN THE EU?

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### **ABSTRACT**

*The challenges facing the agricultural sector in relation to the climate change and the globalisation process are numerous. Farms need to adapt to the new conditions and become more resilient to the risk they encounter. The agricultural policy should respond to this need and offer a set of tools that can strengthen the resilience of the farming sector. The European Commission's proposals for changes in the common agricultural policy (CAP) in the programming period 2021-2027 also include the concept of resilience in agriculture. The paper aims at assessing the proposal for the upcoming reform of the EU common agricultural policy in the context of supporting resilience. It is based on document analysis and literature review related to the proposed changes in the functioning of the CAP. The key issue for the analysis is the capacity of the new CAP to reinforce the resilience of the EU farms and the farming sector as a whole. Moreover, it determines the risks the CAP is to tackle and the ones that do not come into the radar of this policy. The results show that despite making farm resilience one of the priorities for the EU agricultural policy, both the level of funding and the set of proposed policy instruments do not guarantee achieving any real progress in making the EU agriculture more resilient. Besides, different farm types are to be offered different set of support for resilience building which will be conducted at a loss of other farms and thus lead to lack of resilience at the sectoral level. Therefore, the reform of the CAP can become not only a missed opportunity for increasing the competitiveness of the EU farming but also a serious barrier for further development of the EU farms.*

**Keywords:** *common agricultural farms, EU agriculture, resilient farms*

### **1. INTRODUCTION**

Agriculture is subject to numerous challenges and shocks. These include, among others, price shocks, changes in markets, diseases, climate shocks or changes in markets (Walker et al., 2009). Therefore, the issue of resilience of agriculture has been gaining popularity as the climate changes and economic instability become more and more visible and endanger the sustainability of agricultural production. It is evident that adapting food systems to “environmental challenges requires more than just technical solutions to increase agricultural yields” (Eriksen, Ingram and Liverman, 2009, p. 373). Resilience is a complex issue and in the context of agriculture it is analysed at different levels. It can be studied at a level of a single farm, a whole region/country or in the context of the whole food system. The concept of resilience first appeared in 1970s (Walker and Cooper, 2011, p. 143), yet some mention of this issue can be traced back almost 2,000 years from the modern times (Alexander, 2013). Now, it is presented in different ways and thus there is no commonly agreed definition. There is a wide range of approaches towards the characterisation and analysis of resilience. Brand and Jax (2007) underline the fact that there are descriptive approaches to resilience stemming both from ecological science and social ones as well as hybrid approaches and normative ones. Meanwhile, Lamine stated that resilience can be assessed using both sustainable development and relocalisation paradigms (Lamine, 2015, p. 41). Moreover, resilience can be applied in different sciences with various meaning and study focus (fig. 1). Yet, in all of the sciences and context it concentrates on the capacity of a given system to resist external pressures that can destroy it.

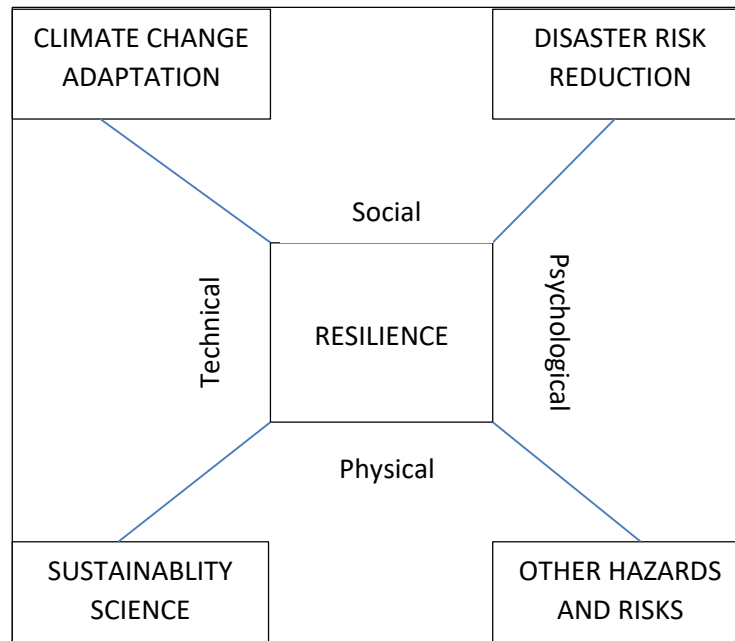


Figure 1: Position of resilience studies in the sciences (Alexander, 2013, fig. 7)

First to describe the theory of resilience in social-ecological systems was Holling (Cabell, Oelofse, 2012). Despite the fact that there progress have been made in the development of this theory, there “does not yet exist a definitive set of resilience enhancing principles or a synthetic understanding of where and when they apply” (Biggs et al., 2012, p. 424). When tackling the issue of resilience two main questions have to be answered before a specific strategy or policy can be designed. These questions are: Resilience to what? Resilience of what? An answer to the first of these questions requires defining a system or a process that should be resilient, while in the case of the second one types of disturbances must be listed. Generally, they include different kinds of stresses and shocks. A following step in tackling the resilience is an assessment of system’s capacity of dealing with the identified disturbances should be conducted. It includes estimating exposure, sensitivity and adaptive capacity. Based on this assessment the reaction of the system to disturbances can be forecasted. There is a whole range of the reactions that could occur. Among them we can name: failure to cope with a disturbance leading to the system’s collapse, worsening the state of the system, bouncing back or improving the system’s state. A holistic analysis of the level of resilience of a given social-ecological systems must include several aspects of the functioning of such a system. They encompass “measures of productivity, value-added, income generation, the effective use of natural resources, social-ecological resilience, the maintenance of ecosystem services, the provision of public goods and, not least, well-being in rural areas and the ability of rural communities to flourish (Jackson, 2009). The aim of this paper is to assess the proposal for the upcoming reform of the EU common agricultural policy in the context of supporting resilience. It is based on document analysis and literature review related to the propose changes in the functioning of the CAP. The key issue for the analysis is the capacity of the new CAP to reinforce the resilience of the EU farms and the farming sector as a whole. Moreover, it determines the risks the CAP is to tackle and the ones that do not come into the radar of this policy. The paper is based on literature and document analysis. The paper consists of two main parts. In the first part the concept of farm resilience is discussed. The second part is devoted to an analysis of the European Commission’s proposal for the CAP 2021-2027 conducted through the lens of farm resilience strengthening.

## 2. CONCEPT OF FARM RESILIENCE

Agricultural sector can be named a socio-ecological system. As all such system it is both complex and adaptive. This means that agriculture consists of both bio-physical and social elements which influence one another through a range of mutual interdependencies. The analysis of literature focusing on future, with a special focus on 2050, shows that the challenges for conducting agricultural activity will continue to grow, especially the ones related to agriculture<sup>1</sup>. As stated by Jacobi et al. (2018), "resilience is often considered a precondition for sustainable social-ecological systems" (p. 433), while Dranhof et al. (2016, p. 113) emphasized the capability of such systems to deal with long phases of incremental changes and period of turbulences when radical transformation is needed. As already stated, the reaction to a disturbance is shed by three characteristics of the given system: exposure, sensitivity, and resilience. Allen and Prosperi (2016, p. 962) stated that "vulnerability V can be regarded as a function of the components' recovery potential (RP) and potential impacts (PI), which in turn are expressed by exposure (E) and sensitivity (S)".

$$V = f(PI, RP), \text{ with } PI = f(E, S)$$

In relation to farming three key perspectives to resilience can be named (tab. 1). First of them concentrates on structures. It can be called a traditional approach as it focuses on typically considered characteristics of farm and its owner, such as size of a farm, type of production or farmer's age and education level. This approach also relates to mainstream economics as it sees the farmer as an independent, rational individual. The second perspective sees farmers as social actors and part of a social system interacting with other actors. The third approach concentrates on relations, which shape the whole system and its actors. There are different categories of activities that can be undertaken to make farms resilient. Ashkenazy et al. (2018, p. 213) proposed following division of these activities:

- Valuing traditions and local capacities;
- Promoting economic diversification;
- Utilising technological innovation and cost efficiency;
- Increasing cohesion between different social groups within the region and outside;
- Optimising the use of public support.

Among these activities trade-off type of relations can occur. Therefore, a set of policy instruments aimed at increasing the resilience of farms needs to take into account potential of supporting measures that contradict one another. Yet, it must be also borne in mind that different types of farms operating in diverse settings require different support in order to strengthen their resilience. When dealing with the first resilient reaction to a disturbance, that is adaptation, agricultural policy should focus on providing information, catalysing the improvement of the social capital and investing in technologies and infrastructure that enable risk mitigation and providing financial resources for farmers so that they have the capacity to improve their technologies and farming processes.

*Table following on the next page*

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<sup>1</sup> A review of such scenarios can be found i.e. in Wieliczko (2019).

*Table 1: Key perspectives of resilience (Darnhofer et al., 2016, tab. 1)*

	Structures - farms	Social actors - farmers	Relations - farming
Analytical focus	Biophysical structure of the farm (e.g. size, type) and of the agro-ecosystem (e.g. soils, nutrient flows); also attention to social structures (e.g. markets, policies) Search for specific attributes of farms and agroecosystems that convey resilience within a given context	Agency of social actors (e.g. farmers, consumers, networks); critical analysis of the effect of power relations Understanding how farmers' perception of change, how learning processes, and how broader social forces influence farm adaptation or transformation	Integration of relations spanning biophysical processes and social forces As relations are continually reshaped (through ecological and social dynamics), resilience emerges from the ability to make and remake relations
Integration of ecological dynamics	Acknowledges complexity from feedbacks in ecological processes, yet in studies often a pragmatic focus on those biophysical entities that are amenable to quantitative modelling	Acknowledges influence of biophysical structures: they constrain, but do not determine action As ecological change is assumed to evolve over the long-term, within a study it is often treated as stable	Farming is a situation-specific web of ecological, technical and social relations Ecological factors (e.g. crops, pests, nutrients, climate) impose constraints and opportunities for how resilience can be enacted
Conceptualisation of actors	Cartesian rational actor; emphasizes instrumentalist means-ends rationality Methodological individualism leads to atomistic decision-maker	Farming as socially constructed; thus focus on subjectivity, values, beliefs, perceptions, meanings, culture linked to farming Farmer as active participant in nested and overlapping social networks	Actors are not pre-existing but constituted through relations Human agency is contingent on the relationships built with - and partly enabled by - material factors
Conceptualisation of relations	Relations between ontologically independent entities Focus on flows of matter (e.g. nutrients) between physical entities	Relations between ontologically independent entities Focus on social relations between social groups, e.g. power, learning	Relations - rather than entities – are ontologically primordial Focus on interactions in space and in time, between humans and nonhumans

An important issue related to resilience building in the case of agriculture is risk management. Growing number of extremal climatic events and increasing temperatures affect the conditions of conducting agricultural activity. A key recommendation for agricultural policy related to risk management is tackling it holistically so that the whole spectrum of risks is taken into account. The long-term resilience of food system requires a careful participatory process of developing a desired vision of it. The capacity to conduct this process requires knowledge of threats and opportunities and thus, a process of participatory and reflective learning must be present. Summing up, it can be stated that resilience in agriculture, as the whole concept of resilience, has different definition. Yet, there are common issues that are underlined in most of these definitions. As an OECD report states, they include the capacity of an agricultural system to absorb the impact of a disturbance, adapt to it or transform itself to cope with the change in the conditions in which agricultural activity is conducted.

### 3. FARM RESELIENCE VS COMMON AGRICULTURAL POLICY

In 2018, the European Commission (EC) published its proposals for the regulations governing the functioning of the CAP in the period 2021-2027. They followed the EC's proposal related to the EU multiannual financial framework for this period (EC, 2018a). With these proposals the EC launched the processes of creating regulations and budget for the EU policies to be

implemented in the period 2021-2027. The European Commission acknowledges the need to support farm resilience. In the explanatory memorandum of the EC's proposal of a regulation for the CAP 2021-2027 it stated that "Europe needs a smart, resilient, sustainable and competitive agricultural sector in order to ensure the production of safe, high-quality, affordable, nutritious and diverse food for its citizens and a strong socio-economic fabric in rural areas" (EC, 2018b, p. 1). The issue of farm resilience has become one of the specific objectives of the CAP 2021-2027 "Support viable farm income and resilience across the EU territory to enhance food security". Moreover, the EC sees the need to strengthening the resilience is an important step to be taken in order to harness the globalisation. EC considers direct payments CAP's key instrument of fostering resilient agriculture. Direct payments are seen as an income stabilisation tool. Therefore, they play a vital role in risk management as the amount of this support is fixed and not related to changes in prices of agricultural products or the volume of production. The EC also emphasized the role of investment in strengthening the resilience of the EU farming sector. Yet, the proposed budget for the CAP does not ensure that the investment volume will be sufficient. This is due to the fact that the proposed by the EC budgetary allocation for the CAP is 15% lower than the current one (tab. 1) comparing the allocation for EU-27. Yet, the burden of the reduction is not equally split between the CAP pillars. The allocation for the European Agricultural Guarantee Fund (EAGF), that is the pillar 1, is to fall only by 11%, while the one for European Agricultural Fund for Rural Development (EAFRD), pillar 2, is planned to decrease by as much as 28%.

*Table 2: Planned allocation for the CAP 2021-2027 (constant prices 2018; EUR million)  
 (Wieliczko, 2019b, tab. 1)*

Specification	1. EU-28 2014-2020	2. EU-27 2014-2020	3. EU-27 2021-2027	Change 3/2 in %
EAGF	309,064	286,143	254,247	-11%
EAFRD	102,004	96,712	70,037	-28%
Total CAP	411,068	382,855	324,284	-15%
Total MFF	1,136,105	1,082,320	1,134,583	5%
CAP's share in MFF	36.1%	35.3%	28.5%	--

An important part of the resilience strengthening support of the CAP are payments for farmers operating in areas with natural constraints (ANC). These farms are most vulnerable to any disturbances in the conditions of conducting agricultural activities. The lower productivity and efficiency of such farms calls for additional support for struggling with the challenges faced. The CAP support is an answer to this. Yet, the scale of support does not ensure a long-term resilience building but only a tool for stabilising current incomes. The proposed set of instruments includes supporting research and experimental production as well as actions for:

- "soil conservation, including the enhancement of soil carbon;
- improvement of the use of and management of water, including water saving and drainage;
- preventing damage caused by adverse climatic events and promoting the use of varieties and management practices adapted to changing climate conditions;
- energy saving and energy efficiency increase;
- ecological packaging;
- animal health and welfare;
- reducing waste production and improving the use and management of by-products and waste;
- improving pest resilience;



- reducing risks and impacts of pesticide use;
- creating and maintaining habitats favourable to biodiversity” (EC, 2018b, art. 60).

Janssen and Osnas mentioned diversity of agents as one of the factors enabling resilience of social-ecological systems (2005, p. 3). This makes it possible that the whole system can cope with a new threat as there can be some agents that can handle the new danger. Therefore, the strive of the CAP “to foster a smart, resilient and diversified agricultural sector ensuring food security” (one of the three general objectives of the CAP 2021-2027), can be named a right step towards resilience. Yet, this polycentricity of governance can also lead to decrease in the overall resilience. This can be the result of lack of capacity of some of the institutions to undertake resilience building measures or concentrate on priorities that do not ensure resilience. The lack of clearly stipulated policy goals that characterises the EC’s proposal means that there is no way to establish transparent criteria against which the member states strategic plans can be evaluated. In fact, this can result in underperformance of the CAP. The other possible scenario is the fictitious empowerment of the member states. In this scenario member states are obliged to prepare their strategic plans but the Commission makes the decision on accepting them dependent on the inclusion in these plans of measures that have been decided by the EC. The ring-fencing of 30% of the EAFRD allocation for environmental measures is by some member states seen as too strong an intrusion in their freedom of shaping their strategic plans that limits their capacity to design a set of tools that are optimal for the identified needs of the agricultural sector in the given area. Yet, on the other hand this is a way of safeguarding the EU objectives related to climate and the role of agriculture in mitigating climate changes. In order to be resilient, agriculture needs policy that is designed and conducted based on adaptive governance principles as highlighted by a number of studies on resilience of SESs (i.e. Anderies et al., 2006). Moreover, an important issue is to support resilience through managing the SESs at different scales with consideration to diversity. The proposed by the EC change in the management of the CAP can be considered a step in this direction. Based on the EC’s proposal the member states will be subject to prepare national strategic plans stipulating how they are going to make use of their CAP allocation. They are also obliged to base their choices of instruments and beneficiaries on evidence of the current situation in agriculture and observed trends in the development of this sector. Economies of scope and diversification are considered a way for increasing resilience of agricultural sector (de Roest et al., 2018). Therefore, the continuation of supporting diversification of the economic activity within the pillar 2 can be assessed as a way of supporting EU farm resilience through the CAP. Yet, the complexity of agricultural system makes it impossible to rely on current resilience model. This makes designing an agricultural policy supporting farm resilience an even more daunting task. Therefore, there is a need for continuous monitoring of agriculture and looking for ways that are in a given context most efficient and effective in supporting farms faced with specific disturbances. The key problem related to the capacity of the CAP to support shaping farm resilience is its limited time frame. Despite the fact that the EC and other EU stakeholders have access to a number of scientific reports on the future changes in agricultural surrounding, the rationale for the CAP reform does not put enough emphasis on these prognoses when advocating policy measures. This leads to lack of understanding among CAP stakeholders why the EC insists on a high rate of the CAP budget allocation for environmental measures.

#### 4. CONCLUSION

As agriculture is a social-ecological system it cannot be seen through a lens of equilibrium or stability. The growing uncertainty related to both climate and economic changes makes the agriculture more and more vulnerable. Therefore, to continue ensure food security agricultural policy needs to support the resilience of farming sector.

An important issue that should be borne in mind is the fact that resilience requires incurring costs. Numerous measures that could be implemented are too costly to justify their application at this moment. Yet, it must be carefully analysed whether the postponement of a given investment project is a right decision in a long-term. The complexity of the agricultural system and a growing difficulty in building a policy consensus when it comes to spending public money are yet another difficulty in finding an optimal solution to the resilience dilemma. The EC tries to emphasize the long-term challenges in its climatic policy. Yet, in the case of CAP it is still too shy to fully underline the need to make the farming accountable for the greenhouse gas emissions it generates. This can be seen as a proof that the CAP is not focussed on long-term resilience of the European agriculture but only on short-term fixes that should ensure keeping the farming sector viable during the coming several years. This approach will surely exacerbate resilience problems and make the tasks for the next CAP reform even more challenging. It seems that the key issue related to farm resilience is risk management. The CAP does not offer a common, holistic risk management policy. Yet, it must be borne in mind that the CAP is only part of the policy targeting agriculture. Not less important is the agricultural policy at the national level. It is still the member state level where vital risk management tools are offered, including subsidised insurance premiums. Yet, the CAP can do much in making the awareness of the importance of risk management in increasing the resilience more common. The information policy and the vocational trainings can help in popularization of the risk management strategies. Moreover, there is an inherent trade-off between short-term benefits and long-term resilience. Therefore, the design of resilience strategies must take into account the possible contradictories in resilience building related to different spatial and temporal scales. While assessing the capacity of the planned CAP reform to strengthen the farm resilience to different kinds of disturbances it must be evaluated whether the CAP is to offer new solutions to resilience challenges. The proposed set of policy instruments does not differ significantly from the current one. Moreover, the lowered budgetary allocation will translate to smaller scope of the support targeted to farms. Therefore, it cannot be stated that the new CAP will have higher capacity for supporting resilience than the current one. It can only be said that the EC's proposal in the rationale for the reform showed the awareness of resilience challenges faced by the EU agriculture. In conclusion, the only potential increase in the CAP's capacity to support resilience lies in the proposed rise in the scope of responsibility of member states in designing the set of the CAP instruments in operation on their respective territory. Yet, the question remains whether the member states know how to make effective and efficient use of the new powers and whether the European Commission has the tools to control the minimum standards that could ensure member states approach to farm resilience tackles the issue in a holistic way. Thus, we have to wait for the outcomes of the negotiations between the EC and EU member states to fully assess whether the new management model serves the farm resilience well.

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## PERCEPTION OF THE NON-COMMERCIAL ADVERTISING OF GENERATION Z FROM SLOVAKIA

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### ABSTRACT

*Advertising, as a dominant tool for marketing communication, has become a phenomenon inherently interfering in culture and society. Its influence significantly affects the immediate surroundings. Non-commercial advertising that tends to participate in bringing positive value to society has a unique position. In its essence and focus, it presents social problems in such a way that the recipient becomes aware of them and begins to think about them. For target groups it, therefore, evokes a certain amount of prevention of possible negative social influences, their manifestations on an individual as well as on the world in which he or she lives. Based on this, non-commercial advertising can contribute to appealing to social problems and encourage public engagement in solving them. The paper deals with the perception of the term "non-commercial advertising" - in the segment of generation Z in Slovakia, represented by university students. The research method of data collection was an online questionnaire with the implementation of semantic differential. The data processing was conducted by means of descriptive and inferential statistics. The resulting findings refer to the perception of the term, "non-commercial advertising" by a research group of adolescents in their semantic space.*

**Keywords:** *Non-commercial advertising, Advertising, Generation Z, Adolescents, Perception, Questionnaire, Semantic differential*

### 1. INTRODUCTION

Advertising, as a dominant tool for marketing communication, has become a phenomenon inherently interfering with culture and society. The Advertising Standards Council (ASC) in the Slovak Republic defines advertising as "A communication process carried out for reward or some other equivalent. The purpose of this communication process is to in, anyway, influence the behavior of the consumer, in particular to provide the consumer with information about a competitor's product, activity or objectives, as well as about his or her charitable or other non-commercial nature" (The Advertising Council, 2015). Its influence significantly affects the immediate surroundings. Non-commercial advertising that tends to participate in bringing positive value to society has a unique position. In its essence and focus, it presents social problems in such a way that the recipient becomes aware of them and begins to think about them. For target groups it, therefore, evokes a certain amount of prevention of possible negative social influences, their manifestations on an individual as well as on the world in which he or she lives. Based on this, non-commercial advertising can contribute to appealing to social problems and encourage public engagement in solving them (Bulanda, 2017a).

### 2. NON-COMMERCIAL ADVERTISING

Non-commercial advertising is a convincing process meant to influence the behavior of people, which does not relate to material values, even though the same methods are used in advertising

products and services (Hajn, 2002). We can also say that non-commercial advertising is an action that is communicative and purposeful, focused on a specific target group and helps in the formation and change of opinions, attitudes and habits (Hradiská, 1998). Non-commercial advertising can also be characterized as communication between the sponsor and a potential customer with a commercial purpose, using the media (Vysekalová, Mikeš, 2007). The substantial part of non-commercial advertising can be realized through the use of media communication (Lincényi, 2017). The realization and creation of programs designed to attract changes in the social field by using techniques that are also used in the commercial field of advertising, differentiate in the content and goals (Parkerová, Stehlík, 2004; Fabuš, Lincényi, Otrubčák, 2011; Světlík, 2018). Non-commercial advertising tries to highlight the general problems of the world, tries to influence people's behavior, draws attention to bad habits, and motivates people to positive acts and changes. It often requires people to think about themselves and take a certain attitude toward a specific social issue. Harantova (2014, p. 124) defines non-commercial advertising as: the result of publicly performed activities defined by the sponsor through media with a focus on the target group of the population as a whole or on certain segments, the purpose of which is to get attention to improve life by transforming undesirable behavior and minimizing its negative consequences and / or maximizing desirable positive attitudes and subsequent proactive negotiation." Proactive behavior and negotiation is understood as the one that accepts social responsibility. Non-commercial advertising is according to Světlík (2016) a tool to awaken and strengthen the sense of co-responsibility for disadvantaged groups in society, to motivate them to participate in solving their problems and to provide help. The goal of non-commercial advertising is to change the world for the better through emotions, perceptions and consciousness (Hubinková, 2008). Non-commercial advertising follows the acceptance of a certain thought, idea or pattern of behavior, which should then function as the one that we will then use to point out social topics (Gajdušková, 2005). Through a selected media, we can acquaint the public with the social issue, or we can try to suggest possibilities for solving the problem, but we can also help the public to become involved in solving the problem. The goal of non-commercial advertising is an effort to bring public benefit and ultimately the long-term improvement of the socio-economic situation (Kotler, Lee, 2015). The following can be included among the more detailed specification of the general objectives:

- to raise awareness of the needs and problems in our society
- to communicate about new, sensitive or taboo topics
- to solve problems with acquired resources
- to raise awareness about non-profit organizations
- to indicate, in certain phenomenon, their possible harmful consequences

The mission of non-commercial advertising can be to humanize society, create moral values with a subsequent change in the behavior of individuals in society in accordance with these values. The significance of non-commercial advertising is to define a given social problem and to convince society itself to participate in its solution. A common denominator in multiple definitions of non-commercial advertising, its objectives and functions is to reflect the general attributes of non-commercial advertising as communication and therefore the interaction process between the advertiser and the target group, meeting the primary objective of attracting an individual's attention to the problems existing in society, providing an educational framework in the area of a given social problem and thereby influencing behavior and changes in the attitudes of the target group. With regards to this this anchoring content, in our opinion, non-commercial advertising thus becomes a means of forming relations to the surrounding reality, a way of eliminating societal carelessness, or apathy, and drawing attention to social problems (Bulanda, 2017a).

### 3. THEMATIC AREAS OF NON-COMMERCIAL ADVERTISING

Non-commercial advertising is one of the means of forming relationships with the surrounding reality, by eliminating the indifference or apathy of society and by bringing attention to social problems. In terms of marketing communication non-commercial advertising is determined as a specific sector of advertising. Through non-commercial advertising, topics that reflect societal issues at a certain time are discussed, making the content level of non-commercial advertising broad (Harantová, 2014; Koprda, 2016; Bulanda, 2017b). Social campaigns process a wide range of topics, depending on the part of the world where the ad is presented, from a particular society and from its current social problems, but also from the media through which it will be distributed, which means that the topics of social campaigns in developed countries will most likely differ from those presented in developing countries (Džupina, Džupinová, 2016; Janková, 2016; Jeleňová-Gecelovská, 2009 In Bulanda and others, 2017b, Bačíková, 2017). To clarify the subject of what topics non-commercial advertising deals with, we specify an overview of social themes which have occurred in social campaigns (Kotler, Roberto, Lee, 2002, p. 4):

- Health protection – this area includes campaigns against smoking, alcohol consumption, prevention of prostate, breast, skin cancer, breastfeeding promotion, prevention of sexually transmitted diseases and likewise;
- Safety and prevention - in this sphere we can encounter for example campaigns oriented against alcohol drinking before driving a vehicle as well as emphasizing the importance of using seat belts, child seats, domestic violence, sexual violence prevention, or information on how to deal with fire, accidents and injuries;
- Environmental protection – this category contains campaigns trying to promote waste reduction, trash recycling and sorting, as well as campaigns fighting environmental pollution by industrial firms and cars, or against the construction of motorways and industrial zones, as well as campaigns to protect water resources and the like;
- Social engagement - this area includes campaigns related to blood and organ giving, participation in elections and referenda, volunteering, humanitarian aid in disasters, tax evasion, and so on.

Non-commercial advertising as a marketing communication tool encourages, through appeals in its thematic area content, to communicate rational, emotional and moral values to target groups (Bulanda, 2017a). The success of non-commercial advertising is based on the recipients' confidence. As stated by Gajdůšková (2005), the "reward" that the recipient puts into non-commercial advertising is the awareness that the given problem exists and its solution is very important, or that they financially, or by other means, helped to solve the problem.

### 4. METHODOLOGY

The study presents partial results of a large-scale research project focused on the perception of non-commercial and commercial advertising in relation to own SELF in Slovak customer segments. Perception research that pertains to the perception of the term non-commercial advertising and the term SELF is not well developed in our conditions at present. In the field of marketing communication, the research focuses on the perception of commercial advertising in the spectrum of individual customer segments (Šramová, 2015a; Horňák, 2017; Kádeková and others, 2018). In general, perception is a term that refers to the collection of information in the form of stimuli from the environment through the senses and their transformation through the relevant parts of the central nervous system to the upper psyche (especially consciousness and subconsciousness). An important aspect of the psychology of marketing communication is the so-called sensory perception and its components (visual perception, auditory perception, olfactory perception, taste perception, tactile perception) (Nagy and others, 2014). Every perception is complemented by subjective factors; perception is a process associated with past

experience. It is a complex process involving attitudes, interests, values, etc. (Jurášková and others, 2012). In the context of social advertising, this means that the individual creates an inner psychological picture of the message that is contained in the non-commercial advertising. On this route, non-commercial advertising first passes through the process of sensory perception and consequently cognitive perception. The main objective of the presented study was to identify the subjective perception of the concept of non-commercial advertising in relation to the concept of SELF in the Generation Z segment in Slovakia. In order to set the main goal, we have formulated the following research questions (RQ):

- RQ1: What is the perception of SELF (part of the self-capturing) in the research file of the customer segment of the Z generation?
- RQ2: What is the perception of concept of non-commercial advertising by the research file of the customer segment of the Z generation?

In the research we have formulated the following hypothesis:

- H: We assume that there is a correlation between the perception of the term SELF and the perception of the notion of non-commercial advertising in the research file of the customer segment of the Generation Z.

The research file represented the Generation Z customer segment in a cohort of 17-21 years. Although there is no exact age limit for this generation, we have inclined to the Madden (2017) definition, that the Generation Z includes individuals (people) born between 1995 and 2009. It is a generation of environmental-conscious, socially responsible who is involved in social issues (Šramová, 2015b; Hodinková, 2016). The research group consisted of 298 respondents, 240 women (81%) and 58 men (19%). The average age of the entire study population was 20 years ( $SD = 0.799$ ). The average age of women was 19.97 years ( $SD = 0.80$ ). The average age of men was 20.06 years ( $SD = 0.79$ ). The table below (Table 1) shows that the research population was largely composed of female respondents. The disproportionality of the research population in terms of gender representation can be explained by the fact that it could be influenced by a determinant related to the current demographic structure of the population, which is dominated by women (Statistical Office, 2019). Despite this, we can conclude that the research set corresponds to the specified intentional selection criterion with respect to the segmentation approach of the generational typology and represents the Generation Z customer segment in Slovakia in the defined age cohort.

GENDER (Age cohort 17-21)			
	Women	Men	Total
Valid (N)	240	58	298
Percent	81%	19%	100%
Mean	19,97	20,06	20,00
Standard Deviation	0,80	0,79	0,799

*Table 1: Evaluation of respondents by gender (Own research)*

In the research we applied methods that were related to data collection and their evaluation. The primary method of data collection was the exploratory method of the questionnaire implying the semantic differential method. The questionnaire was in the written form in which respondents were able to record their assessments relating to SELF and non-commercial advertising concepts. The author of the applied secondary method of semantic differential is Osgood, Suci and Tannenbaum (Džupina and others, 2013). Originally the introduced method was developed to measure the connotative meaning of terms, and later its use was extended in the humanities and social sciences to explore social perception, mental and social

representations. Nowadays, this method has also been used in the field of marketing research, and is used in market research, public opinion surveys. Its modified applications for measuring attitudes and frequent use of evaluation scales in marketing research are also being expanded. The semantic differential consisted of 36 seven-point scales in the presented research. Individual scales consisted of bipolar pairs of adjectives, which were focused on three basic dimensions of semantic differential, also referred to as EPA - evaluation, potency and activity. In the research we used the following adjectives: 1. good - bad, 2. important - insignificant, 3. understanding - moralizing, 4. tolerant - intolerant, 5. exclusive - ordinary, 6. rich - poor, 7. contemplative - shallow, 8. public - private, 9. sincere - false, 10. friendly - unfriendly, 11. tractable - intractable, 12. natural - artificial, 13. sure - uncertain, 14. honest - unprincipled, 15. reliable - doubtful, 16. liberal - authoritative, 17. engaging - boring, 18. strong - weak, 19. simple - complex, 20. organized - chaotic, 21. gentle - rough, 22. naive - calculating, 23. tranquil - excited, 24. loud - quiet, 25. trustworthy - misleading, 26. protecting – non-protective, 27. devoted - egoistic, 28. socially beneficial - socially unworthy, 29. practical - impractical, 30. commercial - non-commercial, 31. pedant - negligent, 32. needed - useless, 33. active - passive, 34. direct - manipulative, 35. bold - shy, 36. poisonous - acceptable. To evaluate the data, we obtained through the questionnaire, we used the descriptive statistics method and the Pearson test using SPSS.

## **5. RESULTS AND DISCUSSION**

The results of the research findings in the following tables and graphs reflect the individual stages of statistical processing of data obtained from a questionnaire implying a semantic differential method. In the first phase, profiles of evaluated concepts were processed using descriptive statistics – SELF (Table 2) and non-commercial advertising (Table 3).

*Table following on the next page*



Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
SELF1	298	1	7	2,07	,914
SELF2	298	1	7	2,70	1,089
SELF3	298	1	5	1,86	,871
SELF4	298	1	7	2,12	1,011
SELF5	298	1	7	3,79	1,428
SELF6	298	1	7	3,72	,978
SELF7	298	1	7	3,10	1,168
SELF8	298	1	7	4,07	1,562
SELF9	298	1	5	1,85	,811
SELF10	298	1	5	1,71	,894
SELF11	298	1	7	2,35	1,031
SELF12	298	1	6	1,96	,936
SELF13	298	1	7	3,20	1,428
SELF14	298	1	7	1,94	,918
SELF15	298	1	7	1,91	,967
SELF16	298	1	7	3,52	1,391
SELF17	298	1	7	3,14	1,139
SELF18	298	1	7	2,64	1,196
SELF19	298	1	7	4,00	1,801
SELF20	298	1	7	2,65	1,375
SELF21	298	1	7	2,93	1,406
SELF22	298	1	7	3,66	1,389
SELF23	298	1	7	3,30	1,523
SELF24	298	1	7	3,52	1,644
SELF25	298	1	7	1,98	1,005
SELF26	298	1	6	2,03	1,028
SELF27	298	1	7	2,29	1,214
SELF28	298	1	7	2,94	1,171
SELF29	298	1	6	2,49	1,016
SELF30	298	1	7	3,88	1,189
SELF31	298	1	7	2,74	1,275
SELF32	298	1	7	2,71	1,135
SELF33	298	1	7	2,47	1,152
SELF34	298	1	7	2,38	1,269
SELF35	298	1	7	3,04	1,525
SELF36	298	1	7	4,85	1,488
Valid N (listwise)	298				

Table 2: Average Perception Profiles SELF (own research)

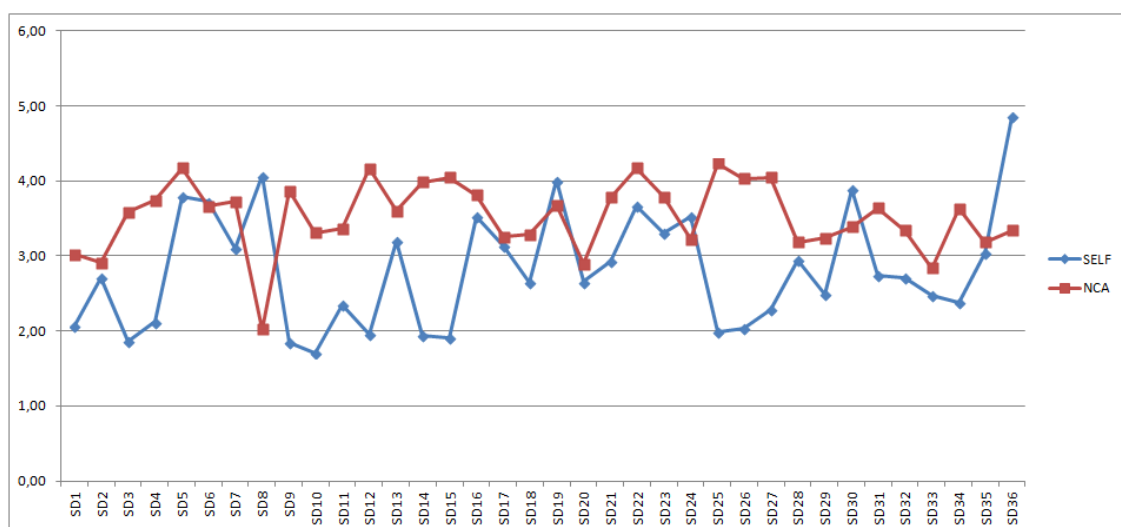
Table following on the next page

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
NCA1	298	1	7	3,02	1,301
NCA2	298	1	7	2,91	1,359
NCA3	298	1	7	3,58	1,441
NCA4	298	1	7	3,74	1,389
NCA5	298	1	7	4,17	1,543
NCA6	298	1	7	3,66	1,237
NCA7	298	1	7	3,72	1,402
NCA8	298	1	7	2,02	1,339
NCA9	298	1	7	3,87	1,714
NCA10	298	1	7	3,31	1,395
NCA11	298	1	7	3,36	1,396
NCA12	298	1	7	4,16	1,641
NCA13	298	1	7	3,60	1,373
NCA14	298	1	7	3,99	1,479
NCA15	298	1	7	4,05	1,614
NCA16	298	1	7	3,81	1,214
NCA17	298	1	7	3,26	1,692
NCA18	298	1	7	3,29	1,499
NCA19	298	1	7	3,67	1,467
NCA20	298	1	7	2,90	1,490
NCA21	298	1	7	3,78	1,193
NCA22	298	1	7	4,17	1,489
NCA23	298	1	7	3,79	1,306
NCA24	298	1	7	3,22	1,402
NCA25	298	1	7	4,23	1,693
NCA26	298	1	7	4,03	1,607
NCA27	298	1	7	4,05	1,512
NCA28	298	1	7	3,18	1,648
NCA29	298	1	7	3,23	1,488
NCA30	298	1	7	3,39	1,893
NCA31	298	1	7	3,64	1,158
NCA32	298	1	7	3,34	1,656
NCA33	298	1	7	2,84	1,327
NCA34	298	1	7	3,63	1,829
NCA35	298	1	7	3,18	1,405
NCA36	298	1	7	3,34	1,901
Valid N (listwise)	298				

*Table 3: Average non-commercial advertising perception profiles (own research)*

The results show that the Z generation file of research perceives the term SELF in dominating positive connotations. The term SELF is perceived as: good, understanding, honest, friendly, natural, honest and reliable (Table 2). Due to the above, it can be stated that, in general, the concept of SELF includes objective and subjective properties. In the first meaning of SELF as an object, an individual defines its own physical, age, and social attributes. The second definition of SELF as a subject includes a wide range of self-assessing aspects, self-assessment, feelings of uniqueness, stability, self-esteem, and so on. From the point of view of the ontogenesis periodization, the Z-generation research group in the age group 17-21 can be included in the adolescence period. This period is characterized by the consolidation of mental life, the crystallization of attitudes, opinions, rational and mental maturation.

It leads to the development of individual thinking, feeling, acting, i.e. biological, psychological and social changes (Orel and others, 2016). The resulting findings point out that the perceptions of SELF concept the above mentioned tendencies are projected into the self-image, based on self-esteem (adjectives: good, sincere, natural), adequacy (adjective: honest), competence (adjective: reliable) and utility (adjectives: understanding, friendly) in their social environment. Positive inclination to adjectives (good, understanding, sincere, friendly, natural, honest and reliable) to some extent suggests the formation and subsequent pursuit of recognition of adult status, the desire to be recognized as equivalent. This is pointed out by Končková (2010, p. 97), who states that the most significant changes in adolescence take place in the psyche: "when an individual reaches the adult level in cognitive development but still lacks the necessary experience." The results can be used to reflect the elimination of the view of the concept SELF, and hence of itself as an immature individual. The average perception of non-commercial advertising is largely centred around mean values (Table 3). Adjacent to positive connotations has been reported in adjectives: understanding, public, organized, active. Concentrating the assessment at the centre of the evaluation scale could be an indicator that Generation Z does not distinguish between commercial and non-commercial advertising (Šramová, 2017). By comparing the average perception profiles of SELF and the non-commercial advertising of the Z generation research file, we found that the highest match rate was concentrated in adjectives pairs (Chart 1): SD2: important - meaningless, SD6: reach - poor, SD16: liberal - authoritative, SD17: engaging - boring, SD20: organized - chaotic, SD24: loud - quiet, SD28: socially beneficial - socially unbeneficial, SD35: bold - shy.



*Chart 1: Differences in Semantic Differential Scale in SELF Perception and Non-Commercial Advertising (own research)*

Comparing the average perception profiles of SELF and non-commercial advertising in the research file of the Z generation, we found that the greatest difference was concentrated in adjectives pairs (Chart 1): SD3: understanding - moralizing, SD8: public - private, SD10: friendly - unfriendly, SD12: natural - artificial, SD14: honest - unprincipled, SD15: reliable - doubtful, SD25: trustworthy - misleading and SD27: devoted - egoistic. The results of the comparison of average profiles (Chart 1) show that the perception of the concept non-commercial advertising is in more negative connotations than the term SELF. We believe that this finding reflects the fact that, generally, advertising as a phenomenon is rather negative. The subject of criticism is the content and formal elements of individual advertising statements, the

manipulation of people, the creation and stimulation of false needs and values supporting materialism, the maintenance of stereotypes, the promotion of commercialism, intrusiveness, etc. These aspects are largely related to commercial advertising, which can be acknowledged that, in view of its business objective, it is guided by a certain representative strategy of displaying pleasant and happy experiences with the product or service (Zelinský, 2014; Vavrečka, Mezulánik, 2016). In the context of non-commercial advertising, a negative can be seen in people's mistrust. This fact arises from past negative experiences with non-commercial advertising, e.g. application of the so-called shock advertising. In some cases, funds collected through social ad campaigns have not been used to the advance intention. We used Pearson's correlation to determine the relationship between Self-perception and non-commercial advertising in Generation Z's research file. Through it, we determined the tightness of the linear dependence between the variables. The correlation coefficient can take values from  $<-1.1>$ . The correlation values in the individual items were within the specified interval (e.g. SELF32–NOCA4:  $r=0,120$ , SELF32–NOCA5:  $r=0,123$ , SELF32–NOCA6:  $r=0,130$ , SELF32–NOCA13:  $r=0,177$ ). This means that there is interdependence between the concepts of SELF and non-commercial advertising, which confirms our hypothesis.

## 6. CONSLUSION

The current form of modern marketing emphasizes the strategic importance of marketing communication and its tools, including non-commercial advertising. Non-commercial advertising has many forms and uses, so it is difficult to generalize its qualities that participate in co-creating a communication mix in social marketing. Non-commercial advertising uses the same symbols, signs and meanings, i.e. expressive means by which the central information (its content) is conveyed from the sender to the recipient, as well as commercial advertising. Despite the considerable differences between the two forms of advertising, they may use similar mechanisms of communication and persuasion. The role of non-commercial advertising is to fulfil a certain social goal, while appealing to socially relevant issues resonating in a given society. Non-commercial advertising is closely linked to the needs of people, their perception, emotions and moral values. The results of our research suggest that there is a dependence between the perception of the concept SELF and the perception of the concept non-commercial advertising.

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# STRATEGIC ANALYSIS OF THE ROAD FREIGHT TRANSPORTERS IN THE REPUBLIC OF CROATIA

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## **ABSTRACT**

*Road freight industry represents the most important branch in most countries regarding land transport of goods, and Croatia is no exception. Road freight transport industry connects production and final consumers, being therefore an important part of the economic system. The purpose of this paper is to strategically analyse road freight transporting firms in the Republic of Croatia based on the analysis of the secondary data. In order to achieve the goal, theoretical postulates of Porter's Five Forces Model were used, so, in line with that, every force is analysed individually in the observed industry. Small transporting firms with the vehicle park of up to 5 vehicles dominate this market, indicating that it is a highly fragmented industry. The barriers for entering this market are minimal, therefore it features many participants neither of which having a possibility of influencing the price policy or the strategy of the future development of this industry. The main drawback of the road freight transport is the negative influence on the environment, so its major competitors are railroad and multimodal transport.*

**Keywords:** *road freight transporters, fragmentation, Porter's model, Croatia*

## **1. INTRODUCTION**

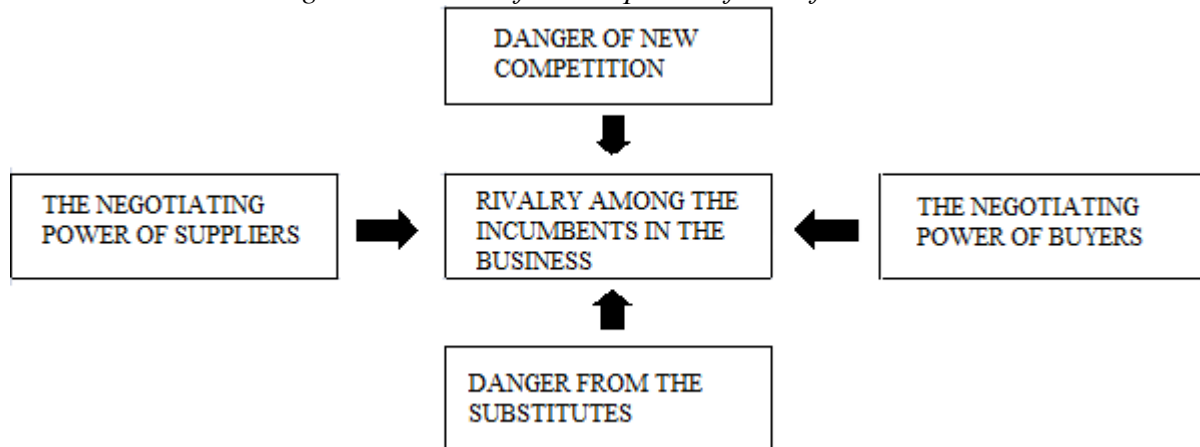
The evaluation of the competitive position and the successfulness of a company are primarily based on the analysis of the industry where the company is active (Butigan, 2008). Competitive strategy has to arise from a sophisticated understanding of the rules of competition that define the appeal of an industry; and its final goal is to deal with the rules, i.e., ideally, change them to benefit the company (Porter, 2007). Road transport has the leading role in the entire transport by land in many countries. In the countries of the European Union, the transport of goods by land is of utmost importance in almost all economic activities. Those activities are focused towards infrastructural and socio-economic welfare in particular. A well-planned infrastructure of roads is one of the key prerequisites of economic growth because all economies depend on the development of road transport (Ivanova and Masarova, 2013: 263). It is so because road connects production and final consumers. The goal of this paper is to conduct an analysis of road freight transporters in the Republic of Croatia. The paper will conduct the analysis of industrial competitive rivalry, the threat of substitution analysis, threat of new entry analysis and the analysis of negotiating power of the suppliers and the buyers, based on theoretical postulates of Porter's five competitive forces model. Secondary data from scientific and professional journals and books from domestic and international literature have been used and will be processed with the methods of analysis, synthesis, induction and deduction and compilation.

## **2. PORTER'S FIVE COMPETITIVE FORCES FRAMEWORK**

For the purpose of this paper, a strategic analysis has been conducted according to the Porter's five competitive forces model. Porter (1980) says that the purpose is to find the position in the field of business which a firm can use to defend itself partly from the competition and partly to influence them in order to gain profit. Resources are not inherently valuable; their value depends on how well they fit in the industrial structure and how well they support a specific strategy (Rivard, Raymond and Verreault, 2006). The application of this model ensures a systematic way of thinking on how competitive forces influence the development of an industry

and how they define the level of profitability of different industries and industrial segments. Also, it gives the framework for considering possible strategic spaces of companies and their profitability (Tipurić, 1999).

*Figure 1: Porter's five competitive forces framework*



*Source: compiled based on the data from Porter, M., E. (1980). Competitive Strategy: Techniques for Analysing Industries and Competitors, New York: Free Press.*

Competitiveness in a business depends on five basic strengths (Porter, 1998):

1. strength of competitiveness among the firms that operate within the industry – rivalry among the existing competitors,
2. existence of firms ready to enter the market if the profitability of the industry is big enough – threat of new entry,
3. customers choosing substitute products if they gain their preference – threat of substitution,
4. buyer negotiating power and
5. supplier negotiating power.

Out of the five competitive forces listed above, three are horizontal: threat of new entry, threat of substitution and rivalry among the existing competitors, while the other two (buyer negotiating power and supplier negotiating power) are vertical. It is important to note that the strength of each is determined with numerous structural variables and that their mutual operations determine the profitability potential of an industry (Porter, 1998).

### **3. PORTER'S 5 COMPETITIVE FORCES FRAMEWORK IN ROAD FREIGHT INDUSTRY IN THE REPUBLIC OF CROATIA**

#### **3.1. The analysis of industrial rivalry**

If competitors feel that their current position is endangered or they wish to improve the existing position, then we speak of rivalry (Christensen et al., 1982). In most industries, companies are interdependent considering that a move made by one company normally has effects on other companies in the industry. The strength of rivalry in an industry is a function of at least three factors: competitive structure, characteristics of demand and the exit barriers (Tipurić, 1996). Competitive structure is defined by the number of competitors and their relative sizes and is mostly measured with the level of concentration, and it can range from very fragmented to a strongly consolidated industry. If an industry is characterized by a large number of companies and none of them have a significant market share, then we speak of fragmented industries. Fragmentation prefers low entrance and exit barriers, weak attitude of the industry towards the buyers and suppliers, poor use of the economies of scope etc. Every firm in such an industry supplies the market with a small share of the total industrial output.



On the other hand, a consolidated industry is a form of concentrated industry where one firm dominates or there is a small number of large firms, and the main characteristic of this type of an industrial structure is a heavy interdependence of the firms that is evident in the fact that actions of the ones influence the profitability of the others and their market shares. The more concentrated industry, the better probability that the firms within the industry will recognize their interdependence and that they will not encourage strong rivalry that can reduce competitiveness of them all (Tipurić, Kolaković and Dumičić, 2003). If the demand for the products or the services of the specific industry declines, then we can talk about the growth of the industrial rivalry. Bearing in mind that the road freight industry in Croatia is heavily fragmented, it can be concluded that there is no firm present on the market that could significantly influence the prices or the strategies for further development and that there is a high concentration of small transporting firms of equal negotiating power. The same situation is distinctive of Western Europe where the road freight industry has more than 300,000 carriers. They range in size from very large companies to small firms and the share of the market value of the biggest firm, DB Schenker, is just about 2.1%. It is often the case that market fragmentation entices firms to work together, gain economies of scale and offer customers better value propositions. Unfortunately, there is distrust among the companies so they fail to collaborate and do not achieve the desired profit. The price, which companies compete fiercely on, is driven by the supply of and demand for freight capacity, with customers having only limited insight into rates, capacity, quality and reliability of the carriers (Riedl et al., 24 April 2018). There are small, medium and large providers of road transport services on the European market. Around two thirds of revenues come from the companies with less than 50 employees, while companies with over 250 employees account for around 10% of the revenues. Smaller companies are a physical asset resource that large network transport providers draw on, given their asset light operating strategies (Research and Market, 29 November 2018). Ncube, Roberts and Vilakazi (2015) point out that in cases where a market is highly competitive, i.e. when it is characterized with a large number of small transporting carriers, conducting business is very hard. This is explained with the fact that small transporters (up to 5 vehicles) will do anything to close the deal and will therefore very often operate with minimal profit. Large transporters generally have privileges when buying fuel regarding the size of the vehicle park, and they also attract good drivers more easily, while small firms can compete with them with their flexibility, i.e. with quick reactions to the market changes and with directing their activities towards the local market or the transport of specific goods (Londoño-Kent, 2009).

### **3.2. Threat of substitutes**

In a broader sense, rivalry means that all companies in an industry compete with the companies from the industries that offer substitutes (Porter, 1998). We speak of threat of substitute when competitors offer different services, but they satisfy the same or similar demands. In case of road freight transporting firms, it is not the services that are substituted, but rather the modes of transport the services are performed with. Therefore, railroad and multimodal transport represent substitutes for road transport (Romanow and Stajniak, 2008). Road transport competes with other types of transport, but to what extent they represent their substitutes, depends on a large number of factors: the type of transported goods, the length of the travel, delivery time etc. (Sriraman et al., 2006). Many countries will start shifting a part of the goods from road to railway, especially when there are longer routes in question in order to reduce fuel costs and CO<sub>2</sub> emission (Daalhuisen, 2013). Affuso, Masson and Newbery (2003) state that the benefits from investing in roads are generally far greater than those from investing in railroad. In Europe, intermodal transport of goods represents strong competition to road freight transport since its environmental influence is considerably less negative (Janic, 2007; Kreutzberger et al., 2003).

However, flexibility, speed and the possibility of “door to door” delivery make road transport undefeatable at distances shorter than 300 kilometres. Advancement of technology, innovations and better logistics can make road transport more effective and suitable means for shorter distances transport in the future (European Commission, 2012). It is indisputable that road freight transport represents the most important transport branch, the advantages being: lower prices for shorter and medium routes than those of railroad and air transport (especially for perishable goods and goods of higher individual value), there is more competition because of many private transport providers, there are also special types of vehicles for the transport of specific goods and the delivery is faster due to the complex and elaborate traffic network, and there is no need for reloading of the goods into other transport vehicles as is the case with other types of transport (Hlača, Rudić and Kolarić, 2015). Čavrak (2003) states the reason for road transport dominating other types of transport is also the reliability, a comprehensive monitoring of the transport, relations with the buyer and speed of delivery. Because of frequent delays and thefts in railroad transport, the users more often choose road transport despite the higher prices (Londoño-Kent, 2009). Road transport is faster and more flexible than rail freight transport, so the cost of fuel becomes relatively negligible, and the reason for that is that road infrastructure is more open and spread throughout (Schipper and Fulton, 2003). Instead of advocating more use of the intermodal transport, one should strive for transporting goods in longer road freight vehicles (Transport en Logistiek Nederland, 1999). Railroad or waterway road transport could undermine the dominance of road transport for hinterland because of costs, congestion and growing environmental constraints. Commercial policy of combined transport operators plays a key role for explaining the competitiveness in terms of price, which varies greatly according to the way road transport is organized. Factors that could encourage the shift from road transport to combined transport are additional services such as additional dwelling times and specific custom advantages (Frémont and Franc, 2010). The weaknesses of road transport in relation to rail and water way transport are: a relatively more fuel consumption per unit of transported goods and more dependency on the weather and other conditions, higher prices of transport at longer distances and finally, more environmental pollution (Hlača, Rudić i Kolarić, 2015). In almost all the service categories road transport offers there is the alternative of rail freight transport. This is especially true if longer routes are in question, where the advantage of taking rail road is in lower prices (Sriraman et al., 2006). It is very likely that intermodal railroad transport is the most realistic alternative for reducing the dominance of road transport and this variant could also make the transport system more sustainable (Zgonc, Tekavcic and Jaksic, 2019).

### **3.3. The danger of competition**

Road freight industry is characterized by relatively low barriers for entering the market regarding launching a transporting organization, so there are often situations when firms that exit the market in time of crisis re-enter the market after the recovery of the economy or they are replaced by other firms (European Commission, 2014). Porter (1990) points out that an industry's profitability is lower if the industry has a changing and undefined competitive structure, weaker position towards the suppliers, the buyers and the substitutes, and if there is serious danger of other firms entering the field. Exactly this danger of new competitors entering the industry is the characteristic of road freight transport. This industry is characterized by express capacity and low barriers to entry (Whyte, 1993). 54% of EU road freight firms have just one employee and 37% have two to nine employees. This means that over 90% of EU road freight businesses have less than 10 employees (Reasearch and Market, 29 November 2018). It can be concluded that smaller trucking companies make up most of the market. Entrance barriers are minimal and most road freight industries feature many firms (Londoño-Kent, 2009).

It can be said that road industry almost has no entrance barriers because anybody who acquires a freight vehicle, whether with their own resources or by loans, can become a participant on the road freight transport market (Central Institute of Road Transport, 1994). If a small road transporting firm is in question (fewer than 5 vehicles) then the entrance barriers are very weak considering it requires little investment capital, it is possible to ensure the necessary capital easily through loans and relatively quickly acquire the permit for performing the activity (Sriraman et al., 2006). In Western Europe, weak barriers to entry and limited cross-border regulation make road freight players vulnerable to losing market share to Eastern European carriers which offer cheaper prices and road freight incumbents are facing other pressures as well. Industry margins are at their historic lows: margins on earnings before interest and taxes are, on average, 2% to 3%, and larger carriers are generating margins below 5%. The companies here have the opportunity to replace their manual processes with more efficient digital ones, adopt digital business models, and identify innovative ways to gain market share and exit the industry's low-margin trap and in that way proactively respond to the start-up challenge. Digitization is the perfect tool companies can use to differentiate themselves from the competition, attract new customers, and retain current customers in an otherwise commoditized industry (Riedl et al., 24.04.2018.). Croatian road freight companies have a relatively low average expense per employee (9.400 Euro) in relation to other member states, but it is still three times higher than the one in Romania (3.100 Euro). That is why the carriers from Romania and Bulgaria as well, represent a great threat to our transporting firms because they cannot compete with them in terms of price (Eurostat, 2014).

### **3.4. The negotiating power of suppliers**

Suppliers can largely influence the firms that use their products with the decisions on boosting the prices or lowering the quality of the products on offer. If there are large dominating companies among the suppliers, then their power is considerable (Butigan, 2008). The negotiating power of the suppliers is the mirror image of the buyer power (Tipurić, 1996). It could be defined through the relations with the suppliers of the raw materials and equipment, but also through the suppliers from the financial sector (the banks) that supply the firm with the capital, and the suppliers of the work force. The suppliers can display their negotiating power over the firms in an industry by reducing their profitability through threats or actual increase of the prices of their assortment and/or reducing the quality of the products and services but retaining the same prices. The strength of negotiation of the suppliers depends on how well they are able to set the prices that reflect the value of their assortment and the input in the observed industry, and not just their production costs (Tipurić, 1996). Porter (1985) points out that every company needs to improve their position in the industry by finding those suppliers and buyers that have limited power of negotiation. A reduction in energy operating costs, which could be achieved by an increase in fleet fuel efficiency, or an increase in operational efficiency, results in a change in the relative cost of road freight transportation. This process is essential because energy takes up a large proportion of total operating costs for transportation companies. The increase in operational efficiency can then subsequently result in an increase in the demand for such services. If this is true, the result could be an increase in total fuel consumption and that part of the energy savings obtained through the increased energy efficiency would be lost. The existence of a "Rebound Effect" is especially important in the road freight transportation sector (Matos and Silva, 2011). If we take into account that a significant portion of the road freight transportation costs goes to fuel and purchase of the freight vehicles, it can be concluded that negotiating power of the suppliers in the road industry in Croatia is exceptionally big considering the fact that five large companies operate in the area of oil derivatives (INA d.d., Tifon, Crodux derivati, Petrol and Lukoil), and seven big companies dominate in selling the road freight vehicles (Volvo, MAN, Mercedes-Benz, Scania, Iveco, DAF, Renault).

### **3.5. The negotiating power of buyers**

"Buyers within an industry compete by using the strategy of lowering the prices, negotiating better terms for the payment, higher quality or more services and turning the competitors one against the other" (Butigan, 2008). Buyers display their negotiating power over the companies by lowering their profitability, whether by pressuring for the reduction of prices or asking for better quality and/or additional services for the same price (Tipurić, 1993). Globalization and a rapid technology development influence the constant changes of the market opportunities in which the companies operate, while the consumers are very well informed of everything that the market offers and consequently, they demand the certain level of quality of the products and services they buy and use (Karlo Marijanović, 2010). The choice of transport mode has direct influence on the flows of goods, congestion and other derived external costs and is therefore a key decision in road freight transport (Jensen et al., 2019). While the amount of the goods that needs to be transported is growing by small steps, the accent is put on other qualities of the transporting services, especially the speed, accuracy and reliability of the delivery. Buyer demand and evaluation of time represent the factors of extreme importance for every business subject on the market. The growing consumer appetite for ever better product and service quality they buy influence the demand for transport and the development of the associated activities, especially transportation logistics and supply chain management (Kolaković, 2005). The way road transport is organized depends on the balance of power among the road freight operators and it has been changing over time. The clients in search for transporting services have diverse interests (Frémont and Franc, 2010). As a rule, small road transporting carriers do not have a direct contact with the buyers, but rather negotiate the deals with the shipping agents or large transporting companies (Dutz and Ibarra, 2000). Ncube, Roberts and Vilakazi (2015) point out that for a small road freight firm it is much more difficult to arrange the load of goods outside their country. They say that the reason for that lies in the fact that most potential buyers of their services actually have big loads of goods for transport and therefore prefer to do business with the companies that have a larger vehicle park or with a transporting agency. If a firm cannot achieve competitive position by the low costs or the uniqueness of the product, it should focus only on small-size buyers, and avoid those with strong negotiating power (Porter, 1979). In the research results, Simonić (2012) points out that the service quality is a critical factor for choosing the transporting operator. In case when perishable goods are transported or goods that require a special regime of transport, when the buyers are choosing the transporting service provider, they pay more attention to the size and quality of the vehicle park, while the price is not the crucial factor (Simonić, 2012). Additional services road transport companies provide include: gathering and control of all documentation regarding the transport, managing customs procedures, choosing the safety plan and giving advice regarding the transport. Most firms direct most attention towards the price, delivery time and safety. Only the firms that transport smaller amounts of goods focus their attention on the marketing strategy, while bigger firms focus on the service properties and resources. In international freight transport, consumers give advantage to those that have their own vehicles (Lazauskas et al., 2012).

### **4. CONCLUSION**

Road freight transport has been a dominating branch in land transport in the Republic of Croatia for years. Most economic systems function specifically because of road transport that enables connection between the production and the consumption. Porters five competitive forces model was used as the framework for conducting a strategic analysis of road freight transporters in Croatia. Industrial competition, danger of the substitutes and the negotiating power of the buyers and the suppliers were analysed. Croatian road freight transport is extremely fragmented and there are many small firms. They do not have the conditions for a more serious positioning on the market outside the Republic of Croatia because, as a rule, they usually own less than 5

freight vehicles. Unlike the markets abroad, on Croatian transport market there is no significant threat of the substitutes, first and foremost because rail infrastructure is very basic, and the transporting process often takes much time if railroad is used. On the other hand, the risk of new competition is very high. Especially because Croatian market is fully open for transporters from the EU, and they can also perform cabotage in the Republic of Croatia. Consumer demands are more and more tied to the quality of the service, punctuality and reliability of the delivery, and less and less to the price of the transport. Croatian road transporters have to focus on providing added value to their users and also start making alliances to integrate into larger business entities to be able to close deals outside Croatian market.

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## PROMOTING SOCIAL ECONOMY THROUGH COOPERATIVES

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### ABSTRACT

*Social economy nowadays embraces a great plurality of actors, i.e. cooperatives, social enterprises, credit cooperatives, mutual insurance companies, insurance cooperatives, various NGOs, addressed to solving developmental, social, cultural, educational, environmental and other challenges the contemporary society is faced with. The paper reflects on the role of cooperatives in addressing those challenges. Cooperatives, as people-centred enterprises owned, controlled and managed by and for their members, have significant impacts on re-directing economic processes, solving social challenges, improving the quality of life in the local community and environmental protection in many countries all over the world. The purpose of the paper is to analyse the state, trends and challenges regarding development of cooperatives, in the context of social economy, in Croatia. The research was realised in two phases during 2018, using on-line questionnaires as main research instruments. The first phase was related to specific characteristics of cooperatives operating in Croatia and challenges they are faced with while the second part was related to students' perceptions and attitudes regarding cooperatives as business models. This paper presents the result of the first research phase. The research has revealed various internal and external barriers which hinder further development of cooperatives in Croatia. The research results contribute to deeper understating of challenges and barriers cooperative are face with in Croatia.*

**Keywords:** *social economy, cooperatives, EU, Croatia*

### 1. INTRODUCTION

Various, complex and long-term consequences of the dominant neo-liberal expansionist paradigm demand the creation and implementation of a more responsible development model which will, while streaming towards economic progress, consider the long-term consequences on the quality of life of involved stakeholders, the society at large and the natural surroundings. Social economy, with its great plurality of actors, is already a powerful model of addressing those challenges. Cooperatives, as significant actors of social economy, could have an important role in that process. In many countries cooperatives already have significant impact on development processes, on solving social challenges, environmental protection and improving the quality of life in the local community. Higher education institutions and lifelong learning institutions should be powerful promoters of the cooperative business model. The purpose of the paper is to analyse the state, trends and challenges cooperatives in Croatia are faced with. The aims of the empirical research were to analyse the specific characteristics of cooperatives operating in Croatia, the implementation of cooperative values and principles in cooperatives' activities and the main internal and external constraints cooperatives are faced with in Croatia. The main research hypothesis is that cooperatives in Croatia are still faced with numerous internal and external challenges. The research has confirmed that cooperatives in Croatia are still challenged with numerous internal and external constraints which hinder their potential contribution to solving many actual social, economic and environmental issues.



## 2. THE IMPORTANCE OF COOPERATIVES IN THE CONTEMPORARY ECONOMY

Unsustainable patterns of production and consumption, especially in the last seventy years, are creating many and often negative long-term consequences on the quality of life of different stakeholders, causing environmental degradation and jeopardising the ability of future generations to satisfy their needs. There is an urgent need for a transition towards a more conscious and responsible way of satisfying needs based on justice, equity and sustainability. The process of globalisation, i.e. an economic process based on deregulation of trade and finance resulting with a single world market dominated by transnational corporations, engenders those problems. The paper proposes the concept of social economy as an important driver towards creating a more responsible development model. Social economy nowadays embraces a great plurality of actors, i.e. cooperatives, social enterprises, credit cooperatives, mutual insurance companies, insurance cooperatives, various NGOs. One of the most frequently disseminated definition of social economy in the economic literature was proposed by the Social Economy Charter in 1980 which has defined the social economy as “the set of organisations that do not belong to the public sector, operate democratically with the members having equal rights and duties and practise a particular regime of ownership and distribution of profits, employing the surpluses to expand the organisation and improve its members and to society” (Économie Sociale, 1981; Monzón, 1987, in EESC, 2017, p. 10). The importance of social economy has also been recognised at the EU level in the last three decades. Already in 1989 the European Commission published a first Communication entitled “Business in the “Économie Sociale” sector Europe's frontier-free market”. From that year the Commission has promoted the concept of social economy through many initiatives and conferences. In 2015 the Council of the European Union has adopted a Resolution on “The promotion of the social economy as a key driver of economic and social development in Europe”. Social economy has been promoted by the European Parliament since 1990 through various recommendations, initiatives and documents through the Social Economy Intergroup (EESC, 2017). The concept of the social economy is widely recognised in various EU countries. According to EESC 2017 Report, the concept of social economy enjoys the greatest recognition by public authorities, in the academic and scientific community as well as in the social economy sector itself in Spain, France, Portugal, Belgium and Luxembourg. France is pointed out as the birthplace of the concept and Spain as being the first European country which has approved the national law on social economy in 2011. Countries in which the concept of social economy have a moderate level of recognition are Italy, Cyprus, Denmark, Finland, Sweden, Latvia, Malta, Poland, the United Kingdom, Bulgaria, Greece, Hungary, Ireland, Romania and Slovenia. In these countries the concept of the social economy coexists alongside other concepts, such as the non-profit sector, the voluntary sector and social enterprises. Countries with little or no recognition of the concept of the social economy are Austria, the Czech Republic, Estonia, Germany, Latvia, Lithuania, Malta, the Netherlands, Slovakia and Croatia. In these countries the related terms non-profit sector, voluntary sector and nongovernmental organisations sector enjoy a relatively greater level of recognition. Social economy provides over 13.6 million paid jobs, equivalent to about 6.3% of the working population of the EU-28 - employment of a workforce of over 19.1 million, including paid and non-paid - more than 82.8 million volunteers, equivalent to 5.5 million full time workers - more than 232 million members of cooperatives, mutuals and similar entities - over 2.8 million entities and enterprises. The focus of this paper is on cooperatives, as significant actors of social economy. According to the International Co-operative Alliance (ICA, 2018a), cooperatives are “people-centred enterprises owned, controlled and managed by and for their members in order to realise their common economic, social and cultural needs and aspirations”. Cooperatives are managed in a democratic and equal way, so members share equal voting rights regardless of the amount of the capital invested in the cooperative.

As business driven by values, not just profit, cooperative allow people to work together to create sustainable enterprises that results with long-term jobs and prosperity. Profits generated in the cooperative are reinvested in the enterprise, returned to their members or invested in the local community. Nowadays cooperatives could not be considered as marginal phenomenon, i.e. at least 12% of humanity is a co-operator of any of the 3 million cooperatives in the world; cooperatives contribute to the sustainable economic growth and stable, quality employment employing 280 million people across the globe, i.e. 10 % of the global population. According to the World Co-operative Monitor (ICA, 2018b), the Top 300 cooperatives and mutuals report a total turnover of 2.1 trillion USD in 2016. Their distribution according to sectors of activity is as follows: 33% agriculture and food industry, 33% insurance cooperatives and mutual, 20% of wholesale and retail trade, 7% banking and financial services, 4% industry and utilities, 1% health, education and social care and 2% other activities. The features and importance of cooperatives through the last two centuries were elaborated by various authors. The development of the cooperative movement was elaborated by various authors (Owen, 1817; Restakis, 2010; Bienfield, 2004; Mataga 2009, etc.). Cooperatives are based on values of self-help, responsibility, democracy, equality, equity and solidarity. The Cooperative principles, as guidelines by which cooperatives put their values into practice, were adopted by the International Co-operative Alliance (ICA) in Manchester in 1995. Cooperative principles are: voluntary and open membership, democratic member control, member economic participation, autonomy and independence, education, training and information, cooperation among cooperatives and concern for community (ICA, 2015). Cooperatives in Croatia have a very long tradition. The first cooperative was the Craft cooperative of Pitomača founded in Pitomača in 1862. It was founded in order to promote crafts and trade and support emerging entrepreneurs. It is interesting to note that this cooperative still operates as the First Craft Savings and Credit Cooperative. At the beginning of the 20<sup>th</sup> century, there were more than 1,500 cooperatives with about 250,000 cooperative members. After the World War II, it came to collectivization in Croatia succeeding the example of the former Soviet Union and cooperatives lost their specific characteristics. In the 1950s, after the period of collectivization, cooperatives rose again through different types of cooperatives. In the following decades there were many institutional obstacles related to cooperative business model. At the end of socialist system there were approximately 200 agricultural cooperatives. After the democratic changes and independency in 1990, the new government initially treated cooperatives as institutions of the former socialist system. The Croatian Parliament adopted the Cooperative Act in 1995 as a legal foundation for existence and development of cooperatives in Croatia. (Croatian Agricultural Cooperative Association, 2000) In 2011 the Law on Cooperatives was adjusted to EU standards. The features and importance of cooperatives through the last two centuries in Croatia were elaborated by few authors (Tratnik, 2007; Mataga, 2009; Babić et al, 2011, etc.). According to the Annual report on cooperative entrepreneurship in Croatia for 2016 (Croatian Centre for Cooperative Entrepreneurship - CCCE, 2018), in 2016 there were 1,218 active cooperatives with 20.483 cooperative members, employing 2.595 persons. Cooperatives are distributed in various economic sectors. The largest number of cooperatives are in Agriculture and forestry (41%) while the least in Fishery (6%). The total income realised by cooperatives in 2016 was estimated to 0.5% of Croatian GDP. Regarding the annual revenue realised in 2016, 15% of cooperatives have realised more than 137.000 €, 26% from 13.700 € to 137.000 € and 31% less than 13.700 €. But, 28% of cooperatives have not submitted the Annul financial report although they were obliged. It is interesting to note that those 15 % of cooperatives which have earned more than 137.000 € have realised about 92% of all annual revenues of the cooperative sector. As indicated in Table 1, the biggest revenues were realised in Agriculture and forestry (52%), followed by Fishery (15%) and Manufacturing industry (11%).

*Table 1: Cooperative annual revenue according to sectors in 2016*

Sectors	Structure of income according to sectors (in %)
Agriculture and forestry	52,00
Fishery	15,00
Manufacturing industry	11,00
Construction	4,00
Trade	9,00
Tourism and hospitality	1,00
Services	8,00
<b>TOTAL:</b>	<b>100,0</b>

*Source: CCCE (2018). Annual report on cooperative entrepreneurship in Croatia for 2016. Croatian Centre for Cooperative Entrepreneurship – CCCE. Retrieved 10.02.2018 from [http://zadruga.coop/upload\\_data/site\\_files/15685717151133565576743222798\\_godisnje-izvjesce-o-stanju-zadrugnog-poduzetnistva-2016.pdf](http://zadruga.coop/upload_data/site_files/15685717151133565576743222798_godisnje-izvjesce-o-stanju-zadrugnog-poduzetnistva-2016.pdf)*

From the regional perspective, the biggest number of cooperatives in 2016 were in the Split – Dalmatia County, City of Zagreb and Osijek Baranja County. The biggest number of cooperative members are the Split – Dalmatia County, City of Zagreb and Istria County. The average number of cooperative members in 2006 was 16.78, while the average number of employees was 2.2. As it was previously mentioned, Croatia belongs to the group of EU countries with very little recognition of the social economy. Cooperatives, although having a very long tradition, today are still faced with numerous internal and external barriers which hinder their development potentials and potential economic, social and environmental impacts.

### 3. EMPIRICAL RESEARCH

#### 3.1. Research methodology

The aims of the empirical research were to analyse the specific characteristics of cooperatives operating in Croatia, the implementation of cooperative values and principles in cooperatives' activities and the main internal and external constraints cooperatives are faced with in Croatia. The main research hypothesis was that cooperatives in Croatia are still faced with numerous internal and external challenges. The research instrument was a questionnaire consisting of 23 questions. The research was realised in the period from February to May 2018. The on-line questionnaire was sent to 395 cooperatives operating in Croatia in the observed period. The contacts were offered by the Croatian Centre for Cooperative Entrepreneurship. 105 cooperatives i.e. 26.6% have fulfilled the questionnaire. The analysis presented in this paper was limited only to fully completed questionnaires, i.e. 63 of them. The questionnaires were answered by cooperative managers. The paper presents selected questions and answers.

#### 3.2. Research results

The first group of questions was related to specific characteristics of the observed cooperatives. The first question was referred to the year in which the cooperative was established. The majority of cooperatives (47.62%) were established between 2004 and 2011, followed by those established after 2011 (28.57%). It is interesting that 9.52% of cooperatives were founded before 1946, while 4.76% of them in the period from 1946 to 1976, 1.59% in the period from 1977 to 1994 and 7.93% in the period from 1995 to 2003. From the regional perspective, according to the cooperative's headquarter, the biggest number of cooperatives are situated in the Split Dalmatia county (9, i.e. 14.30%), followed by Osijek-Baranja (7, i.e. 11.11%) and Zagreb County (7, i.e. 11.11%), Šibenik–Knin County (5, i.e. 7.94), Varaždin County (4, i.e. 6.35%), Dubrovnik-Neretva County (4, i.e. 6.35%) and Bjelovar-Bilogora County (4, i.e. 6.35%), Karlovac County (3, i.e. 4.76), Primorsko-Goranska County (3, i.e. 4.76), Zadar County (3, i.e. 4.76) and Vukovar–Syrmia County (3, i.e. 4.76), City of Zagreb (2, i.e. 3.17),

Istria County (2, i.e. 3.17), Međimurje County (2, i.e. 3.17) and Virovitica–Podravina County (2, i.e. 3.17) and one (1.59%) in Koprivnica–Križevci County, Krapina–Zagorje County and Požega–Slavonia County. From the perspective of division of Croatia in two EU NUTS 2 regions, i.e. Continental Croatia and Adriatic Croatia, there are 58.73% of cooperatives in the continental part and 41.27% in the Adriatic part of Croatia. The total number of members in the observed cooperatives is 859, with the average number of members per cooperative 13,63 (the range is from 1 to 95). Considering the gender structure of cooperative members, the share of male is 77.18 and female 22.82. The observed cooperatives employ 140 employees, i.e. 2,11 employees per cooperative. The next question is related to the main activity of the cooperative. It is mostly related to various segments of agricultural production, i.e. cultivation of plants, flowers, fruits, cattle, production of different alimentary products, textiles, wood and wooden products, construction, commerce, business consulting, accounting, etc. The following question was related to the total income realised in 2017. The biggest share of cooperatives (33.80%) have realised between 13.700 € and 137.000 €, 30.9% have realised less than 13.700 €, while only 25.00% have realised more than 137.000 €. But, 5 cooperatives, i.e. 7.90 % of cooperatives have not realised any income in the observed period. The next question was related to markets on which the cooperative mostly sells its products, proposed as a multiple choice question. The majority of cooperatives i.e. 43.68% mostly sell their products on the local market, 27.59% on the national market, 19.54% on the regional market while only 9.19% on the international market. When asked about selling products through public purchasing, only 9.52% confirmed that. The second group of questions was related to the implementation of cooperative values and principles. In the first question the examinees were asked about the main motive for founding a cooperative, proposed as an open-end question. The most frequent answers were related to joint production and easier distribution of goods on the market, employment of defenders from the Homeland war, easier access to grants, self-employment, small investment deposit, sharing experience and knowledge, increased quality of life, etc. The next question was related to memberships conditions for joining the cooperative beside the legal requirements, proposed as an open-end question. The intention was to find out if the first cooperative principle related to voluntary and open access to all persons without discrimination is respected. It can be concluded that the cooperatives implement it without any discrimination. In fact, cooperatives implement positive selection, i.e. it is expected that members contribute to the realisation of cooperative's goals. The two succeeding questions were related to the second cooperative principle related to democratic member control. The examinees were asked about the frequency of meeting of the cooperative assembly. For majority of cooperatives (64.91%) it is organised once a year, in 28.07% two or three times a year, while for 7.02% at least four times. According to Croatian Law on cooperatives, all those having more than 20 members are obliged to establish a Supervisory Board. In the observed sample, 20 cooperatives have less than 20 members, so they are not supposed to have it. In the rest of the sample, in one third of cooperatives (35.14%) the Board met once a year, followed by one third of those (35.14%) who met every three months, in 18.91% the Board met every sixth months and in 10.81% once a month. The next question was related to the third cooperative principle on member economic participation. According to the previously mentioned Law, cooperatives are required to invest at least 20 % of their profits for cooperative's development. About half of observed cooperatives (49.25%) invest the minimum 20 %, one fifth (22.39) invest all their profit, while the rest invest as follows: 14.93% from 50 to 60%, 8.6% from 30 to 40% and 4.48% from 70 to 80%. In the context of the fifth principle, the next question was related to the education of cooperative managers on specific characteristics of cooperative business. It has to be pointed out that education on cooperatives as business models does not exist in Croatia, which could be considered as a significant constrain. According to the research, more than two-thirds of examinees (68.26%) have had some forms of self-education, 12.70% have attended seminars,

while 15.87% did not had any education related to cooperative business model, while 3.17% through on-line course. When asked if the education of cooperative members was financed by the cooperative, only one third (33.33%) confirmed that. It was mostly organized through professional courses for getting specific skills (fruit grower, vinedresser, distiller, olive-grower, etc.) and skills related to accounting, public purchasing, EU projects, etc. Two thirds of them (66.67%) do not invest in their members' education. The sixth cooperative principle is related to cooperation among cooperatives and cooperative associations. In Croatia 34.92% of cooperatives collaborate with other cooperatives and cooperative associations, 25.40% collaborate with other cooperatives, 11.11% with cooperative associations, while 28.57% did not collaborate et all. The next question was referred to the seventh principle related to the concerns towards the sustainable development of their communities. The examinees were asked about the financial investments in the local community development. Only 42.86% of cooperatives invest in the local community, mainly through donations for projects related traditional culture and arts, fire departments, sports clubs, defenders' associations, kindergarteners, educational programs, investments in infrastructure, etc. According to previously mentioned cooperative values, solidarity should be one very important for each cooperative. Considering that less than half of observed cooperatives is oriented towards supporting local communities, we can conclude that cooperatives to not have enough financial resources or they do not implement/respect cooperative principles and values. The third group of questions was related to internal and external challenges and constrains the cooperatives are faced with at three levels, i.e. in their business operations, at the local community level and at the national level. The first question was related to challenges cooperatives are faced with in their business process (Table 2). As it can be concluded, the biggest internal barriers are financial constraints, insufficient readiness on implementation of cooperatives principles and insufficient knowledge on cooperative management. The key external barriers are related to the fact that cooperatives are still not recognized as business entities and potential business partners and specific accounting regulations related to cooperatives.

*Table 2: Key challenges cooperatives are faced with in their business operations (multiple-choice question)*

<b>Key challenges</b>	<b>N (in %)</b>
<b>Cooperatives are not recognized as business entities</b>	54.55
<b>Financial constrains</b>	48.48
<b>Insufficient readiness on implementation of cooperatives principles</b>	31.82
<b>Insufficient knowledge on cooperative management</b>	19.70
<b>Specific accounting regulations related to cooperatives</b>	16.67

*Source: Authors' research*

The next question was related to challenges and constrains with which cooperatives are faced with in the local community (Table 3). As it can be concluded, the two biggest constrains are related to insufficient local government incentives for cooperatives and insufficient consideration of specific features related to the cooperative business model. Then, negative perceptions on cooperatives as part of the collective memory on the cooperative business model in the planned economy, insufficient knowledge on cooperatives of potential business partners on cooperatives and low interest of potential employees for recruitment in cooperatives.

*Table following on the next page*

*Table 3: Key challenges and constrains cooperatives are faced with in their local community (multiple-choice question)*

<b>Challenge</b>	<b>N (in %)</b>
<b>Insufficient local government incentives for cooperatives</b>	67.69
<b>Insufficient understanding for specific features of the cooperative business model</b>	60.00
<b>Negative perceptions on cooperatives as part of the collective memory on the cooperative business model in the planned economy</b>	29.23
<b>Insufficient knowledge on cooperatives of potential business partners on cooperatives</b>	23.08
<b>Low interest of potential employees for recruitment in cooperatives</b>	18.46

*Source: Authors' research*

The following question was related to challenges and/or constrains the cooperatives are faced with at the national level (Table 4). The biggest challenge is related to insufficient national government's understanding for the specific characteristic of the cooperative business model, followed by discriminative regulation for cooperatives compared to other legal entities, discrimination of cooperatives in public tenders compared to other legal entities, insufficient educational programs related to cooperative management and insufficient knowledge of business partners on cooperatives.

*Table 4: Key challenges the cooperatives are faced with at the national level (multiple-choice question)*

<b>Challenge</b>	<b>N (in %)</b>
<b>Insufficient national government's understanding for the specific characteristic of the cooperative business model</b>	63.08
<b>Discriminative regulation for cooperatives compared to other legal entities</b>	41.54
<b>Discrimination of cooperatives in public tenders compared to other legal entities</b>	33.85
<b>Insufficient educational programs related to cooperative management</b>	30.77
<b>Insufficient knowledge of business partners on cooperatives</b>	23.08

*Source: Authors' research*

In the next question the examinees were asked if the Croatian Law on cooperatives is adjusted to the specific cooperative business model, potentials and perspectives. More than two-thirds of examinees (69.84%) have express their dissatisfaction with the proposed legislation. More concretely, the examinees have pointed out inadequate tax regulations, very frequent changes of legislation, the regulation which is not adjusted to best practice in EU countries (e.g. Italy, Denmark, etc.). The empirical research has confirmed the main research hypothesis, i.e. the cooperatives in Croatia are still faced with numerous internal and external constrains. It is interesting to note that 9.52% of cooperatives were founded before 1946, only 13% in the period from 1946 to 1994 and 76.19% in the period from 1995 until 2018. From the NUTS2 perspective, there were more cooperatives from the continental region Croatia (58.73%) compared to Adriatic region (41.27%). The observed cooperatives are relatively small, having on average 13,63 members and 2,11 employees. As expected, the most frequent main activity is related to agriculture. Cooperatives' total annual income is relatively low, considering that only one quarter of them have realized more than 137.000 €. Considering that two-thirds of their products are sold on the local and regional market and less than 10% through public purchasing, there are significant development potentials. Regarding the implementation of cooperative principles, we can conclude that the first two principles are mostly implemented, i.e. cooperatives have voluntary and open membership and they have democratic member

control through the Assembly and Supervisory Board. Regarding allocation of surpluses, about half of observed cooperatives invest the minimum 20%. Regarding the fifth principle, only one third of cooperatives offer education to cooperative members financed by the cooperative. Concerning the sixth principle on cooperation among cooperatives, three quarter of them implement it. The seventh principle is implemented by less than half of observed cooperatives, usually explained by insufficient financial resources. The research has confirmed the cooperatives in Croatia are faced with numerous constraints in their business operations, in their local community and at the national level. The most significant internal barriers are financial constraints, insufficient readiness on implementation of cooperatives principles and insufficient knowledge on cooperative management. The key external barriers are related to the fact that cooperatives are still not recognized as business entities and potential business partners and specific accounting regulations related to cooperatives. The key constraints at the local level are insufficient local government incentives for cooperatives and insufficient consideration of specific features related to the cooperative business model. The biggest challenge is related to insufficient national government's understanding for the specific characteristic of the cooperative business model, followed by discriminative regulation for cooperatives compared to other legal entities, discrimination of cooperatives in public tenders compared to other legal entities, insufficient educational programs related to cooperative management and insufficient knowledge of business partners on cooperatives.

#### 4. CONCLUSION

Social economy nowadays embraces a great plurality of actors addressed to solving developmental, social and environmental challenges the contemporary society is faced with. The concept of the social economy is widely recognised and implemented in various EU countries. The paper reflects on the role of cooperatives, as significant actors of social economy, in addressing those challenges. Today cooperatives could not be considered as marginal phenomenon, considering that at least 12% of humanity is a co-operator of any of the 3 million cooperatives in the world, cooperatives contribute to the sustainable economic growth and stable, quality employment employing 10 % of the global population, etc. In Croatia cooperatives are almost a peripheral phenomenon, creating about 0,5 % of GDP. The presented empirical research has confirmed the main research hypothesis, i.e. the cooperatives in Croatia are still faced with numerous internal and external constraints which hinder their potential contribution to resolving many actual social, economic and environmental issues. The most significant constraints are inappropriate legal framework, insufficient institutional incentives at national, regional and local level, low level of awareness, information and knowledge on the cooperative business model of various stakeholders: potential cooperative founders, members, employees, business partners, public institutions and customers and low social consciousness on potentials and benefits that could be realised through the cooperative business model. Cooperatives in Croatia could be significant drivers towards creating a more responsible development model able to solve various economic issues, social challenges and environmental concerns. The creation of a positive and incentive social and business environment is a condition sine qua non for further development of stable, successful and sustainable cooperatives.

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## DEVELOPING MODEL OF LEADERSHIP COMPETENCIES IN THE TEXTILE AND CLOTHING INDUSTRY IN CROATIA

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### ABSTRACT

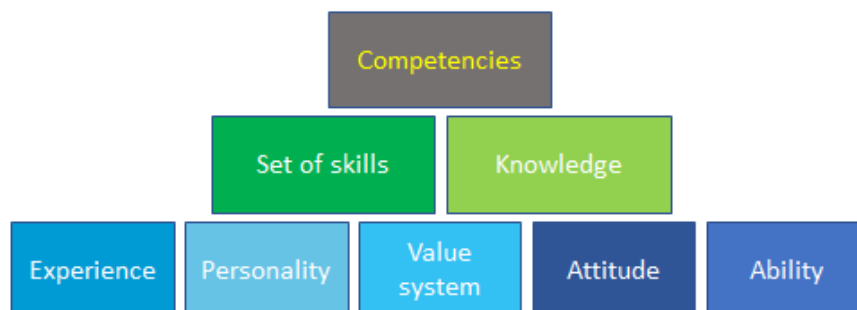
*Is the role of the leader becoming less relevant in the modern organization that's fighting for competitive position in VUCA environment? We do not think so. On contrary, we believe that the role of good leadership is probably more important than ever in history, especially in so called traditional industries. Leaders who inspire others to follow, and who incarnate the desired vision with virtue, are in demand. After transforming to market driven economy Croatian textile and clothing industry lost more than 100.000 jobs mainly because flawed privatization process, incompetent management, unclear ownership structure, short-term political focus, loss of traditional markets and many other reasons. The expected contribution of this paper is in the development of new theoretical insights on different aspects of leadership competencies in transitional economy. Leadership used to be about power, status and position and now it is about skills and knowledge but also experience, set of values, attitude and capabilities. Without defining competencies of modern leader, our ability to define and describe who, what, why and how of leadership is constrained. Competence model described in this paper help us do this.*

**Keywords:** *leadership, leaders, core competencies, textile and clothing industry*

### 1. LEADING IN THE VUCA WORLD

In stabile and simple business environments of social economy and the old hierarchical model, that depended mostly on only a few managers, their position and political links, worked well. Those who believed that future is going to similar to past are gone by. What used to work yesterday, simply doesn't work as well today, and for sure won't work well tomorrow [1]. We can't expect that we'll be able to solve 21<sup>st</sup> challenges with top-down leadership system that became obscure. In a today's more volatile, uncertain, complex and ambiguous (VUCA) business battlefield, we need new type of agile organisations run by leaders willing to work on themselves. Speed, adaptability, agility, fitness, used to be attributes of an athlete not leader. Not anymore. Current business environment of accelerated change and turbulent uncertainty is not going to blow over or settle down [2]. Decentralized control and competent leadership through empowered networks of people at all levels is imperative for success but not only that, expectations for leaders have changed dramatically over the past decade. Critical success factors in the VUCA world are: sound business principles, a firm's agility to respond speedily, strong collaborative networks, innovation and ethical practices, and they are connected to leadership capacity [3, p. 11]. Academic in the field of Management would debate on almost everything but there is few people who would doubt that P. W. Drucker had central role in development of the field, and he thought that leadership is core managerial function [4, p. 1].

Finding, supporting and developing leaders continues to be one of the biggest challenges for most organizations. The ability to develop and inspire loyalty among employees, manage change, and engage key stakeholders, foster innovation and build strong culture are some of most important elements in contemporary leadership roles. On the other hand, leadership is a word that has come to mean all things to all people [5]. Regardless of the paradigm, or the perspective, there is one core problem that seems to be persistent (to date) in leadership studies: its definition [6]. Defining leadership, as almost anything in the field of management, is not an easy task (as almost anything connected to human relations). The concept of leadership seems to be a fluid one, as there is a range of variety on what leadership means [7]. The sense of complexity and ambiguity over the current state of leadership is further complicated by the multiple definition and competing perspectives. 45 years ago, after reviewing over 3.000 studies [8, p. 7] noted "there are almost as many different definitions of leadership as there are persons who have attempted to define the concept". Bennis and Nanus [9] found 350 definitions from thousands of studies. Rost [10] found 221 definitions in 587 books and articles written from 1900 to 1990. Despite the lack of consensus over what exactly is meant by leadership, almost every definition captures process whereby influence/inspiration is exerted by one person (or many) over other person (or group of people) in order to achieve goals. Previously mentioned Stogdill together with Shartle [11, p. 287] gave one of first definitions that is still applicable defining leadership as a process of interaction between persons who are participating in goal oriented group activities. So, individual traits, influence and goal are something that almost every definition covers. Leaders usually try to achieve those organizational goals through working with others and by using others in a changing environment with the efficient (doing thing in a right way) and effective (doing right things) use of limited organizational resources. As can be seen in Picture 1 in order for leaders to be successful in carrying out their work they must be competent and competence is multilayer concept. In order to be competent, leaders need to have certain knowledge and skills, and that is something we usually cover through formal educational process. In addition to that it is so important that they have a right ability, personality, experience, attitude, and a value system. Because of all this, it is important to know that competencies are a dynamic category because none of these different categories are persistent and good leaders are constantly working on their competences knowing work there never ends. Leader wishes to emphasize the complexity of the managerial work as well as the need for constant investing in education through which the one continually improves and develops. This is especially important because a good leader is blessed by the effect of the multiplier, and the leader's competence determines not only the level of hers/his personal performance, but also the level of success of hers/his group, team or organization.



*Picture 1: Model of leader's competence*

As seen on picture 1, order to be competent leader needs to have right mixture of different elements. For example, career experience affects both individual attributes and the competences of a leader.

Some career situations and tasks can develop a leader's motivation to experience problems as challenges, to increase their cognitive abilities or to interact better with their associates. Of course, the assumption is that these situations are becoming more complex, the problems all the more difficult for a leader to lead at higher levels in the hierarchy. Here we are advocates of how leaders develop as a result of their career experiences suggesting leadership can be taught [12], [13], [14], [15].

## **2. THE COMPETENCY BASED LEADERSHIP MODEL**

Although some people think that competence and capability are synonymous there is a significant difference from leadership perspective, among these two. Inside the word capability is the word ability. There is a fine and subtle distinction between them. If someone has ability, it means that you know how to do something. If you have a capability, it means you have the power to do something. If you have capacity it means that you repeatedly proved to world that you can build value by using some of your abilities. Capabilities are widely seen as being generic, unredeemed and unrealized while competence is more in the field of realized, proven and specific. Capability is human condition of having capacity to realize or to do something with dedication, time, focus and practice, it can develop into competence. Owning a camera doesn't make one good photographer. "Capability" is derived from the middle French word "capabilité" and Late Latin word "capābili" [16]. The word was first used in 1587; however, its meaning in today's usage (underdeveloped faculty or property) only evolved and was used starting in 1778. "Competence" is derived from the middle French word "compétence" and Late Latin word "competentiae" [17]. Although French word "compétence" has its origins back in 1590s when it meant "rivalry" (based on compete), only in 1632 it gained meaning close to one it has today and that is "meaning of sufficient living in ease". In Latin "competentiae" means agreement, meeting together or symmetry. In legal sense competence as a capability or fitness to be heard in court is first time used in 1708. However, the modern meaning of the word (sufficiency to deal with a situation or task, or adequate range of capacity or ability, sufficiency to deal with what is at hand) didn't come into existence until 1790. We can conclude that both words derived from Latin and French roots, and both have earlier meanings distinct from their current, modern meanings. That's maybe why some still mix them. According to Draganidis and Mentzas [18] a competency model is a list of competencies which are derived from observing satisfactory or exceptional employee performance for a specific occupation. According to same authors the model can provide identification of the competencies employees need to develop in order to improve performance in their current job or to prepare for other jobs via promotion or transfer. The model can also be useful in a skill gap analysis, the comparison between available and needed competencies of individuals or organizations. An individual development plan could be developed in order to eliminate the gap. Important variables to be considered during the development of a competency model are the use of skill dictionaries, or the creation of customized ones and the competency identification and verification methods – surveys, interviews, focus groups, etc. Being capable is in the roots of being good leader. Leadership ability is the lid that determines a person's level of effectiveness [19]. Maxwell clearly defers (cap)ability from competence and he writes that we can't outperform our ability. Sometimes capable people become good or great leaders but it's not always the case because some people never fulfill their true potential. Usually good managers and capable to become good leaders but being manager doesn't mean that you are good leader. In addition, when selecting or/and developing leaders, organizations should consider the competencies that the individual possesses and compare those to the ones that need further development for success in a future leadership role. Competence serves as a result of the application of leadership capabilities and as a result has to build value and realize goals. An individual with capabilities can acquire a new set of skills or knowledge by learning and

practicing his/hers unique leadership style within a given context. What defined leadership yesterday may no longer be relevant today, and for sure it won't be relevant tomorrow as tomorrow's challenges require a new set of capabilities. On that foundation we built a five level model of competence and the basic premise of the competence based model is that people should be expected to perform at the level of their current competence:

- Level 1 - No competence - If-then instruction
- Level 2 - Partially competent - Supervised practice
- Level 3 - Broadly competent - Mentored practice
- Level 4 - Fully competent - Empowerment
- Level 5 - Expert - Role model

Everything starts from capability to become leader and improving performance. A great indicator for which leadership element of competence to build and which leadership action are required to begin by considering what your people are capable of. For example, if you have a team leader who is capable of creating the fully functional team in a day, it is reasonable to expect them to do so. That leader knows how to be both coach and player, and how to recognize, embrace and demonstrate that every member of the team is critical to success. That kind of leader knows how to attract team members he would like to lead. Getting the right members on the team and enabling them to show what they're capable of is crucial. However, if you have a less experienced leader who can build a team but because they have to refer to others and check their actions along the way, it takes them more time, then it is not reasonable to expect them to produce same result in a day. If you push them to deliver within the same time frame as the expert leader, you are likely to get outcome that is below standard along with a demotivated team members. Against this, if you always give this piece of work to experienced leader, how will other one gain the experience required to become an expert? So there is no simple solution to complex problem but just from this example it becomes clear that talent's capability drives both performance expectations in the short term and their development needs in the longer term. So, magic is in balance between playing safe and investing in future. Each level requires a different leadership inputs and the model is best used to differentiate these inputs and expectations on the task by task basis. A focus on leadership competencies and their development promotes better leadership [20]. Competencies needed for a particular position may change depending on the specific leadership level in the organization, industry, size of the firm, organizational culture, ownership structure and other factors. By using a competency approach, organizations can determine what positions at which levels require specific competencies [21]. By looking at leaders current competencies and comparing those to the skills necessary to fill a leadership position, organizations can make better informed decisions in hiring, developing and promoting leaders [22]. Before defining and identified some essential leadership competencies that are consistent among organizations we wanted to test our model in so called traditional industry.

### **3. CROATIAN TEXTILES AND CLOTHING INDUSTRY**

An important part of industrial production development, both in the European union and in the Republic of Croatia, is made by textile and clothing industry. The numbers are shown in Table 1. According to the data showed in Table 1, textile and clothing industry in 28 countries in Europe is quite stabile considering number of companies, and general turnover constantly growing. Index 2013-2017 is 109.64. Number of employed is also stabile, according to data available.

*Table 1: Number of employees and companies in textile and clothing industry, EU*

Year	2013	2014	2015	2016	2017
Employment in .000 Persons	1.685.00	1.680.00	1.688.00	1.699.00	1.690.00
Number of Companies	174.254.00	171.437.00	174.862.00	177.684.00	176.354.00
Turnover in bill. Euro	163.80	168.50	173.10	175.30	181.00
Household Consumption	466.00	481.20	506.70	505.30	510.90

*Source: [22]*

Table 2 presents data on the number of employees in textile and apparel industry in the Republic of Croatia.

*Table 2: The number and structure of employees in the textile and clothing industry of the Republic of Croatia*

C - Manufacturing industry	2011	2012	2013	2014	2015	2016
13 - Textiles manufacturing	4.4	4.1	3.7	3.1	3.1	3.4
14 – Clothing manufacturing	17.0	15.6	13.8	14.7	14.0	13.5
<b>Textiles and clothing manufacturing in total</b>	21.4	19.7	17.5	17.8	17.1	16.9
<b>Manufacturing industry in total</b>	214.3	207.3	197.9	220.6	196.3	n/a

*Source: [23], [24], [25]*

According to Table 2, it is concluded that almost 17.000 employees work in textile and apparel industry in Croatia, which is still a significant number. That number of employees in textiles and clothing industry present 8.7% of the total number of employees in manufacturing industry in Croatia in 2015. Number of business entities by sector from 2011-2016, is shown in Table 3.

*Table 3: Number of business entities by sector in the Republic of Croatia, 2011-2016*

C - Manufacturing industry	2011	2012	2013	2014	2015	2016
13 - Textiles manufacturing	229	221	239	241	258	268
14 – Clothing manufacturing	538	508	478	513	515	527
<b>Textiles and clothing manufacturing in total</b>	768	729	713	745	773	795

*Source: [26]*

From the Table 3 it can be concluded that number of business entities in Croatia in textile industry is in constant growth from 2012, and in clothing industry from 2013. Table 4 shows total revenue in the textile and clothing industry in Croatia.

*Table 4: Total revenue in textile and clothing industry in Croatia, 2011-2016*

C - Manufacturing industry	2011	2012	2013	2014	2015	2016
<b>13 - Textiles manufacturing</b>	178.281.565	138.701.002	201.570.268	175.885.927	190.719.546	191.168.784
<b>14 – Clothing manufacturing</b>	529.754.472	497.658.141	475.179.108	476.206.927	473.301.351	563.685.884
<b>Textiles and clothing manufacturing in total</b>	708.037.037	636.359.143	676.749.377	654.492.899	664.020.897	754.854.670

*Source: [27]*

Total revenue in textile and clothing industry in 2016 in Croatia was 754.854.670 kn (cca 100.647.289 EUR). In the Table 5 average monthly salaries of employees are presented.

*Table 5: Average monthly salaries in textile and clothing industry in Croatia, 2016 in Kn*

INDUSTRY	I-XII 2016/15				
	Activities	Average monthly salaries 2016		Paid pay per hour 2016	
		Net	Gross	Net	Gross
<b>Total - Croatia</b>		5685	7752	32.82	44.76
<b>Manufacturing industry</b>	C	5159	6940	29.55	39.75
Textiles manufacturing	C13	3934	4981	22.67	28.70
Clothing manufacturing	C14	3359	4223	19.15	24.08

*Source: [28]*

From Table 5 is clearly seen that average monthly salaries in both textile and clothing industry are lower than in overall manufacturing industry average. Paid per hour is also less. Results of the survey conducted in March 2017 (Divić, 2018) regarding level of education in textile and clothing industry are presented in Table 6.

*Table 6: Level of education, textile and clothing industry, Croatia 2017.*

	<b>C13 - Textiles manufacturing</b>	<b>C14 - Clothing manufacturing</b>
<b>Nr of employees</b>	3433	13526
<i>included</i>	30.41%	60.66%
Unfinished and finished primary school from total nr of employees	30.46%	23.99%
<i>Women</i>	72.96%	12.11%
<i>Men</i>	27.67%	3.40%
Three-year and four-year high school	58.72%	67.11%
<i>Women</i>	67.54%	61.30%
<i>Men</i>	32.46%	10.75%
College education and university degree	10.44%	8.91%
<i>Women</i>	51.38%	38.03%
<i>Men</i>	48.62%	13.82%

*Source: [29]*

It can be concluded that dominant educational level in both textile and clothing industry is three-year and four-year high school. And in the last Table in this chapter export and import activities of textile and clothing industry are presented.

*Table 7: Export & import 2016/2015 (I-XII) in thousands EUR (\*000 EUR)*

Industry	EXPORT			IMPORT		
	01.-12.2015.	01.-12.2016.	INDEX	01.-12.2015.	01.-12.2016.	INDEX
<b>Total Croatia</b>	11.527.852	12.320.582	<b>106.9</b>	18.482.861	19.686.792	<b>106.5</b>
<b>Manufacturing industry C</b>	10.133.143	10.950.514	<b>108.1</b>	15.907.112	17.292.981	<b>108.7</b>
Textiles manufacturing	142.385	155.878	<b>109.5</b>	389.768	400.688	<b>102.8</b>
Clothing manufacturing	625.841	642.482	<b>102.7</b>	837.597	918.358	<b>109.6</b>

*Source: [30]*

In the year 2016 (compared to the year 2015) export has increased in textile industry for 9.5% and in clothing industry for 2.7%, while import in the year 2016 (compared to the year 2015) has increased in textile industry for 2.8% and in clothing industry for 9.6%.

#### 4. METHODOLOGY

In this research, semi-structured interviews as qualitative methodology were used. As defined, in semi-structured interviewing, a guide was used, with questions and topics that we wanted to cover. As the defined, “semi-structured interviews are often used when the researcher wants to delve deeply into a topic and to understand thoroughly the answers provided” (RAND corporation: 27).

#### 5. ANALYSIS AND RESULTS

In order to gain idiographic overview, three different companies were chosen. One with small number of employed that produces high price level products in small quantities (C1). Second company was company with large number of employed that produces high price level as the outsourced for multinational company (C2) and third company, producer of medium price level garments for global market (C3). In order to understand beliefs and understandings about how top leaders influence organizational performance we asked all 3 CEOs to answer on statements presented in Table 8. As explained in Daft [31], this scale is about the “romance” of leadership, which is the romantic view that leaders are very responsible for organizational performance as opposed to other factors such as economic conditions. Company performance is difficult to control and is an outcome of complex forces. Attributing too much responsibility to leaders is a simplification shaped more by our own mental construction than by the reality and complexity of organizational performance. Top leaders are not heroes, but they are important as one of several key factors that can shape organizational performance [32].

*Table 8: CEO-s beliefs and understandings about how top leaders influence organizational performance?*

	True							False	
	1.	2.	3.	4.	5.	6.	7.		
1. The quality of leadership is the most important influence on the performance of an organization.	x,x	x							
2. People in top-level leadership positions have the power to make or break an organization.	x,x	x							
3. Most activities in an organization have little to do with the decisions or activities of the top leaders.						x	x,x		
4. Even in a bad economy, a good leader can prevent a company from doing poorly.				x					
5. Leaders are made, not born.		x	x	x					
6. Poor organizational performance is often due to factors beyond the control of even the best leaders.								x	
7. Eventually, bad leadership at the top will trigger poor organizational performance.	x								
8. Leaders typically should not be held responsible for a firm's poor performance.						x	x,x		
9. High quality leadership has a dominant impact on a organizational culture.	x								

*Source: adopted [33, p. 541]*

On questions 4, 6, 7 and 9 CEOs rated the same. On other questions, different answers are shown with a different color (C1 – red, C2- green, C3 – black). From given answers, it is clear that all three CEOs tend to believe that more control over performance outcome than is actually the case.

In order to clarify further believes and understandings after initial rating statements, all three CEOs were asked questions in semi-structured interviews and summarized answers are presented as follows.

1. What are your strategic approach and business model?

First CEO's (C1) main goal is to produce individual items for strong individuals, so-called opinion makers who are not considering others and what others are doing. In short, our business model is to create special items for special people. Second CEO's (C2) strategy is to produce the items in the highest possible quality level, as efficient and flexible as possible. Third CEO's (C3) strategy is the production of innovative and fine products in order to maintain the position as one of the European leaders as well as to become one of the world leaders.

2. Do you believe that presidents, top executives, and heads of profit organizations act alone and hence are largely responsible for performance?

CEOs agreed that top positioned managers in business organizations demand absolute independence in decision making, regardless of consequences. If others don't believe in their decisions they should look for other organizations. All of them are chosen (hired) based on the detailed strategic and operative programs, and, commonly, paid according to the achievements. Such an approach means full responsibility for their performance.

3. What other forces will affect your organization in the future?

World economies are faced with new challenges according to Industry 4.0. We all know that the world will look completely different very soon, but no one is completely sure how would it look like. The appliance of AI, machine learning, big data, job polarisation, nano-technologies and, above all, anticipating which skills shall be needed in the near future. Besides such general strategic approach, which is mutual for all of the examinees, narrow focus is slightly different. C1 thinks that they should focus on new distribution channels, such as web shops. He sees the strong development of retail in virtual space as an optimal chance to improve the market position. The double-sided flow of information's between customer and producer, that direct sale provides, C1 considers as the powerful tool for defining the perfect, custom made product. C2 focuses on improvement of performance, both, qualitative and productive, trough appliance of new technologies. They find a mixture of traditional skills and knowledge and complex skills demanded by the Industry 4.0 concept, as the key for improvement of the market position in the future. C3 emphasizes the importance of innovations for its products. The boundless world, as we are facing now, allows a fast and direct approach to all innovations, but the competition is also allowed to act as well. The main challenge C3 finds being the first to utilize the innovations on the market, faster and better than the competition, and, through the concept of creative destruction, constant improvement and further diversification of their products based on innovations applicable direct on products.

4. Suggest some personal traits that you believe would be useful to a business leader today. Are these traits more valuable in some situations than in others? What skills (listening, presenting, negotiating, conflict management,...) does a modern leader need to lead effectively in a turbulent environment?

An approach that employees are perceived as the most valuable resource, not cost or commodity, is what makes or breaks good leaders today. Work ethics, flexibility, adaptability, and devotion is what makes employees most valuable resource. Constant improvements of those elements by the employees mean gaining sustainable competitive



advantage. According to results that C1 performs, a single leader has all traits needed to be a good leader. C2 and C2 are reflecting differently. In multilevel management, such as they have, each position in structure demands different personality traits, and they are defined with the internal organization.

5. What are the main characteristics of a great follower (associate)?

Not simple fulfilling of given tasks, but the analytical approach to how the task could be done more effectively and efficiently. Best employees are free consultants due to the fact that there is always space for improvement and they know where and how to do it. Furthermore, C1 emphasizes loyalty as the most important characteristic. C2 and C3 are considering the ability and urge for constant learning as the most important thing.

6. Why do you think leaders are born/made (depending on answer no 5 in table 8)?

To become a leader you are about to be in a position of decision making and to be in the position of decision making, you need to have certain competencies. Same decisions in a different environment, or time frame, are resulting in different outcomes. It is impossible to be great all the time so all three believe that great leaders are partially born, partially made.

7. How do you estimate the level of ability in your company?

First CEO (C1) considers the ability as extremely high. They have a small number of employees, and each of them is highly skillful, meaning able to perform any of the operations in the production process. C2 and C3 find their employee's skills as satisfying, but they are emphasizing the lack of new people to replace the old ones. They think that the textile and clothing industry is unattractive to new generations. Despite the existing educational system, they are forced to apply to learn by doing model in the companies.

8. How do you estimate the level of capability of low management in your company?

C1 does not have low management at all. They are functioning as the team due to the small size of the company. C2 and C3 are satisfied with the capability level of low management. Tasks placed before low management are not very demanding, and they overcome them quite easily.

## 6. CONCLUSION

Modern leaders perform in a constantly changing environment and almost never in the history of civilization was harder to be a leader than today. There are various reasons for that from radical transparency due to the development of modern technology and social networks to resource scarcity and higher demand from almost all of the firm's stakeholders. Croatian managers in the textile and clothing industry consider Industry 4.0 as the only way to overcome negative externalities in the time to come. Replacing human labor with the robots and AI is already happening and that should resolve some major problems to a certain extent. Faced with the fact that employees are migrating to other industries, with the job polarisation and extinction of middle-skilled jobs, one of their main goals in the future will be to make jobs in their industry attractive again. Brynjolfsson and McAfee [34] claimed that technological progress is advancing with exponential speed and that we are currently just at the beginning of fundamental changes and technological breakthroughs that are yet to occur in the next few decades. Research on competent leadership is still at an embryonic stage. However, given its all-compassing approach toward responsible and inclusive leadership, it is certain that the model of competencies should help us understand the requirements of a VUCA world. One thing stayed as truth always and that is that leader has a role that changes continually. Future research would need to explore the explanation value of the given competence model against real-life

conditions. This would require a better understanding of elements, their influence on each other, and third the identification of a suitable leadership competency model. Such research would have to be qualitative in nature, since the framework is still in a pre-theory state, and even more so due to the “fluid, evolving and dynamic nature” of the research process [35: p. 13].

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## BIOFUEL: WHAT FUTURE FOR AFRICA?

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### ABSTRACT

*The African economy is dominated by countries with low inputs and incomes. Despite the veracity of its resources, favorable climate, and abundant labor, most African countries depend on exports of primary products. Indeed, the continent's agricultural system is a rain-fed system in the majority of its countries that generates a small-scale production that remains insufficient to meet the needs of the population and contributes to the multiplication of energy and food insecurity. In the light of these challenges, policy makers in Africa have questioned the effectiveness and usefulness of the economic strategies adopted for more rational use of resources. The biofuel is both a source of hope in the face of the challenges of energy insecurity, food and poverty in Africa and potential for economic development. Biofuels can be defined as fuels that can be produced from agricultural and forestry products or the biodegradable part of industrial and municipal waste<sup>1</sup>. The main sources of energy in rural Africa are biofuels that are used for lighting and powering engines such as wood and excreta. Africa needs to take advantage of the raw material needed to be part of this emerging industry. It needs to take advantage of its access to clean and renewable sources of energy. The survival of its population depends on the use of fossil fuels, firewood and charcoal, which greatly limits its potential for economic and social development. Thus, the continent's energy needs are growing very rapidly under the pressure of demographic factors and urbanization; this means that Africa needs to move from traditional sources of energy to new ones in order to improve the economies of the energy and reduce its dependence on fossil fuels and build the basics of development. In this paper, we aim to identify what Africa hides in its nature and serves as a true pillar of a new industry. Next, it is necessary to review how African countries have responded to this potential in terms of policy and strategy. In addition, we will end this article with a set of economic, social and environmental impacts to elucidate what biofuels have brought to Africa.*

*This article will aim to answer three major questions:*

- *Biofuels: What potential for Africa?*
- *What are the policies for biofuels in Africa?*
- *What are the positive and negative impacts of biofuels in Africa?*

**Keywords:** *Biofuel, Africa, sustainable development, energy agriculture and renewable resources*

### 1. INTRODUCTION

The history of biofuel goes back to 2003 when the European Union unveiled its biofuel promotion program. Incidentally, biofuels, fuels from renewable sources, can be liquid or gaseous, and are created from processing of non-fossil organic materials from biomass, for example vegetable matter produced by agriculture (beet, wheat, maize, rapeseed, sunflower, potato, etc.)<sup>2</sup>. Two types of biofuels are in demand on the world market: ethanol and biodiesel.

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<sup>1</sup> <https://www.britannica.com/technology/biofuel>

<sup>2</sup> <https://www.linternaute.fr/dictionnaire/fr/definition/biodiesel/>

Ethanol, which comes from starch or other forms of sugars, is produced from maize, sugar cane, sweet potato or sorghum, and more recently cassava. While biodiesel is a fuel consisting of oils vegetable recycled usually oilseeds, it's added or substituted for diesel and can thus be used for diesel engines. Indeed, energy directs our life; it is a necessary element in human activity. It has been present in our daily lives for a long time, but everyone has their own way of using it. For more than a century, the global economy has used fossil fuels such as oil, natural gas and coal as a source of energy. Today these sources are also more exploited for the production of energy electric and many consumer products. Although petroleum hydrocarbons have undeniable advantages especially for industries and the transport sector, their perverse climate effects have led some countries to think of alternative sources of cleaner energy. Alternative solutions include renewable energies such as wind, solar, geothermal and biomass. In this context, and as a substitute of fuel using biomass resources, many developed and developing countries thought to biofuels, which represent a promoter sector for years to come. Africa, as other continents have biomass resources, began in recent years to involve various political and biofuel promotion strategies to strengthen its energy efficiency and enable its people to have the basics and the necessities of development. African countries also have vast land, veracity of natural resources and existing labor; all of these characteristics fulfill the conditions necessary to establish a clean and promising industry. However, the triple challenge facing Africa is ensuring food security, energy security and sustainable development. It is true that biofuels offer the opportunity to exploit Africa's vast biomass resources, but it is essential to intensify research to improve crop yields, production methods and uses. The journey is just beginning and a set of policies and strategies must be put in place to ensure the sound exploitation of biomass and the clean production of biofuels.

## **2. BIOFUEL: WHAT A POTENTIAL FOR AFRICA?**

The human race has been using biofuels for millions of years in the form of wood, coal, peat or animal manure. However, recent advances in chemistry have made it possible to produce liquid fuels that can replace petrol and diesel from renewable sources. In another sense, biofuel is a fuel produced from renewable resources such as a tree, a plant or an animal. There are now three main sources: trees, plants rich in vegetable oils, and sugar and wheat. Other new plants such as jatropha, algae rich in hydrocarbons may also be used to produce biofuel. Inputs used for the production of biofuels have been known for a long time. Nevertheless, the processes and the development of production techniques are recent thing that traces the history of the use and transformation of these inputs into biofuels. There are three generations of biofuels, only processes and technical development that make the difference between one generation and another. The first generation consists mainly of two types of biofuels that are produced from raw materials that can be used in an animal or human food chain. Bioethanol, which occurs from sugar cane, cereals and sugar beet and is used in gasoline engines. In addition, biodiesel which occurs from different sources of fatty acids, including soybean, rapeseed, palm and other vegetable oils. It is used in diesel engines. With the introduction of technologies, cellulosic materials such as wood, leaves and stems of plants or those from waste can also be used to produce biofuel. This second-generation refers to wood components or carbon-based that are not directly used in food production. This technology makes it possible to produce so-called second-generation bioethanol, biodiesel, bio-hydrogen or biogas. It is not yet deployed at the industrial stage but prospects for implementation in the medium term are emerging. Their large-scale production is planned for 2020-2030. As for third-generation biofuels, these processes rely mainly on the use of microorganisms. In the same vein, Africa has had several attempts to develop biofuels. Initiatives in Mali date back to the 1940s, especially in the valuation of Jatropha. Nevertheless, applications have remained limited to very small-scale uses in a context of improving rural access to a few energy services.

Currently, there is a proliferation of interests within the continent. Given that Africa has a vast and middle nature the rich resources able to be used as biofuel, several African countries have developed a new energy vision. The economic and social reality of most African countries has called for the energy exploitation of renewable resources. The biofuels sector is directly involved in the development and improvement of economic growth, social development and the creation of sustainable jobs. Energy agriculture is an approach, which consists in turning agriculture to establishment of plants, may be transformed into biofuel. In the long term, local production of biofuels can be exported to both the European and American markets. The development of a biofuel industry will lead to an improvement in the lives of African rural people in view of the new jobs it has created, which would considerably reduce the high unemployment rate, which is a major economic hurdle for developing countries. South. On the other hand, and because biofuels are shown to release half as much CO<sub>2</sub> and sulfur in the atmosphere as fossil fuels, the development of biofuels would allow African countries to comply with international environmental regulations and would be very beneficial for the African population and ecosystem. Thanks to the veracity of Africa's natural resources, several plants and plants rich in concentrated oil could be used as biofuels. Indeed, biofuel can be produced from several sources such as corn, peanut, seaweed, palm, coconut, soy, sunflower and castor oil. *Jatropha* is also a promising source in West Africa since its discovery in the 1990s. The latter is a shrub that grows in the poor and dry soils of the Sahel, gives seeds rich in oil, easy to transform into diesel. Its poisonous fruits have targeted its use by limiting its spatial competition with traditional food crops. This plant that grows in arid areas to triple use: a renewable energy source for the local population using its vegetable oil as fuel, a commercial energy source by exporting biodiesel from its oil and can also be used to local cuisine, offering an alternative to wood. Given its value, it is not surprising that *Jatropha* crops have emerged in recent years in countries as diverse as Egypt, Madagascar, Zimbabwe, Kenya and Zambia. Since the end of the 1930s, Malians have recognized the possibility of using *Jatropha* oil as fuel. At present, it is used to replace the diesel mix used in the diesel engines that run the grain mills and water pumps in rural Mali. Today, we can see that several African countries have made progress in the production of *Jatropha* oil biofuel by encouraging biofuel development initiatives. Another type of biofuel existing in Africa can be obtained from biomass. This is bioethanol for gasoline engines. Vegetables containing sucrose (such as sugar cane) or starch (such as maize, sorghum or cassava) can be processed to give bioethanol, obtained by fermentation of the sugar extracted from the sugar plant or by distillation. starch from corn. This ethanol of biological origin is nothing other than ethyl alcohol, the same as that found in all alcoholic beverages. It can be mixed with gasoline in proportions ranging from 5 to 85%. In this sense, Africa could become in the near future a major producer of ethanol produced from the sugar plant or maize. There are a lot of projects going on right now for the development of the biofuel industry. A set of associations for extracting oils from energy plants that can serve as biofuels have been created in Africa. This kind of project seems to be a major opportunity for the country to stimulate economic growth, combat unemployment and poverty while enjoying the country's natural resources and labor of existing work. Still talking about ethanol, Africa has also turned to intensify cassava cultivation. Nigeria is already on this path, in early 2006, a law authorized The Nigerian National Petroleum Corporation began importing small amounts of ethanol to test its own blends and distribution infrastructure that will be then used for the Nigerian local production of ethanol Young African women gathered around a pile of cassava. Such international cooperation could support African countries in this perspective of development of the biofuel industry. Africa has also invested in the production of cellulosic ethanol from maize or switch grass not only to produce energy but also food substances. The switch grass has a variety of industrial uses, the most promising of which are paper making and ethanol production, but it can also be used to feed cattle and is ultimately a good fuel.

This perennial plant has many advantages from an agronomic and environmental point of view. First, its requirements for fertilization are minimal. Then, its culture can last between 5 and 10 years. In the same context, and in the context of the development of the biofuel sector that Africa has experienced, it is necessary to refer to Mauritius, which is an example of leadership in the valuation of bioenergy. Indeed, 40% of its energy needs are provided through cogeneration from bagasse after sugar production plants based in the sugarcane. A whole culture has chosen to move towards the development of sugar cane for the production of ethanol. Mali has also developed national strategies with clear objectives, Senegal with a national program and several countries of the southern subregion of Africa such as South Africa, Zimbabwe, and Zambia.

### **3. BIOFUEL POLICIES IN AFRICA**

The African continent is not left in the race for the development of biofuels. It is true that his experience is still very recent compared to other countries such as America and Canada, but the development of this sector in the country is too encouraging. Africa offers an ideal environment for biofuel production, with a vast expanse of unused land, a tropical climate suitable for energy farming, and a large unemployed rural workforce. Namely also that the majority of the African population suffers from poverty and devoid of the necessities such as electricity, biogas and running water. The majority cultivates seeds exclusively for food, without taking into consideration the many challenges related to the sale of seeds. In this context, the implementation of a biofuels strategy is an opportunity to put agricultural enterprises, especially those in rural areas, in a path of development and emergence. This will increase income levels, which will make it easier for people to meet basic needs, including health, medical and educational needs. There are many benefits to be gained from such a biofuel projects, which concerns not only biodiesel but also electricity. The latter can be produced from the hulls of *Jatropha* fruits while biogas can be produced from oil cakes, and leftovers are a good organic fertilizer. Several reasons explain this radical change of strategy. As it is known, a majority of African countries have always opted for a food agriculture, but the alternative energy of biofuels, has led the interest of several poor countries that suffer from an energy deficit in the hope of build a new economic model. In other words, biofuel is the hope that can lead to development while being based on the agricultural sector. This is achievable while turning the agriculture sector from food agriculture to energy farming. On the strategy side, the development of biofuels in Africa takes two forms. The first, under government impetus with the introduction of incentives for production, foreign investment and consumption of biofuels. The second is the presence of foreign private investment, which is a real driver of the development of biofuels in Africa. In the same way, the commitment of African countries in the production of biofuels is a chosen strategy e n first saw the energy offered interest biofuels. Substituting biofuels for fossil fuels would help reduce the hydrocarbon imports that most countries suffer from. Still in this logic, the pure vegetable oil sector provides a concrete and economic energy solution to remote rural areas that are poorly served by energy distribution networks. Secondly, a production of biofuels would be to valorize the agricultural potential of the African continent. Several studies indicate a significant potential of uncultivated farmland in Africa. The development of the land by the production of raw materials for biofuels ensure strong opportunity for job creation, development of the agricultural sector and economic growth. Regarding to biofuel strategies adopted in Africa, several African countries have already put in place national strategies for the promotion of biofuels. In this respect, Senegal, Ghana and Nigeria have national strategies for the promotion of biofuels. They are based on the setting up of a technical committee to define the policies to be implemented in this sector, to create an incentive legislative and regulatory framework for the production and use of biofuels and to develop in the short and medium term. Medium term bioalcohol and biodiesel.

Similarly, raw materials differ from one country to another, for Nigeria, where it specializes in the production of bioethanol from cassava and sugar cane, while Ghana's strong point is *Jatropha*, which serves as a staple food for biodiesel production. In addition to sugar cane and cassava, Nigeria is also exploring the potential use of peanuts, pumpkin seeds, *Jatropha* and oil palm for biodiesel production. In Benin, as part of the Energy Services Supply Project of the Directorate General, a program of biofuel development is being put in place and aims to produce biodiesel from castor and *Jatropha* for the agricultural sector, transport and electricity generation and bioethanol as energy cooking and as a fuel alternative to gasoline from the cashew apple. In Mali, the adopted strategy is based on *Jatropha*; this plant is very widely used as hedge in the country on about 10000 kilometers with a growth rate of 2000 kilometers a year. He appeared in Mali, from the 1930s under the French presence, but its development has been mainly driven by the initiative of the German Technical Cooperation (GTZ), which has conducted a series of projects in the country since 1987. The potential that contained this plant has been favored by many private projects and initiatives, as in the case of Mali Folkecenter located in the Sikasso area and other projects. To these many private initiatives has been added the action of the Malian public authorities. In 2004, this resulted in the establishment, at the level of the Ministry of Energy, of a national program for energy recovery of *Jatropha* oil. In response to a constant demand, the National Agency for the Development of Biofuels produced in 2008 a National Strategy for the Development of Biofuels, which set targets for 2023. It is under the supervision of the Ministry of Energy and water. In 2010, it also carried out a complementary study on the definition of Steps towards the Creation of a Favorable and Adapted Legislative and Regulatory Framework<sup>3</sup>, which detailed the three possible development models -Peasant Production for Local Use, Small-scale Industrial Production or medium-scale with farmer supply and Large-scale industrial production targeting primarily the export market. In Burkina Faso, the Directorate General for Energy of the Ministry of Mines, Quarries and Energy is in charge of these issues, through the Renewable Energies Department. The DGE commissioned a first study in 2008 on the development opportunities of biofuels in Burkina Faso. On this basis, it has prepared a draft Framework Document for biofuel development policy, which should be approved by CICAFIG, but it is not validated today. Today, there is no clear political framework in both countries for launching biofuel projects under secure conditions. The situation is, however, more advanced in Mali, where several studies have been undertaken recently with the support of UNDP. The legal void presents a risk for the operators, the farmers and therefore indirectly for the States. In the case of *Jatropha*, strategies have been validated in Mali or studied in Burkina Faso, but these do not seem realistic in view of the development difficulties of this sector. In general, biofuel policies may appear to be highly complex as they affect multiple topics and ministries.

#### **4. BIOFUELS IN AFRICA: BETWEEN POSITIVE AND NEGATIVE SPILLOVERS**

##### **4.1. Biofuel production and food security**

Food security is a global affair, defined by the World Bank in the mid-1980s as access for everyone and at all times to sufficient food to lead an active and healthy life. The individual is the central element of this definition. Therefore, we can say that if human beings cannot get their food needs, it is not because the amount of food available on the planet is insufficient, but because their purchasing power is too much weak and does not allow the satisfaction of their needs. To study the impact of biofuels on food security, we must therefore consider the consequences that may have on the purchasing power of low-income people. In other words, the exploitation of biomass in the production of biofuels by developed countries has an impact on the food security of developing countries insofar as it affects the ability of the poor in

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<sup>3</sup>Stratégie nationale de développement des biocarburants au Mali : Les étapes vers la création d'un cadre législatif et réglementaire favorable et adapté, rapport préliminaire, 28 septembre 2010.



developing countries to earn a living, on the level of food prices they pay. It is an addiction with two kinds of cause and effect relationship. The first relationship is rather beneficial for developing countries in the event that increasing biofuel consumption in developed countries can be a source of income for developing countries, thereby improving their food security. While the second relationship causes effect rather touches the inflationary side. In another way, the increase in demand for agricultural products linked to the use of biofuels in developed countries has an inflationary effect on world food prices, which will worsen food insecurity, especially in developing countries such as the developing world. African. Let's just say that the increase in world food prices will be positive or negative for developing countries depending on whether the poor are net producers or consumers, in other words if they produce more food than they consume or less. Overall, it is the poorest farmers who are often net consumers of food in developing countries because their resources, including land, are so scarce that they do not allow them to produce in sufficient quantities. what they would need to feed their families. If all these elements are taken into account in the case of Africa, it should be noted that several African countries are moving towards biofuels to enable the improvement of the population's access to modern energy services to build real development bases. For example, in 2010 the area under cultivation of sugar cane and sorghum is estimated at 2 million hectares, of which 10% is devoted to production (2 million m<sup>3</sup>) of ethanol for the fleet of the Southern African region, while 4 million m<sup>3</sup> are exported, mainly to Europe<sup>4</sup>. By 2050, the area of production is expected to expand to 6.8 million hectares in Central African regions at the expense of subsistence food production. Another example, one hectare of land that can produce 10 tons of wheat, allows to feed biofuels only one sober vehicle. This example demonstrates that vehicles that run on biofuel are big consumers of agricultural land. Biofuels lead to an increase in the price of food which results in the famine of the poorest. Indeed, millions of hectares are devoted to the production of biofuels resulting in soaring prices for raw materials and foodstuffs. According to the Food and Agriculture Organization of the United Nations (FAO), biofuels account for a third of the increase in agricultural prices. The poorest populations are therefore finding it increasingly difficult to feed themselves. Biofuels are therefore unconsciously leading to the worsening of famine in the world. In addition, to irrigate the hectares of biofuel plantations, agriculture monopolizes water in a considerable way. Indeed, it consumes 70% of the fresh water available on Earth while more than one billion men do not access to drinking water. It therefore seems inhuman to deprive the poorest of water to produce the biofuels intended for our cars. The performance of biofuels is also debatable. Indeed, these provide less energy than petroleum fuels. Thus, it takes 13 liters of super ethanol to 100Km instead of 10 liters by rolling unleaded. It is even necessary to note that at the level of the African market, the production and use of modern bioenergy are currently limited. This is due to the low level of technological development of African countries, which presents more disadvantages than benefits for the overall well-being of the people. The abandonment of subsistence food crops, shrinking the traditional farmland resulting production insufficient food, a leak of resources destined mainly export. As for the benefits or spin-offs, they could be evaluated in the context of a clean development based on the use of biofuels.

#### **4.2. Impacts of biofuels on the environment and ecosystems**

Africa, with its vast land and cheap labor, is a prime target for biofuel promoters. To this end, several foreign companies are rushing on African farmland to produce biofuels. The list is long, if there is no official census of projects, an estimate that no less than 100 production projects in twenty countries of the continent, from 50 foreign companies. In this list of investor countries, the United Kingdom holds the upper hand especially in Mali, Guinea, Senegal and Madagascar.

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<sup>4</sup> Abdoul-Kader Bafoutché, DÉVELOPPEMENT DURABLE, « Impacts des biocarburants sur l'environnement et la sécurité alimentaire », 09 JULY 2015.

Italy ranks second, followed by Germany, France and the United States. While some of these companies generate profits for the countries in which they operate, thanks to investment, employment and local use of biofuels, the majority do not generate local benefits. This is due to the nature of the articles in these contracts, which are in most cases vague and unenforceable promises, with conditions such as low rent or free priority access to water. In the same vein, the increasing use of agricultural land to produce biofuel is increasingly challenged around the world as it is accused of threatening ecosystems and the environment. Several studies blame biofuels for having a negative impact on the climate in terms of emissions of greenhouse gases and cultivated area. In other words, the liter of biodiesel from rapeseed would represent 1.2 times more emissions of effect greenhouse that liter of diesel, for soybeans, 2 times more emissions, and for palm oil, 3 times more. Thus, the production of first-generation biofuels over large areas leads to the massive use of pesticides and fertilizers. The negative impacts on soils, water resources and biodiversity are among the side effects of agricultural production in general. However, the biofuel production system makes these effects even more worrying. Thus, the foreseeable impacts on water resources are related to surface water and groundwater pollution. The severity of these spillovers is reflected in the production of biofuels resulting in land-use changes<sup>5</sup>. Moreover, the method of cultivation of second and third generation agro-fuels increases the global pressure of the soil. This overpressure can lead to degradation of soil fertility and their environmental functions. Land use changes, in particular the cultivation of grasslands or forest areas, may result in the destocking of carbon previously stored in the soil, and thus the deterioration of the regulation function of soil greenhouse gases. This loss of carbon can induce changes in soil properties and lead to degradation such as biodiversity loss. Even more diverse and sustainable bioenergy crops could have negative environmental impacts if they are intended to replace forests and natural grasslands.

## 5. CONCLUSION

In this article, we have highlighted African biomass in order to elucidate the link between it and biofuels, as well as the policies that African countries have put in place to make this industry a promoter to establish the necessary bases of development. All of these policies and strategies validated or in the study phase reflect the African desire to join a new market in the hope of ensuring its energy security from biofuels. The problem of food security is also of equal value, because of its dependence on African agricultural culture. In another way, and according to several studies and reports, the biofuel industry is undermining food security in Africa. This is by exploiting foreign companies from African farmland to produce biofuels. Such a strategy is causing many families to abandon subsistence food crops and their traditional farmland, which is leading to insufficient food production and a flight of resources for export. It is true that a large part of the jobs likely to accompany increased production of biofuels in African countries will be due to the potential increase in the use of labor at the level of farms producing raw materials. Unfortunately, since most foreign investors typically target biofuel production for export because of increased demand from developed countries, while the domestic market generally remains a secondary target, the concept of biofuels as a means to increase the national energy security of these countries is limited. In the same vein, the negative effects on ecosystems and the environment are also strong. To a lesser extent, governments in order to display the eco-label of projects and thus benefit from the financial support of international institutions mainly advance the environmental aspect of biofuels. In reality, the production of biofuels leads to the massive use of pesticides and fertilizers. The negative impacts on soils, water resources and biodiversity are among the side effects of agricultural production in general.

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<sup>5</sup> Laurent Gazull, conférence internationale : « *Enjeux et perspectives des biocarburants pour l'Afrique* » ; Ouagadougou, Burkina Faso, 27-29 novembre 2007.

Thus, the foreseeable impacts on water resources are related to surface water and groundwater pollution. Ultimately, the severity of the impacts of biofuels on the environment and food security depends on how the raw materials used to produce these biofuels are produced and processed. The fundamental question that needs to be asked is whether we are able to limit or even control the impacts mentioned and to safeguard the environment and food security in African countries. This requires vigilance and awareness among producers and consumers to meet the challenges of energy and the environment by limiting the adverse effects of initiatives whose consequences would be unavoidable. Particular attention should also be given to biofuels, the large scale development of which involves several actors. National consultation and harmonization of energy, agricultural, environmental and social policies should be ensured in order to maintain a balance between food security, energy and the right to sustainable social development. Priority should also be given to encouraging local production to meet needs at the national level and promote local value addition.

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## RELATION BETWEEN ECONOMIC GROWTH AND TOTAL WASTE PRODUCTION - TESTING THE ENVIRONMENT KUZNET'S CURVE ON THE EXAMPLE OF CROATIA

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### ABSTRACT

*This paper empirically explores the relationship between GDP per capita and the total amount of communal waste produced per capita. The aim of the paper is to check the validity of the Kuznets Environmental Curve (EKC - environmental Kuznets curve) in Croatia for the period 2004 to 2017. Kuznets environmental curve represents the relationship between certain parameters that negatively affect the environment and economic development. The environmental Kuznets curve starts from the hypothesis that increasing income, i.e. GDP, will increase environmental deterioration to a certain degree of development when degradation begins to decline. The results show that there is a linear link between these two variables in the observed period, but that the EKC hypothesis for waste cannot be confirmed on the example of Croatia. The study found that the turning point is very high compared to GDP in that period, suggesting the need to introduce a more ambitious waste management policy, introduce new technologies to establish long-term sustainable waste management and reduce the amount of waste produced.*

**Keywords:** *Environmental Kuznets Curve, Time Series Analysis, Croatia, Waste Management, GDP*

### 1. INTRODUCTION

Unsustainable use of resources and waste generation are one of the greatest environmental pressures in the world. Current patterns of global production and consumption seriously endanger the security of the planet, and the long-term economic prosperity and prosperity of the people who use the same planet, its resources, is in question. For this reason, sustainable use of resources and efficient waste management are a very important challenge facing the world. Thus, the European Union (EU) has been contributing to the problem over the past decades by implementing policies related to waste recycling and disposal. Landfilling, incineration, recycling, reuse and waste prevention are regulated by a number of EU regulations to ensure the efficient functioning of the waste management system in all Member States. Among the more important directives are the Waste Framework Directive (2008/98 / EC) and the Waste Landfill Directive (1999/31 / EC). Particularly important is Directive 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98 / EC on waste since the general objective sets out the break of the link between economic growth

and environmental impacts associated with waste generation (decoupling). Economic growth, ie growth in production and consumption is the main cause of new waste generation. The amount of waste produced has a positive and causal relationship with the Gross Domestic Product (GDP). For example, in the period from 1980 to 2005, the total municipal waste per capita produced in 15 EU Member States increased by 54% along with GDP (DG Environment News Alert Service, 2010.). Over the past few decades, many researchers have studied the relationship between economic growth and environmental pollution in various countries, using and testing Kuznets's hypothesis. Part of these researches are also presented in this paper in the chapter on literature review. The aim of this paper is to empirically examine the validity of the Environmental Kuznets Curve (EKC) in Croatia using the time series for GDP and total produced municipal waste (MSW) in the period from 1995 to 2017. The work is structured through chapters. In the second chapter, Kuznets's theory, the idea of EKC and its critique are being analyzed, while a third part of the empirical studies to test the validity of EKC is presented in the third chapter. Subsequently, the fourth chapter follows the definition of the model and the presentation of econometric results, and the final chapter presents conclusions and final considerations.

## **2. THE ENVIRONMENTAL KUZNETS CURVE CONCEPT**

Environmental Kuznets Curve has its roots in the 1955 work of a well-known American economist, Belarusian-Jewish origin of Simon Kuznets, entitled "Economic Growth and Income Inequality". The central interest of his work was to determine the character and causes of past changes in the distribution of personal income. Increases or decreases inequality in income distribution in the context of economic growth, which factors determine the level and trends in income inequality - the main issues Kuznets wanted to answer. In order to test his theory, he used data for three states - the United States, Germany and England. The results of the analysis have shown that the income distribution is unequal in the early stages of economic growth and then moves towards greater equality as economic growth continues. This relationship between income per capita and inequality in income distribution was shown by means of a curve of the reverse-letter "U", now known as the Kuznets curve. Regardless of the results, Kuznets was not content with his theory. He is aware of the poor quality of the data on which he based his theory, and he also emphasizes it in the concluding considerations of his work. "The paper is perhaps 5 per cent empirical information and 95 per cent speculation, some of it possibly tainted by wishful thinking" (Kuznets, 1955, p. 26), so it warns that the hypothesis about the relationship between inequality of income and economic development should not be taken for granted and that further research is needed. In the early 1990s, the Kuznets curve began to describe the relationship between environmental quality, ie pollution and income per capita. Environmental data becomes increasingly accessible to more and more countries, and evidence has emerged that the level of environmental degradation according to some pollutant parameters and the level of per capita income follow the same form of inverted "U" curve as in the original Kuznets curve, so that concept called the Environmental Kuznets Curve (EKC). Most sources indicate that the first such study was performed by Grossman and Krueger (1991). They analyzed the air quality across the country across different years. It was a wider exploration of the effects of economic growth caused by the signing of the North American Free Trade Agreement (NAFTA) with Mexico on environmental degradation. The results of the study showed that when a country reaches a per capita income between US \$ 4,000 and US \$ 5,000, the pollution problems are reduced with further economic growth. Mexico with GDP per capita of \$ 5,000 was at the critical point of its economic development if any further growth in GDP created additional political pressure to increase environmental protection (Grossman, Krueger, 1991, p. 36). Similar results were made by Shafik and Bandyopadhyay (1992.) in the study they conducted for the World Bank as part of the World Development Report.

The Report states that it is possible to provide continuous, even accelerated economic development with a consistent improvement of the environment, but this will require significant political, program and institutional changes (IBRD, 1992). Panayotou (1993.) in the International Labor Organization study was among the first graphically illustrating the link between different pollutants and GDP per capita. EKC is based on the hypothesis that at low levels of per capita income in pre-industrial and agricultural economies, where most economic activities include agriculture without significant environmental impacts, it is expected that the original environmental conditions will remain relatively unchanged.

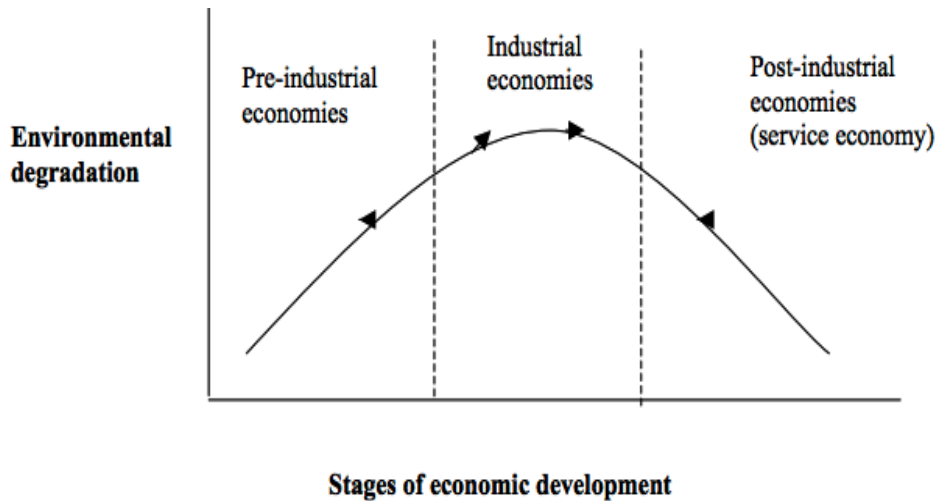


Figure 1: The Environmental Kuznets Curve: A development-environment relationship

As development and industrialization progress, grow and damage the environment due to increased emissions of polluting substances, greater use of natural resources, relatively "unclean" technology, ignorance or disturbance of the consequences of environmental growth. People in the poor countries put the material benefit in the first place, and in earlier phases of economic development the increase in pollution is considered an acceptable side effect. When the country reaches a sufficiently high standard, people are paying more attention to the environment, leading to the introduction of regulations in the field of environmental protection, new regulatory institutions and ultimately in the post-industrial phase, cleaner technologies and the transition to service and information activities are combined with growing abilities and readiness to improving the quality of the environment (Munasinghe, 1999). Panayotou (2003, p. 17) points out the most important factors that cause EKC: the effect of scale, the effect of technology and structure, the effect on income elasticity of demand for environmental quality. The magnitude of the scale suggests that a growing economic activity requires more inputs, energy and materials and creates more waste and concentration of other pollutants and thus represents a growing linear income function. The technology and structure effect present changes in the industry's share of GDP, ie a structural change in the economy over time and graphically represented as a U-shaped curve. The third effect of income-elasticity of demand for environmental quality suggests that rising income leads to increased demand for environmental quality and is graphically shown as a falling revenue function, the reverse-letter curve "J".

$\ln(E/P)_{it} = \alpha_1 + \beta_1 \ln(GDP/P)_{it} + \beta_2 (\ln(GDP/P)_{it})^2 + \beta_3 (\ln(GDP/P)_{it})^3 + \beta_4 z_{it} + \varepsilon_{it}$	(1)
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The EKC has the following shape:

where **E** is the emission, **P** population, gross domestic product **GDP** and **z** refers to other variables that affect environmental degradation such as population density, investment share, business openness, etc. Index **i** is a country, **t** is time and is  $\alpha_1$  constant. If we exclude the variable **z** from equation (1) it is possible to represent the seven types of connection between environment and income (Stern, 2003, Dinda, 2004):

(I)	$\beta_1 = \beta_2 = \beta_3 = 0$	there is no link between income and pollution
(II)	$\beta_1 > 0$ i $\beta_2 = \beta_3 = 0$	linear link between variables
(III)	$\beta_1 < 0$ i $\beta_2 = \beta_3 = 0$	linear decreasing link between variables
(IV)	$\beta_1 > 0$ , $\beta_2 < 0$ i $\beta_3 = 0$	reversed letter "U", EKC
(V)	$\beta_1 < 0$ , $\beta_2 > 0$ i $\beta_3 = 0$	U-shaped connection
(VI)	$\beta_1 > 0$ , $\beta_2 < 0$ i $\beta_3 > 0$	letter "N"
(VII)	$\beta_1 < 0$ , $\beta_2 > 0$ i $\beta_3 < 0$	reversed letter "N"

The Environmental Kuznets Curve is shown in the model indicated by (IV), and the reversal point can be calculated using the following expression:

$(GDP/P)TP = \exp\left(\frac{-\beta_1}{2\beta_2}\right)$	2
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There are a number of studies using this model to test the existence of the EKC for various environmental degradation parameters such as CO<sub>2</sub>, CO, SO<sub>2</sub>, NO, PM and other pollutants, while we will focus on total municipal waste produced in this analysis.

## 2.1. Critics of EKC

Certain works indicate that only certain environmental degradation parameters are suitable for testing EKC, which can't be tolerated for all types of pollutants. The EKC hypothesis is most credible for those air pollution indicators that have a local and short-term character, such as NO<sub>x</sub>, SO<sub>2</sub>, CO, floating particles. On the other hand, global indicators such as CO<sub>2</sub>, waste, energy consumption are either increased with income increases or their TP is high with large standard errors (Holtz-Eakin and Selden, 1995). Income is considered an exogenous variable so there is no feedback between income and pollution. The EKC hypothesis may not be sustainable even in the long run (de Bruyn et al., 1998). The economy may show an N-shaped curve that shows the shape of the reverse letter U at the beginning, but after a certain level of income the relationship between environmental pressure and income is again positive. It's another turnaround. The problem with the analysis also creates substitution between pollutants. Thus, the composition of pollutants shifted from sulfur and nitrogen oxides to carbon dioxide



and rigid waste whose level is still high, and waste per capita continues to grow (Stern, 2004). Arrow et al. (1995.) state that reducing emissions of one substance can mean an increase in the other and that economic activity inevitably disturbs the environment in some way. Finding reliable and comparable data and sample representativeness are the main challenges in assessing the relationship between economic growth and environmental pollution. In countries across the globe, data is measured by different methods, sometimes at non-representative locations (Stern, 2004.). Furthermore, different contamination definitions across countries also question the comparability of data and then the cross-sectional approach (Shafik, 1994.). For example, for our research, we observe the amount of total produced waste that harmonized when Croatia joined the EU and EUROSTAT rules.

### **3. EMPIRICAL STUDIES OF ENVIRONMENTAL KUZNETS CURVE**

Grossman and Krueger (1991.) used sulfur dioxide (SO<sub>2</sub>) emission data for 42 countries, smoke, dark matter for 19 countries and floating particles for 29 countries for 1977, 1982 and 1988 in their panel analysis. In their cubic function, they included levels of GDP per capita (according to purchasing power parity) and various other variables. The results of the analysis showed that in the case of SO<sub>2</sub> and "smoke" it is not possible to confirm EKC while for the floating particles confirmed by EKC with an estimated reversal point at the level of \$ 9,000. Shafik and Bandyopadhyay (1992.) investigated the relationship between economic growth and environmental quality in 149 countries in the period from 1960 to 1990. Particularly observed forms of ecological transformation of individual countries depending on different levels of income. The evaluation of EKC has been carried out by eight environmental quality indicators in three different functional forms. The conclusion of the study is that income has a significant impact on all eight environmental quality indicators, although this connection is not so easy as drinking water and sanitation have been found to withstand an increase in income over time. The analysis also showed that there is no link between increasing income and deforestation. Selden and Song (1994.), using a panel analysis of SO<sub>2</sub> emission data, floating particles, nitrogen oxides (NO<sub>x</sub>) and carbon monoxide (CO) in 130 countries in the period 1951-1986, explored the ratio of emissions per capita and GDP per capita. They found that the per capita emissions of all four pollutants relative to GDP have a reverse U-curve relationship. De Bruyn et al. (1998.) investigate the relationship between economic growth and CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>2</sub> emissions in the United Kingdom, the United States, West Germany and the Netherlands in the period from 1961 to 1993. The results show that the three types of pollutants are positively correlated with economic growth. In some cases, emissions increase even faster than income. They conclude that structural and technological changes in the economy can completely neutralize the positive impact of economic growth and thus affect emission reductions. The authors conclude that it can't be assumed that economic growth results in improving the quality of the environment, as only in half the cases of accumulation of income can explain the reduction in emissions. Rocca et al. (2001.) authors examine the validity of the EKC hypothesis for Spain for the period from 1980 to 1996. Used by six pollutants: carbon dioxide (1976-1996), methane, nitrogen oxide, sulfur dioxide, nitrogen oxides and non-methane organic volatile compounds (NMVOC). The estimation of the cubic functional form confirms the validity of the EKC hypothesis only in case of sulfur oxide. Their conclusion is that the relationship between the level of income and the different types of emissions depends on many factors and rejects the hypothesis that economic growth can by itself reduce the degradation of the environment. Friedl and Getzner (2003.) examine the link between economic growth and carbon dioxide emissions in Austria for the period from 1960 to 1990. In addition to GDP, as independent variables use the share of imports and services sector in GDP to include the impact of pollution haven hypothesis and structural changes. They do not confirm the EKC hypothesis, as they have determined that the N-form of income-to-pollution relationship is best suited to

the data. Egli (2004.) uses time series for eight pollutants ( $\text{SO}_2$ ,  $\text{NO}_x$ ,  $\text{CO}_2$ ,  $\text{CO}$ ,  $\text{CH}_4$ ,  $\text{NH}_3$ , SPM, NMVOC) and investigates their relationship to income, population, gross added value by sector and imports and exports of polluting products to Germany in the period from 1966 to 1999. For nitrogen oxides and ammonia, the results point to the EKC (N shape relation) with turning point at the level of EUR 15,200 or EUR 17,500 per capita. The other six indicators do not show clear results. The author concludes that it is not possible to confirm with certainty the existence of an ECC on a country's example because the results of a customized error correction model with a fundamental nonlinear long-term relationship give little evidence of its existence. Mota and Diaz (2006.) evaluate EKC for Portugal, Austria, Japan and the US using time series of  $\text{CO}_2$  emission data. For most countries, there is no evidence of the existence of ECC and deny the results of studies using cross-sectional data for the same country. Most countries have an N-shape curve. They also tested the impact of the structure of the economy, the degree of openness of the economy, short-term fluctuations in economic growth and climate factors on  $\text{CO}_2$  emissions and found that the pollution haven hypothesis can't be confirmed for all countries in the study. The utility sector positively contributes to  $\text{CO}_2$  emissions, except in the case of the US where it allows to reduce  $\text{CO}_2$  emissions. Soytaş et al. (2007.) explore the impact of energy consumption and output on US  $\text{CO}_2$  emissions in the period from 1960 to 2004. In addition to GDP, their paper includes other variables - work and gross fixed capital formation. They conclude that income does not cause carbon dioxide emissions and economic growth can't be a solution to the problem of environmental degradation as suggested by the EKC hypothesis. Ang (2007.) examines the causal relationship between  $\text{CO}_2$  emissions, energy consumption and output for France in the period from 1960 to 2000. Using cointegration and vector error correction model. There was a fairly robust long-term relationship between these variables for the aforementioned period. The results of the causal testing support the claim that economic growth has a causal effect on the growth of energy consumption and  $\text{CO}_2$  emissions in the long term, while a one-way causality from increasing energy use to growth has been established within a short time. Halicoglu (2008.) has explored the relationship between  $\text{CO}_2$  emissions, energy consumption, income and foreign trade for the period from 1960 to 2005, the Autoregressive Distributed Lag Model (ARDL) approach to cointegration and Granger Causation Test were applied to validate the relationship between income and pollution. Test Granger's causality shows that causality goes both way between  $\text{CO}_2$  emissions and short-term and long-term income. In other words, it is possible to predict the future levels of these variables from their historical mutual levels. They concluded that income is the most significant variable in explaining carbon emissions in Turkey, followed by energy consumption and external trade. The long-term elasticity of  $\text{CO}_2$  emissions with regard to energy consumption is less than one while the income elasticity of the emission is higher than one. Annicchiarico et al. (2009.) explores the relationship between economic growth and carbon dioxide emissions in Italy for the period from 1861 to 2003. To test the EKC hypothesis, cointegration technique, sliding regression was used to check parameter stability and error correction models. The results show that carbon dioxide growth and emissions are strongly related and that the elasticity of emissions of pollutants in relation to income is decreasing over time. The EKC hypothesis is confirmed for the total turnaround period at \$ 39,000. The hypothesis was tested on two subtleties with regard to the presence of structural fracture. For the first period from 1861 to 1958, a linear relationship between  $\text{CO}_2$  emissions and income was established, while for the second period between 1960 and 2003, the ECC hypothesis was accepted with a turnaround of about \$ 20,000. Shahbaz et al. (2010.) examine the existence of the EKC hypothesis for Portugal by applying the ARDL model to the timeline data. The variable of interest is  $\text{CO}_2$  emission as the exploratory variables use income, energy consumption, urbanization and degree of openness of trade in the period from 1971 to 2008. The authors find evidence of the existence of EKC in the short and long term.

Trade openness proved statistically insignificant in the short and long term, while all other variables had expected values. Wang (2011.) conducted an empirical test to test the EKC hypothesis on a sample of 138 countries in the period from 1971 to 2007, the results showed a long-term stable relationship between global CO<sub>2</sub> and GDP emissions. The Liao and Cao (2013.) panel analysis investigated the historical link between CO<sub>2</sub> emissions and economic growth for 132 countries in the period from 1971 to 2009. They surveyed the link from three aspects: data source, model specification, and assessment methodology. The results have shown that factors such as urbanization, population density, trade, energy mix and the economic environment affect the absolute level of carbon dioxide emissions. Ahmad et al. (2013.) explore the existence of the EKC hypothesis for two groups of countries, developed countries and developing countries. They used data for 40 countries between 1961 and 2009. The analysis has shown that the EKC hypothesis does not stand in all countries, especially in those where the U-shape relationship and the growing trend are shown. The paper also considers the thesis that developing countries have a very high turnaround point in contrast to developed countries. The results reveal that CO<sub>2</sub> and floating particles (PM10) are the best indicators of pollution that can be well explained with the help of GDP. Osabuohien et al (2014.) analyzes the EKC hypothesis for 50 African countries in the period from 1995 to 2010. By 2010, the results of the study suggest a long-term relationship between CO<sub>2</sub> emissions and floating particles and incomes per capita and other variables including institutional factors and trade.

#### **4. ANALYSIS OF ENVIRONMENTAL KUZNETS CURVE ON THE EXAMPLE OF CROATIA**

Professional and scientific literature on relatively small economies argues that their aggregate supply and aggregate demand depend on the dynamics of large economies. When we observe the Republic of Croatia and its economy from 1995 to 2018, that period can be divided into four periods. First, from 1995 to 2001, the second from 2001 to 2009, then from 2009 to 2014 and the fourth from 2014 to today. In the period from 1996 to 1998 (more precisely, since 1994) there has been a significant increase in the growth of a very low base. Because of this low base, there is a significant growth of all consumption categories of GDP, except commodity exports, with the largest impact on total growth having fixed capital investments. However, these investments are most encouraged by the renovation of the housing stock, infrastructure and production capacities, and less new investments. Only a minor impact was on the recovery of personal consumption and export of services. The second period is characterized by an economic policy based on state-owned investments, through borrowing abroad and multi-year double-digit growth in credit, ending with spending, with unproductive investments. Despite millions of tons of debt created from concrete and asphalt monuments, it has been shown that this economic model where the state's main investment generator is not good. In 2001, the state launched an investment cycle that reached 5.3% of GDP growth (2007), but when the cost of the money jumped, state investments grew first and then drastically cut, further deepening the crisis. The current account balance was in the following pre-crisis years:

- 2006 -6.5% of GDP,
- 2007 -7.1% of GDP,
- 2008 -8.8% of GDP.

The second period from 2009 to 2014 marks a cumulative fall of 12% of GDP. Investments fell by 40% and after the share of investment in GDP had a maximum of 31.4% in 2008, to about 20% (see below).

*Table following on the next page*

*Table 1: Croatia's GDP 1995 – 2017 (Eurostat, Croatian Bureau of Statistics, Croatian National Bank*

Year	GDP (mil EUR), market prices	GDP per capita (EUR), market prices	GDP growth rate
<b>1995.</b>	17.326,6	3.719,0	-
<b>1996.</b>	18.913,2	4.128,5	5,84
<b>1997.</b>	21.093,8	4.653,4	6,78
<b>1998.</b>	22.664,4	4.995,7	2,13
<b>1999.</b>	21.955,7	4.849,5	-1,50
<b>2000.</b>	23.582,0	5.243,1	3,77
<b>2001.</b>	25.965,1	6.044,9	3,45
<b>2002.</b>	28.531,0	6.626,6	5,25
<b>2003.</b>	30.710,8	7.133,1	5,58
<b>2004.</b>	33.423,3	7.762,5	3,91
<b>2005.</b>	36.452,7	8.456,0	4,11
<b>2006.</b>	40.158,7	9.312,2	4,87
<b>2007.</b>	43.946,8	10.188,1	5,28
<b>2008.</b>	48.138,8	11.164,0	2,04
<b>2009.</b>	45.145,4	10.475,1	-7,29
<b>2010.</b>	45.155,5	10.494,3	-1,47
<b>2011.</b>	44.825,5	10.449,2	-0,34
<b>2012.</b>	43.982,7	10.286,0	-2,30
<b>2013.</b>	43.779,2	10.271,6	-0,49
<b>2014.</b>	43.431,0	10.226,7	-0,09
<b>2015.</b>	44.605,9	10.556,8	2,40
<b>2016.</b>	46.639,5	11.129,4	3,54
<b>2017.</b>	48.989,5	11.792,7	2,92

The success of small economies and small businesses such as Croatia certainly lies in private investment. In the period since 2009, after they fell sharply, it took up to six years for their recovery and their growth began in 2015, thanks to the beginning of the consolidation of the current account balance, which for the first time achieved a primary surplus of 0.9% of GDP in 2013. The latest years from 2014 to 2018 marked the rise in GDP, most pronounced by the increase in tourist spending, the growth of private investment primarily in tourism, a significant growth of total exports. Export of goods and services is only going to exceed the level at which it was last year and continues to grow in 2014.

Today, total exports are at 21% higher, while commodity exports to nearly 46% higher. Exports of goods and services today account for over 50% of GDP and this is the biggest positive shift that has taken place in the last period. The biggest changes can be seen again through the current balance of payments account: from the large deficits that reached 8.8% of GDP in 2008, the deficit has slowly started to decline and by 2013 it has been completely eliminated and Croatia has since realized a surplus of current account balance of payments.

#### 4.1. Methodology and Data

Annual values of GDP per capita (current prices) expressed in Euros for Croatia in the period from 1995 to 2017 are taken from the Eurostat database. Data on annual quantities of total municipal waste produced in the Republic of Croatia for the same period are taken from the Report on Municipal Waste for the year 2017 of the Croatian Environmental Protection Agency for the period 1995-1997, 1997-2000, 2000-2004. The estimates from the IPZ Uniproject "Review of the Existing Situation in Municipal Waste Management" (1995) have been used for the years with missing data. The source of data on population movements is Eurostat. Municipal waste is waste generated in households and waste that is by nature and composition similar to waste from households, except waste and waste from agriculture and forestry. In accordance with the revised Waste Framework Directive (EU Directive 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98 / EC on waste), according to the Waste Catalogue (Ordinance on Waste Catalogue "Narodne novine" 90/15) municipal waste includes waste corresponding to the types of waste from subgroup 15 01 (packaging, including separately collected municipal waste wastes) and group 20 (household waste and similar waste from craft, industry and institutions, including separately collected ingredients) with the exception of the following types of waste: 20 02 02 (earth and stones), 20 03 04 (sludge from septic tanks) and 20 03 06 (waste generated by sewerage cleaning). Wastes from other groups of the Waste Catalogue are not considered as municipal waste except in cases where municipal waste that is subject to processing is assigned a key number from 19 group of the Waste Catalogue.

#### 4.2. Hypotheses

In this paper, we examine two hypotheses:

1. The EKC hypothesis does not apply to the total produced municipal waste per capita (MSWpc) on the example of Croatia;
2. High rates of economic growth lead to increase of total MSWpc in Croatia.

#### 4.3. Models and econometric results

According to the usual evaluation technique (Dinda, 2004., Lieb, 2003.) we will form a model of the following form:

$$\ln MSWpc_t = \alpha_1 + \beta_1 \ln GDPpc_t + \beta_2 \ln GDPpc_t^2 + \beta_3 \ln GDPpc_t^3 + \varepsilon_t$$

Where is MSWpc municipal waste generated per capita, GDPpc - gross domestic product per capita, and  $\varepsilon_t$  random variables. All variables in the model are transformed into logarithms. First, we will evaluate the cubic form of the model, and then, depending on the values and the significance of the parameters, the square and linear shape of the model. In order to support the theoretical views on the existence of the EKC as set forth in the previous chapters, the values of the parameters should be  $\beta_1 > 0$ ,  $\beta_2 < 0$  and  $\beta_3 = 0$ , and the turning point would be  $(GDPpc)TP = \frac{-\beta_2}{2\beta_3}$ . The results were obtained with the help of Gretl 2019a. Figure 2 shows graphs of time series of total municipal waste produced per capita and GDP per capita for the period from 1995 to 2017.

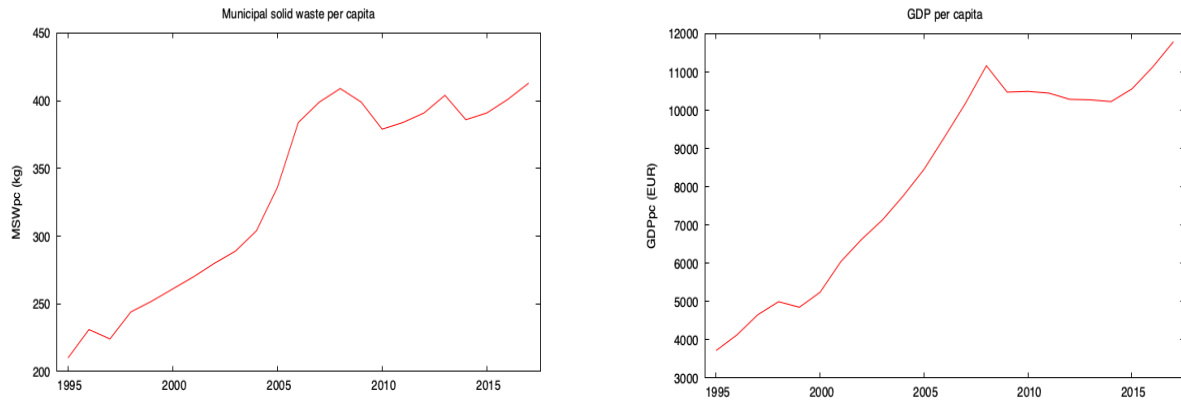


Figure 2: Graphic representation of time series for Croatia 1995 – 2017 (Authors)

At first glance it can be concluded that these two variables are nonstationary (contain the trend). Testing variables on a unit root necessary to avoid the problem of spurious regression. Namely, trend data may induce correlation that indicates the correlation between variables in regression equation when it does not really exist. The only thing that is present is the correlation between the trends (Bahovec and Erjavec, 2009.). This is also confirmed by the ADF (Augmented Dickey-Fuller) test of the unit root (Tables 1 and 2). The results of the test show that the differentiated series of  $d(\ln WWpc)$  and  $d(\ln GDPpc)$  do not contain unit root, so for both variables we say that the integrated of order one. By analyzing variables  $\ln GDPpc^2$  and  $\ln GDPpc^3$ , the same results were obtained, meaning that all variables are in the same order of integration. In order to verify whether OLS is the appropriate estimation method it is necessary to test the cointegration of observed time series. If the variables are cointegrated, their relation errors are stationary. Therefore, the existence of the unit root in a series of residuals of a single equation is tested. Since cointegration by definition is the relation between non-stationary variables, we will conduct OLS with undifferentiated variables (see Table 3a).

Table following on the next page

*Table 1: Testing the Level of Integration of the variables  $\ln MSWpc$  (Authors)*

**Augmented Dickey-Fuller test for  $l\_MSWpc$**

testing down from 8 lags, criterion AIC

sample size 21

unit-root null hypothesis:  $a = 1$

test without constant

including one lag of  $(1-L)l\_MSWpc$

model:  $(1-L)y = (a-1)*y(-1) + \dots + e$

estimated value of  $(a - 1)$ : 0,00343374

test statistic:  $\tau_{nc}(1) = 1,71803$

asymptotic p-value 0,9797

1st-order autocorrelation coeff. for  $e$ : 0,088

Augmented Dickey-Fuller regression

OLS, using observations 1997-2017 ( $T = 21$ )

Dependent variable:  $d\_l\_MSWpc$

	coefficient	std. error	t-ratio	p-value
<b><math>l\_MSWpc\_1</math></b>	<b>0,00343374</b>	<b>0,00199865</b>	<b>1,718</b>	<b>0,9797</b>
$d\_l\_MSWpc\_1$	0,238558	0,210956	1,131	0,2722

AIC: -69,5194    BIC: -67,4304    HQC: -69,066

**Augmented Dickey-Fuller test for  $d\_l\_MSWpc$**

testing down from 8 lags, criterion AIC

sample size 21

unit-root null hypothesis:  $a = 1$

test without constant

including 0 lags of  $(1-L)d\_l\_MSWpc$

model:  $(1-L)y = (a-1)*y(-1) + e$

estimated value of  $(a - 1)$ : -0,560704

test statistic:  $\tau_{nc}(1) = -3,04709$

p-value 0,00413

1st-order autocorrelation coeff. for  $e$ : -0,007

Dickey-Fuller regression

OLS, using observations 1997-2017 ( $T = 21$ )

Dependent variable:  $d\_d\_l\_MSWpc$

	coefficient	std. error	t-ratio	p-value
<b><math>d\_l\_MSWpc\_1</math></b>	<b>-0,560704</b>	<b>0,184013</b>	<b>-3,047</b>	<b>0,0041 ***</b>

AIC: -68,487    BIC: -67,4424    HQC: -68,2603

*Table following on the next page*

*Table 2: Testing the Level of Integration of the lnGDPpc variable (Authors)*

**Augmented Dickey-Fuller test for  $l\_GDPpc$**

testing down from 8 lags, criterion AIC  
 sample size 21  
 unit-root null hypothesis:  $a = 1$

test without constant  
 including one lag of  $(1-L)l\_GDPpc$   
 model:  $(1-L)y = (a-1)*y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ : 0,00260539  
 test statistic:  $\tau_{nc}(1) = 1,60287$   
 asymptotic p-value 0,9739  
 1st-order autocorrelation coeff. for e: -0,007

Augmented Dickey-Fuller regression  
 OLS, using observations 1997-2017 (T = 21)  
 Dependent variable:  $d\_l\_GDPpc$

	coefficient	std. error	t-ratio	p-value
<b><math>l\_GDPpc\_1</math></b>	<b>0,00260539</b>	<b>0,00162545</b>	<b>1,603</b>	<b>0,9739</b>
$d\_l\_GDPpc\_1$	0,498313	0,193341	2,577	0,0185 **

AIC: -65,0945    BIC: -63,0054    HQC: -64,6411

**Augmented Dickey-Fuller test for  $d\_l\_GDPpc$**

testing down from 8 lags, criterion AIC  
 sample size 21  
 unit-root null hypothesis:  $a = 1$

test without constant  
 including 0 lags of  $(1-L)d\_l\_GDPpc$   
 model:  $(1-L)y = (a-1)*y(-1) + e$   
 estimated value of  $(a - 1)$ : -0,291189  
 test statistic:  $\tau_{nc}(1) = -1,97609$   
 p-value 0,04817  
 1st-order autocorrelation coeff. for e: -0,091

Dickey-Fuller regression  
 OLS, using observations 1997-2017 (T = 21)  
 Dependent variable:  $d\_d\_l\_GDPpc$

	coefficient	std. error	t-ratio	p-value
<b><math>d\_l\_GDPpc\_1</math></b>	<b>-0,291189</b>	<b>0,147357</b>	<b>-1,976</b>	<b>0,0482 **</b>

AIC: -64,4311    BIC: -63,3866    HQC: -64,2044

*Table following on the next page*



*Table 3a: OLS, using observations 1995-2017 (T = 23), Dependent variable: l\_MSWpc (Authors)*

Coefficient	Std. Error	t-ratio	p-value
const	105,297	165,894	0,6347 0,5332
l_GDPpc	-33,8135	56,6266	-0,5971 0,5575
sq_l_GDPpc	3,75294	6,43794	0,5829 0,5668
cub_l_GDPpc	-0,136038	0,243786	-0,5580 0,5833
Mean dependent var	5,781244	S.D. dependent var	0,231569
Sum squared resid	0,023279	S.E. of regression	0,035003
R-squared	0,980268	Adjusted R-squared	0,977152
F(3, 19)	314,6295	P-value(F)	2,28E-16
Log-likelihood	46,66500	Akaike criterion	-85,33000
Schwarz criterion	-80,78802	Hannan-Quinn	-84,18771
rho	0,251607	Durbin-Watson	1,449073

**Augmented Dickey-Fuller test for uhat22 (residuals of cointegrating regression)**

testing down from 8 lags, criterion AIC  
 sample size 14  
 unit-root null hypothesis: a = 1

test without constant  
 including 8 lags of (1-L)uhat22  
 model: (1-L)y = (a-1)\*y(-1) + ... + e  
 estimated value of (a - 1): -2,29489  
 test statistic: tau\_nc(1) = -2,23195  
 asymptotic p-value 0,02471  
 1st-order autocorrelation coeff. for e: 0,118  
 lagged differences: F(8, 5) = 3,930 [0,0741]

Augmented Dickey-Fuller regression  
 OLS, using observations 2004-2017 (T = 14)  
 Dependent variable: d\_uhat22

	coefficient	std. error	t-ratio	p-value
<b>uhat22_1</b>	<b>-2,29489</b>	<b>1,02820</b>	<b>-2,232</b>	<b>0,0247 **</b>
d_uhat22_1	1,15910	0,924448	1,254	0,2653
d_uhat22_2	1,29488	0,864189	1,498	0,1943
d_uhat22_3	1,15082	0,758765	1,517	0,1898
d_uhat22_4	0,819888	0,603765	1,358	0,2325
d_uhat22_5	0,303078	0,483224	0,6272	0,5581
d_uhat22_6	0,403732	0,398945	1,012	0,3580
d_uhat22_7	0,707640	0,283640	2,495	0,0548 *
d_uhat22_8	0,448630	0,225231	1,992	0,1030

AIC: -70,547 BIC: -64,7954 HQC: -71,0794

The results of the ADF test for a series of residual deviations of the cointegration equation shows a t-value of -2,232. It is important to emphasize that the critical values of the cointegration tests differ from the critical values of standard ADF tests. Critical boundary values are less (Engel and Granger, 1987). Thus, in this particular case, the t-value (-2,232) is greater than the critical boundary of the cointegration tests, so at a level of 5% significance it can't reject the zero hypothesis about the non-stationarity of residual deviations. In other words, the residual deviations of the estimated equation are not stationary so we can conclude that the variables  $\ln \text{MSWpc}$ ,  $\ln \text{GDPpc}$ ,  $\ln \text{GDPpc}^2$  and  $\ln \text{GDPpc}^3$  are not cointegrated. This is also confirmed by the Engle - Granger test for cubic model (Table 3b.).

*Table 3b: Engel-Granger's Cointegration Test for a Cubic Model (Authors)*

**Step 1: testing for a unit root in l\_MSWpc**

Augmented Dickey-Fuller test for l\_MSWpc  
 testing down from 1 lags, criterion AIC  
 sample size 22  
 unit-root null hypothesis:  $a = 1$

test with constant  
 including 0 lags of  $(1-L)l\_MSWpc$   
 model:  $(1-L)y = b_0 + (a-1)*y(-1) + e$   
 estimated value of  $(a - 1)$ : -0,0800575  
 test statistic:  $\tau_c(1) = -1,99022$   
 p-value 0,2885  
 1st-order autocorrelation coeff. for e:  
 0,191

**Step 2: testing for a unit root in l\_GDPpc**

Augmented Dickey-Fuller test for l\_GDPpc  
 testing down from 1 lags, criterion AIC  
 sample size 21  
 unit-root null hypothesis:  $a = 1$

test with constant  
 including one lag of  $(1-L)l\_GDPpc$   
 model:  $(1-L)y = b_0 + (a-1)*y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ : -0,0575378  
 test statistic:  $\tau_c(1) = -1,68212$   
 asymptotic p-value 0,4404  
 1st-order autocorrelation coeff. for e:  
 0,067

**Step 3: testing for a unit root in sq\_l\_GDPpc**

Augmented Dickey-Fuller test for sq\_l\_GDPpc  
 testing down from 1 lags, criterion AIC  
 sample size 21  
 unit-root null hypothesis:  $a = 1$

test with constant  
 including one lag of  $(1-L)sq\_l\_GDPpc$   
 model:  $(1-L)y = b_0 + (a-1)*y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ : -0,0544886  
 test statistic:  $\tau_c(1) = -1,60205$   
 asymptotic p-value 0,4815  
 1st-order autocorrelation coeff. for e:  
 0,059

**Step 4: testing for a unit root in cub\_l\_GDPpc**

Augmented Dickey-Fuller test for cub\_l\_GDPpc  
 testing down from 1 lags, criterion AIC  
 sample size 21  
 unit-root null hypothesis:  $a = 1$

test with constant  
 including one lag of  $(1-L)cub\_l\_GDPpc$   
 model:  $(1-L)y = b_0 + (a-1)*y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ : -0,0516784  
 test statistic:  $\tau_c(1) = -1,52261$   
 asymptotic p-value 0,5223  
 1st-order autocorrelation coeff. for e: 0,051

**Step 5: cointegrating regression**

Cointegrating regression -  
 OLS, using observations 1995-2017 (T = 23)  
 Dependent variable: l\_MSWpc

p-value	coefficient	std. error	t-ratio
-----	-----	-----	-----
const	105,297	165,894	0,6347
0,5332			
l_GDPpc	-33,8135	56,6266	-0,5971
0,5575			
sq_l_GDPpc	3,75294	6,43794	0,5829
0,5668			
cub_l_GDPpc	-0,136038	0,243786	-0,5580
0,5833			

Mean dependent var	5,781244	S.D. dependent var
0,231569		
Sum squared resid	0,023279	S.E. of regression
0,035003		
R-squared	0,980268	Adjusted R-squared
0,977152		
Log-likelihood	46,66500	Akaike criterion
-85,33000		
Schwarz criterion	-80,78802	Hannan-Quinn
-84,18771		
rho	0,251607	Durbin-Watson
1,449073		

**Step 6: testing for a unit root in uhat**

Augmented Dickey-Fuller test for uhat  
 testing down from 1 lags, criterion AIC  
 sample size 21  
 unit-root null hypothesis:  $a = 1$

test without constant  
 including one lag of  $(1-L)uhat$   
 model:  $(1-L)y = (a-1)*y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ : -0,931731  
 test statistic:  $\tau_c(4) = -3,55155$   
 asymptotic p-value 0,1716  
 1st-order autocorrelation coeff. for e: 0,055

**There is evidence for a cointegrating relationship if:**

- (a) The unit-root hypothesis **is not rejected for the individual variables**, and
- (b) the unit-root hypothesis **is rejected for the residuals (uhat)** from the cointegrating regression.

Further analysis will be performed on the stationary series of first differences for each variable in the cubic model (Table 4).

*Table 4: Regression analysis of differentiated variables in cubic model; OLS, using observations 1996-2017 (T = 22) Dependent variable: d\_l\_MSWpc (Authors)*

	Coefficient	Std. Error	t-ratio	p-value		
	const	0,00915003		0,0125952	0,7265	0,4769
	d_l_GDPpc		-22,9030	96,7432	-0,2367	0,8155
	d_sq_l_GDPpc			2,50519	10,9978	0,2278
	d_cub_l_GDPpc	-0,0893007		0,416192	-0,2146	0,8325
Mean dependent var	0,030743	S.D. dependent var		0,045441		
Sum squared resid	0,031798	S.E. of regression		0,042030		
R-squared	0,266685	Adjusted R-squared		0,144466		
	F(3, 18) 2,182023	P-value(F)		0,125465		
Log-likelihood	40,71678	Akaike criterion		-73,43357		
Schwarz criterion	-69,06940	Hannan-Quinn		-72,40550		
rho	-0,107211	Durbin-Watson		2,081806		

The results show that the ratio between the total produced waste per capita and gross domestic product per capita in Croatia can't be explained by cubic form of function because high p-values indicate that no variable in the model is statistically significant. We also conduct the same analysis over the quadratic form of the model that corresponds to the EKC relationship between the variables and thus directly test the existence of the EKC relationship between the observed variables (Table 5). The results obtained by regression analysis of the first differences show that p-value for both independent variables above the empirical level of significance. Accordingly, the EKC hypothesis for Croatia is rejected.

*Table 5: Regression analysis of differential quadrature variables; OLS, using observations 1996-2017 (T = 22) Dependent variable: d\_l\_MSWpc (Authors)*

	Coefficient	Std. Error	t-ratio	p-value		
	const	0,00931089		0,7599	0,4567	
	d_l_GDPpc	-2,15588	3,01968	-0,7139	0,4839	
	d_sq_l_GDPpc	0,145736	0,171572	0,8494	0,4062	
Mean dependent var	0,030743	S.D. dependent var		0,045441		
Sum squared resid	0,031879	S.E. of regression		0,040962		
R-squared	0,264809	Adjusted R-squared		0,187421		
	F(2, 19) 3,421820	P-value(F)		0,053802		
Log-likelihood	40,68868	Akaike criterion		-75,37737		
Schwarz criterion	-72,10424	Hannan-Quinn		-74,60632		
rho	-0,101065	Durbin-Watson		2,085808		

We will continue to explore the existence of a linear relationship between total produced municipal waste and GDP per capita in Croatia. We are concerned about the impact of changes in per capita GDP on the total municipal waste produced and to what extent. From the graphical representation of these two times series it is possible to notice that they have similar dynamics of motion and we will test their cointegration. The results of the Engle-Granger cointegration test showed that variables are cointegrated (Table 6). The economic interpretation of cointegration is that there is a long-term relationship between the two observed variables.

*Table following on the next page*

*Table 6: Engle-Granger's cointegration test  $\ln MSWpc$ ,  $\ln GDPpc$  (Authors)*

**Step 1: testing for a unit root in  $\ln MSWpc$**

Augmented Dickey-Fuller test for  $\ln MSWpc$   
 testing down from 1 lags, criterion AIC  
 sample size 22  
 unit-root null hypothesis:  $a = 1$

test without constant  
 including 0 lags of  $(1-L)\ln MSWpc$   
 model:  $(1-L)y = (a-1)y(-1) + e$   
 estimated value of  $(a - 1)$ :  
 0,00519764  
 test statistic:  $\tau_{nc}(1) = 3,06393$   
 p-value 0,9987  
 1st-order autocorrelation coeff. for  
 e: 0,237

**Step 2: testing for a unit root in  $\ln GDPpc$**

Augmented Dickey-Fuller test for  $\ln GDPpc$   
 testing down from 1 lags, criterion AIC  
 sample size 21  
 unit-root null hypothesis:  $a = 1$

test without constant  
 including one lag of  $(1-L)\ln GDPpc$   
 model:  $(1-L)y = (a-1)y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ :  
 0,00260539  
 test statistic:  $\tau_{nc}(1) = 1,60287$   
 asymptotic p-value 0,9739  
 1st-order autocorrelation coeff. for  
 e: -0,007

**Step 3: cointegrating regression**

Cointegrating regression -  
 OLS, using observations 1995-2017 (T = 23)  
 Dependent variable:  $\ln MSWpc$

	coefficient	std. error
$\ln GDPpc$	0,645240	0,000875839
t-ratio	736,7	8,16e-50 ***
p-value		

Mean dependent var	5,781244	S.D.
dependent var	0,231569	
Sum squared resid	0,031207	S.E. of
regression	0,037663	
Uncentered R-squared	0,999959	Centered
R-squared	0,973548	
Log-likelihood	43,29452	Akaike
criterion	-84,58903	
Schwarz criterion	-83,45354	Hannan-
Quinn	-84,30346	
rho	0,377251	Durbin-
Watson	1,182493	

**Step 4: testing for a unit root in  $uhat$**

Augmented Dickey-Fuller test for  $uhat$   
 testing down from 1 lags, criterion AIC  
 sample size 21  
 unit-root null hypothesis:  $a = 1$

test without constant  
 including one lag of  $(1-L)uhat$   
 model:  $(1-L)y = (a-1)y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ : -0,928112  
 test statistic:  $\tau_{nc}(2) = -4,23847$   
 asymptotic p-value 0,0004208  
 1st-order autocorrelation coeff. for e:  
 0,129

**There is evidence for a cointegrating relationship if:**

- (a) The unit-root hypothesis is not rejected for the individual variables, and
- (b) the unit-root hypothesis is rejected for the residuals ( $uhat$ ) from the cointegrating regression.

Furthermore, the regression analysis of differentiated linear model variables shows that there is a linear correlation between variables (Table 7). The estimated value of parameter  $d$  ( $\ln GDPpc$ ) is statistically significant in the model that reads:

$$d\ln MSWpc_t = 0.00948 + 0.4053d\ln GDPpc_t$$

Thus, the growth of GDP per capita by one percentage point results in an increase in the total produced municipal waste per capita in Croatia (MSW per capita) of 0,4053 percentage points. This relationship is rather weak ( $R^2 = 0.2368$ ) and since the model is estimated by the first differences of variables to ensure stationarity, this result applies only for short-term model dynamics.

*Table 7: Regression analysis of differentiated linear model variables; OLS, using observations 1996-2017 (T = 22) Dependent variable: d\_l\_MSWpc (Authors)*

	Coefficient	Std. Error	t-ratio	p-value	
const	0,00948189	0,0121659	0,7794	0,4449	
d_l_GDPpc	0,405301	0,162660	2,492	0,0216	**
Mean dependent var	0,030743	S.D. dependent var	0,045441		
Sum squared resid	0,033090	S.E. of regression	0,040675		
R-squared	0,236891	Adjusted R-squared	0,198736		
	F(1, 20) 6,208587	P-value(F)	0,021613		
Log-likelihood	40,27871	Akaike criterion	-76,55741		
Schwarz criterion	-74,37533	Hannan-Quinn	-76,04338		
rho	-0,038081	Durbin-Watson	2,018736		

## 5. CONCLUSION

The aim of this paper is to investigate the validity of Environmental Kuznets Curve on the example of Croatia through empirical analysis. As an indicator of environmental degradation, data on total produced municipal waste were used in the period from 1995 to 2017. The analysis established a linear correlation between the economic growth expressed in GDP per capita and the total produced municipal waste per capita in the observed period, which means that the EKC hypothesis for Croatia can't be confirmed. Since the model was estimated by the first differences of variables to ensure the stationarity of the series, this result refers only to the short-term dynamics of the occurrence. Accordingly, the EKC hypothesis for Croatia in the long run can't be completely rejected, because Croatia may be on the upward curve, and the level of GDP at the turning point should only be reached. As noted in the previous chapters, the form of EKC is not only influenced by GDP, but also by other factors. That is why Croatia, if it wants to speed up the process of separating economic growth and waste generation, has to implement the elements of the EU's resource efficiency policy faster and more efficiently. This is partly possible through more effective implementation of regulations and the introduction of innovative solutions based on examples of good practice in the EU through the introduction of new technologies and through the introduction of market mechanisms in the area of waste collection and recovery. However, when we are talking about reducing total waste generated, the biggest challenges are precisely in waste prevention and reuse policies that are predominantly required by producers to change the existing patterns of production and packaging of products, and from consumers changing the way the product is used and their a prolonged lifecycle and all that the total amount of waste will be reduced.

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# THE GOING CONCERN'S ACCOUNTING PRINCIPLE AND ITS INCORPORATION IN CORPORATE INCOME TAX LAW OF SPAIN

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## **ABSTRACT**

*The main goal of this paper is to understand how the going concern's accounting principle was merged in the Spanish corporate income tax law. During this study the national tax law dispositions was analysed and an effort was made towards understanding what kind of tax figures or tax rules obey the investigated accounting principle in the studied jurisdiction. For this purpose, the spanish tax law was examined, particularly the - Ley del Impuesto sobre Sociedades. The results show that the going concern accounting principle was incorporated in the spanish accounting and tax laws, mainly because it assumes the accounting profit as a starting point to determine the taxable profit. Therefore, the accounting principles are incorporated, expressly or implicitly, in Spain's jurisdiction. It is possible to find the going concern accounting principle in several tax figures, such as the deduction of tax losses, the reinvestment and the capitalization reserve. The recognition or use of these fiscal figures by the company shows its determination in continuing to develop its activity. The case of the deduction of tax losses is one example because it makes sense that the company's taxable capacity can be determined under several tax periods and not an isolated period. Another is the case of reinvestment. When the legislator foresees an exemption, a reduction or a deferral of the tax bases in consequence of the reinvestment he deduces that this entity is fuctionig in continuity and will continue to operate in a predictable future.*

**Keywords:** *accounting principle, corporate income tax law, going concern, Spain*

## **1. INTRODUCTION**

In the 40's, a study of Paton and Littleton (1940, p. 7) assumed the "continuity of activity" as a "basic concept or assumption" that "constitutes a suitable foundation for the discussion of accounting standards which follows". They also emphasize that the entities' liquidation is not an ordinary situation, because the normal expectation is for the companies to continue their activity. But the importance of this assumption was reinforced with individual studies earlier (Littleton, 1938; Paton, 1922). As Sterling (1968) referred the "going concern" seemed to be an accounting concept totally accepted, and it has been a "necessary axiom". So, some literature did not explicitly reject it, assuming it tacitly as a model (Sterling, 1967; Wixon, 1965; Zlatkovitch & Association, 1966). Having a status as an axiom it would be expected for it to have been largely developed, but that is not the case. It was defended by Sterling (1968) and these assumptions are still unaltered today (Berglund, Eshleman, & Guo, 2018; Holzmann & Munter, 2015; Kaczmarczyk, 2018). Some authors have argued that the going concern is a necessary assumption to accounting (Paton & Littleton, 1940). Others defend that it is a necessary concept to the corporation's management (Grady, 1965; Trainor, Phillips, & Cangialosi, 2018). On the other hand, there are also those relate the going concern postulate with the company's successful activity, assuming that its continuity is not expected if the entity presents continuous losses (Grady, 1965; Graham, 1959). The relevance of the going concern accounting principle was also recognized by international accounting associations. "The primary function of accounting is to accumulate and communicate information essential to an understanding of the activities of an enterprise". "To accomplish this function most effectively, accounting must to develop within a definite framework of concepts and standards" (American Accounting Association, 1957, p. 536).



In the same document, the American Accounting Association (1957) recognizes the accounting underlying concepts, in which is included the "Enterprise Continuity". In this document it is possible to read that "in the absence of evidence to the contrary, the entity is viewed as remaining in operation indefinitely". This work also assumed that entities' commercial circumstances are in continuous alteration, but it is expected that conditions of the business activity will continue to satisfactorily maintain the enterprise's ability to operate. With this assumption it is expected that the assets will continue to be useful to the company's main objective and for the purpose they were purchased. On the other hand, it is expected that the liabilities will be paid on the maturity date. In order to achieve this the Executive Committee of the American Accounting Association (1948) developed the accounting concepts and standards underlying the corporate financial statements. Likewise, the American Institute of Certified Public Accountants (1973) considered "The basic objective of financial statements is to provide information useful for making economic decisions". IASC designed both the going concern and the accruals basis as "fundamental hypothesis" and "fundamental accounting assumption" (Alba 2004).

## 2. THE PRINCIPLE IN ACCOUNTING LAW

According to article 38 of the Spanish Commerce Code<sup>1</sup> annual accounts include the entities' economic transitions. These elements are registered and valued in accordance with generally accepted accounting principles, among which the going concern accounting principle. Line a) of that article states that unless proven otherwise, it will be presumed that the company continues to operate. The Capital Companies Law<sup>2</sup> does not make any express reference to this principle. It is the opposite of the preceding law, the Spanish Law of Anonymous Societies<sup>3</sup>. Article 37 of this law refers that only in exceptional cases will be allowed the non-application of the going concern accounting principle. In 1980 the Spanish Association of Accounting and Business Administration<sup>4</sup> recognized this concept as an accounting principle (AECA, 1980). Point three of the Spanish accounting law's conceptual framework, determines that in those cases in which the right application of this principle is not possible, the entity must apply the valuation standards that are more appropriate to reflect the true and fair view of economic transactions. Nevertheless, the notes to the annual accounts shall include all relevant information concerning the applicable criteria. The preparation of annual accounts should take into account all the information that may affect the going concern accounting principle, particularly the Spanish registration and valuation standard<sup>5</sup> - Norma de Registro y valoración (NVR) – number 23, that refers to the facts occurring after the close of the financial year. This standard determines that this assumption is not applied to the annual accounts if the managers know that the entities will cease activity. Even if this information is known after the end of the fiscal year (Constans, 2012). This situation occurs when the directors of the companies are aware that certain events that possibly will influence the normal operation of the company will occur. In this case, additional information must be given in financial statements. In spite of this, the Spanish accounting law refers that, if it is realistic to assume that it might be impossible for the entity to continue its normal business operation, the fall of the going concern assumption must be revealed explicitly. It also needs to be informed about the alternative hypotheses and reasons why the company can not be considered a running company. The reasons presented to justify these situations can be financial, operating, legal or other (Larraz, Hacienda, & Cuentas, 1999).

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<sup>1</sup> *Código de Comercio - Real decreto de 22 de agosto de 1885 (CC)*

<sup>2</sup> *Ley de Sociedades de Capital - Real Decreto Legislativo 1/2010, de 2 de julio (LSC)*

<sup>3</sup> *Ley de Sociedades Anónimas - Ley de 17 de julio de 1951 (LSA)*

<sup>4</sup> *Asociación Española de Contabilidad y Administración de Empresas (AECA).*

<sup>5</sup> *Norma de Registro y valoración (NVR)*

With this purpose the Resolution of October 18, 2013 of the Spanish Institute of Accounting and Audit of Accounts<sup>6</sup> - ICAC was published. This document clarifies the adopted criteria to formulate annuals accounts when the application of the going concern principle is not possible. It makes reference to concrete situations which may undermine this assumption, and which are not limited to corporate liquidation assumptions. These situations may occur due to the legal ownership and the corporate object. In the case of the legal ownership it can happen in situations such as mergers, divisions, separation of members, expulsion of members, cause of dissolution due to situation of equity imbalance, bankruptcy, dissolution and liquidation. In the case of corporate object it can occur due to deep disasters, catastrophes, real inactivity and partnerships of limited duration (ICAC & Lavandera, 2015).

### **3. CONCEPT IN CORPORATE INCOME TAX LAW**

The tax profit has an accounting basis (Smith, 2015). This means that corporate taxes uses the net profit obtained through the financial accounting to calculate the companies' taxes (Hines, 2005). The accounting profit is not assumed automatically, it is necessary to observe if corporate tax law has specific corrections at net profit (Crane & Beale, 2012). The determination of a corporate's profit needs to observe several principles known as Generally Accepted Accounting Principles or GAAP. So, if the corporate tax law assumes the companies' profit, it means that the accounting principles are designed for the tax domain (Nabais, 2018). One accounting principle is the going concern's accounting principle, that it is predicted in accounting legislation - Plan General de Contabilidad (Amat, Aguilá, & Marín, 2018). This principle is designed for the tax domain through the article 10.3 of LIS, in case of Spain (J.M. Queralt, Serrano, López, & Ollero, 2019). Thus, it is important to understand how this prediction is foreseen in accounting and tax law, particularly, in the tax law of Spanish companies. Although the LIS adopted the going concern accounting principle, it does not do it explicitly (Lapatza, Fernández, & Márquez, 2013). The accounting assumptions are tacitly accepted, without exceptions. The acceptance is made through the dispositions of article 10.3 (Ortega, 2015). Despite this, it is important to analyse how this principle is observed in this law. So, it is possible to identify situations that comply with this assumption. They are the negative taxes bases, reinvestment and the capitalization reserve. The tax losses obtained in a fiscal year can be compensated with positive tax bases obtained for the same taxpayer during the following fiscal years (Crane & Beale, 2012). In these terms article 10.1 of the LIS points out that the tax basis will be the income obtained in the economic year after deducing the offsetting of the tax loss carried forward by previous tax periods. This fiscal disposition has underlying the going concern accounting principle. It happens for several reasons. First, due to tax revenue, tax jurisdictions determine that the tax period is one year (Hines, 2005). The LIS recognizes corrections to the accounting profit in order to determine the real taxable capacity of the company. Nevertheless, the effective economic capacity of the entity can only accurate in the moment of liquidation (Sterling, 1968). Only at this time will the beginning and the end of its business' life will be known. The global profit of the company's life over the years will be obtained. Moreover, there are those who advocate a more radical taxation model, considering that business taxation should occur only when the company is liquidated (Mara, 2007). The economic ability of the companies only is real if there is a relationship with the different periods of business' life. In corporate income tax it happens due to the possibility to deduce tax losses in positive taxable bases of following fiscal periods. This process is fairer and representative of the real capacity of the entities in case the legal dispositions do not present a temporal limitation to compensate these tax losses. Any temporal limitation to the deduction, implies a departure from the taxation on the actual profit obtained, that is, the real profit. Article 26 of the same law presents the same idea.

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<sup>6</sup> Instituto de Contabilidad y Auditoría de Cuentas (ICAC)

This disposition allows the compensation of negative taxable basis without temporal limitation. This norm allows the reflection of the company's true taxable capacity. The following articles, 31.6 and 32.5 of the LIS, allow the deduction of the fiscal losses in the following years in the same terms referred previously. They refer specifically to the international double taxation and international double economic taxation, respectively. The reinvestment of the realization value is another situation that manifests the presence of the accounting principle under study. For several reasons big and small companies sell assets that are not related with their normal activity (Cholbi, 1997). Among them, the devaluation, the insufficient productive capacity, the equipment replacement needs or finding better business opportunities. These operations lead to the achievement of gains or losses. The result obtained is taxed income (DGI, 2008). However, most of the times companies sell goods of their non-current assets. They need to acquire other goods to replace the ones that were sold so that the company can continue its normal activity. But, when the profit obtained with the sale is taxed it implies the loss of economic capacity to make reinvestments in other assets (Morais, 2009). For this, tax law assumes some legal dispositions in order to reduce the taxation on this kind of income when there is an acquirement of new goods (Lapatza et al., 2013). These are tax benefits that can be tax exemptions or tax deferral (Juan Martín Queral, Serrano, Ollero, & López, 2009). Presuming that the entity has the intention to continue with its normal operation. When the legislator foresees an exemption, a reduction or a deferral of the tax bases, in consequence of reinvestments, he deduces that this is an entity that will continue to operate in a predictable future. Reinvestments require that the gain obtained with the sale will be directed to the acquisition of new asset in order to produce future economic benefits (L. A. M. Pascual & Zamora, 1998). The company can only prove a reinvestment was made by remaining in operation. If the reinvestment figure was not legally typed, the capital gain would be fully taxed at the time of the disposal of the asset (L. M. Pascual, Gálvez, Gómez, & Pino, 2013). In the LIS, it is possible to find some these kinds of situations. First, article 23.1 of the LIS assumes one reduction in 60% in the taxable basis in the gains obtained in the alienation of intangible assets. Then, concerning the mining tax regime, article 92.3 of the LIS considers a reduction of the taxable bases in a context of depletion of resources. This happens in the specific case of reinvestment in the subscription or acquisition of shares representing the capital stock of mining companies. Article 93 indicates the requirements to obtain this tax benefit. Finally, the final part of article 110.1.c) of the LIS, predicts the regime for partially exempt entities (Genders, 2019). The capitalization reserve is inserted in the Chapter that refers to "reductions in the taxable base" of the Law 27/2014 of November 27, as predicts article 25 of the LIS. This results in the non-taxation of that part of the profit that is destined to form an unavailable reserve. It does not establish any requirement of investment of this reserve in any particular type of asset. According to the preamble of the LIS, this measure is intended to promote corporate capitalization through the net equity increase. In addition it also encourages the improvement of businesses and their competitiveness. It shows a clear belligerence of the Corporate Income Tax in the replacement of the foreign capital with its own capital. The corporate capitalization, through the net equity increase, allows greater financial balance and, as a direct consequence, the permanence of the company in normal activity. The capitalization reserve, even though it does not have mandatory application in reinvestment, serves to finance the normal operation of the company, contributing to the "proper actions" of this type of economic agents. The companies' normal operation presupposes, among other requirements, the acquisition of production assets and the purchase of the equipment necessary for production. These actions promote the continuity and permanence of the company in the market.

#### 4. CONSLUSION

The accounting assumption of the going concern has recognized importance in different areas, such as the commercial, accounting and taxation areas. In the Spanish commercial law, this principle is invoked under the generally accepted accounting principles. The accounting law gives specific information on how the entities need to proceed if this assumption can not be obeyed. Therefore, annual accounts must be prepared taking as underlying a specific spanish registration and valuation accounting standard – NVR 23. The relevance of this tenet is also recognized by corporate income tax law. Here it is possible to find some tax figures that demonstrate the acceptance of this assumption. They are the reinvestment, the capitalization reserve and the possibility to deduce negative taxes bases. All that fiscal norms have as underlying the assumption that the entities will continue their activity. This recognition only happens because tax law assumes the profit determined in accordance with accounting standards, although under the possibility that the corrections of the tax will observe the income tax rules.

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## UNDERSTANDING LEARNING PROCESS: ACQUIRING NEW KNOWLEDGE THROUGH PLAY

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### ABSTRACT

*Contemporary research provides us with cumulative evidence that game playing supports active learning. Our goal is to build an aesthetically engaging video game for authentic problem solving and personal discovery that uses collaboration and competition as a setting for meaningful play. An engaged player will intellectually invest in the premise of a game if the challenge is designed to integrate uncertainty into goals that are obvious, compelling and adoptable. In games, the path for achieving goals is influenced by emotion. Players will be encouraged to create personal plots and stories by making unique choices. Narrative involvement inspires creative thinking by sparking fantasy and curiosity. The idea is to give players free movement within a rigid structure, where all components of choice and consequence are experientially relevant. This we envision in the form of an augmented reality (AR) platform based on iterative user-centered design that uses the logic of Knowledge based system (KBS). KBS algorithm will serve as a background for the learning syllabus. The concept of the game is structured on the topic of agroecology and inspired by Bruno Latour's hypothesis of the Terrestrial; attaching oneself to a particular patch of soil in one hand and having access to the global world in the other, shifting the tension between local and global axioms. Players will learn to cultivate their own AR gardens in a simulated environment and to be the guardians of natural resources and social cohesion. Our research should help us build a generic, multi-user environment for learning featuring inclusive play. We hope it will be useful to scholars in various disciplines but specifically in education.*

**Keywords:** Educational game, Knowledge-based system, Learning process

### 1. PROBLEM DEFINITION: LEARNING

As contemporary cultural products, video games embody important aspects of our society. Educational games such as Immune Attack (2019), Mingoville (2019) can be an effective way of motivating and engaging players by addressing different (medical, social, educational) issues. Jerome Bruner revealed the child "as an active problem-solver with his/her own way of making the sense of the world" (Barth, 2015, p.187). In other words, students prefer to construct their own knowledge by organizing and categorizing information, rather than being told by the teacher how to do it. Additionally, "to learn becomes learning to use a whole collection of cultural tools, that is, modes of thought, procedures and key concepts in each subject" (Barth, 2015, p.177). We learn by making choices (problem-solving) and through personal discovery. "One of the fundamental functions of play Bruner noted was "employing scenarios" or stories. His interest in how children construct their view of the world eventually led him to consider narrative as the primary way that we all constitute our experience of the world" (Madej, 2016,

p. 36). In video games the player crafts narrative combining actions, goals, and interpretations of the game's context. If the choices a player makes are affecting the narrative he becomes more immersed in the activity, and learning becomes seamless. Thomas Fuchs argues that perception, movement, and recognition are not, in principle, separable from one another. "All perception is based on the active recognition of gestalts that we have learned and that have become part of our implicit knowledge. Implicit know-how only becomes accessible in the process of action" (Fuchs, 2018, p. 145). At school, students' education is often geared towards standardized test outcomes which can mean the knowledge they acquire is inert and outdated outside the institutional context. In Hungary, we can see a decline in student's motivation and learning attitudes, especially in unpopular subjects (Füz, 2018). Video games as an active medium offer students space in which their implicit know-how can be employed in the process of action. Post experiential education, which is at the heart of a corporate university, can make two fundamental mistakes. The first is attempting to be a school; the second is not attempting to be a school. We may label this epoch the "bootstrap age" in reference to the stories of Baron Munchausen. "In the near future, this generation of the bootstrap age will step out from the schools, and some of them soon will become decision makers. It will be challenging to convince the decision makers of tomorrow to use of any kind of toolkit in their decision-making process" (Varga, Velencei, 2018, p.65). Therefore, the first part of the solution is to understand the learning process.

## **2. PROBLEM DEFINITION: GAME CONCEPT**

We are developing an educational game "Gaian" based on the concepts of Co-evolution and Terrestrial. It will use Augmented Reality (AR) technology and a decision support system. The goal is to inspire players to transform and build their environment in a mindful manner. By cultivating their virtual gardens the players will learn to implement beneficial long-term changes for the whole ecosystem. The main focus is to create an aesthetically engaging environment for making conceptually informed choices that result in collaboration, and intuitive learning. According to Hilmi "Nature does not care if we co-evolve well or badly and have to wear masks to protect ourselves from our own pollutions. In reality, we are not even co-evolving, as the term gives the idea of an evolution parallel to nature, we are evolving inside, within, as an intrinsic part of nature, we like it or not" (Hilmi, 2018, p. 9). Despite the existence of sustainable growth as a concept, paradigmatic shifts towards our relationship to the environment and issues like climate change are slow. We need to redefine dominant, but lacking, concepts in order to solve these complex issues. Bruno Latour frames the concept of Terrestrial to solve the faux tension between dominating axioms of global and local, progressive and regressive. The Terrestrial is bound to Earth and to land, but it is also a way of wording in that it aligns with no borders and transcends all identities. This is the sense in which it solves the problem of place we noted earlier: there is no Earth corresponding to the infinite horizon of the Global, but at the same time the Local is much too narrow, too shrunken, to accommodate the multiplicity of beings belonging to the terrestrial world. This is why the zoom lens that purported to align the Local and the Global as successive sightings along a single trajectory has never made any sense (Latour, 2018). We have conducted a number of interviews with gardeners that cultivate a mindful approach to gardening (permaculture, natural gardening, etc.) and understood that most of them do not side with a global or local worldview. Instead, they try to incorporate the positive sides of both in their approach. For example, one response was "I cultivate the soil locally, but I acquire knowledge globally". The goal of our game is to improve bio-literacy of the players and to educate about the importance of biodiversity.

### 3. AUGMENTED REALITY

We can define AR as a digital overlay on top of the real world. It is interactive in real time and registered in three dimensions. We are developing the video game for mobile devices, but AR can also be experienced through AR eyewear or a computer. Steve Aukstakalnis points out that gaming is “the present market segment holding the greatest potential and number of enthusiasts” (Aukstakalnis, 2016, p. 229). The size and profitability of the market has been the main driving force for advancement in GPU (graphics processing unit) performance. Simplicity is a key requirement in UI (user interface) design. It is essential that using gestures should feel intuitive and natural, and that users’ intent is transformed into action accurately and effortlessly. Required information should be immediately accessible and relevant to the user UX (user experience elements). Computer graphics, images, text, and audio should be immaculately integrated into the system. “AR technology traditionally works by tracking a target in the real world using a camera and software on an enabled device like a smartphone. These targets can include things like an icon, an image, an object, a sound, a location, or even a person. The target input data is processed by the software and compared against a database of potentially corresponding information. If there’s a match, an AR experience is triggered and content is superimposed on top of reality” (Papagiannis, 2017, p. 25). Players immerse in the game space easily if the user interface is instinctively understood. “Users who are not early adopters do not want to be dissuaded by complex gestures or motions to make the software work; rather, they should be able to instinctively understand how what they see works, as one does with a straw or a hammer” (Fox et al., 2018, p. 15).

### 4. RULES BEHIND GAIAN-GAME

What is the first thing a rookie is taught in the U.S. Navy? If it moves, salute, if it doesn't move, paint! The if-then rules reads differently when “if  $2 \times 2 = 4$  then  $4:2 = 2$ ”, than in, if it moves, salute, if it doesn't move, paint! Following the first, an axiom is verified, following the second the illustration is made about thinking model between the two events. ABPM (ambulatory blood pressure monitoring) measuring may verify something or not, but stories do not verify anything; it does not matter if you understand one’s mindset or not. It is important to understand some aggregation of if-then rules, for example, if we walk, then our blood pressure falls. The most basic rules of a mindset cannot be forgotten. Therefore, these if-then rules are stored in a person’s long term memory (LTM). We can never know in advance which rules will we employ from our LTM. In fact, it depends on the present functioning of our working memory (WM). If we use the capacity of our WM it is important to decide what to do, what to use or make use of. We use as many schemes as our WM allows – upwards from tens of thousands. An expert chooses data from each database (even in Excel) that he can use. “Effects on intellectual capacity would also depend on the extent to which the available selection power would be used for enhancing cognitive traits” (Bostrom, 2014, p. 58). If a knowledge engineer would like to model a decision maker’s mindset, she mines aspiration from only one decision maker. This is not teamwork. Maybe we can illustrate this better with Bostrom’s parable. “In some domains, quantity is a poor substitute for quality. One solitary genius working out of a cork-lined bedroom can write “In Search of Lost Time”. Could an equivalent master-piece be produced by recruiting an office building full of literary hacks?” (Bostrom, 2014. p. 77). In strategy games, learning consists of trying out the if-then rules. If a decision maker prefers, she can use if-then rules from the knowledge base or create new ones. A decision maker may redefine her mindset after the input of the new rules in the database. The essence of play is that the learning is shaped during the process. Ideas connected with if-then rules in time will construct its own learning model. Our game will use a Knowledge-driven (Hamad, Qader, 2014) type of Decision Support System. When we build a knowledge base for an initial decision, we put our aspirations in the form of a tree.



This is essential because 28 if-then rules among our aspirations cannot be retrieved from expert's LTM. "Our environment, the context of the decision, can only affect what is stored in our long-term memory (LTM). We retrieve what is in our LTM through the working memory (WM). Organizing our aspirations can be supported by an artificial intelligence (AI) algorithm. We developed a Knowledge-based System shell, namely Doctus KBS" (Velencei, 2019, p. 454). A Rule-based graph is created in a way that our aspirations are grouped so that if-then rules can be retrieved from an expert's LTM (Figure 1).

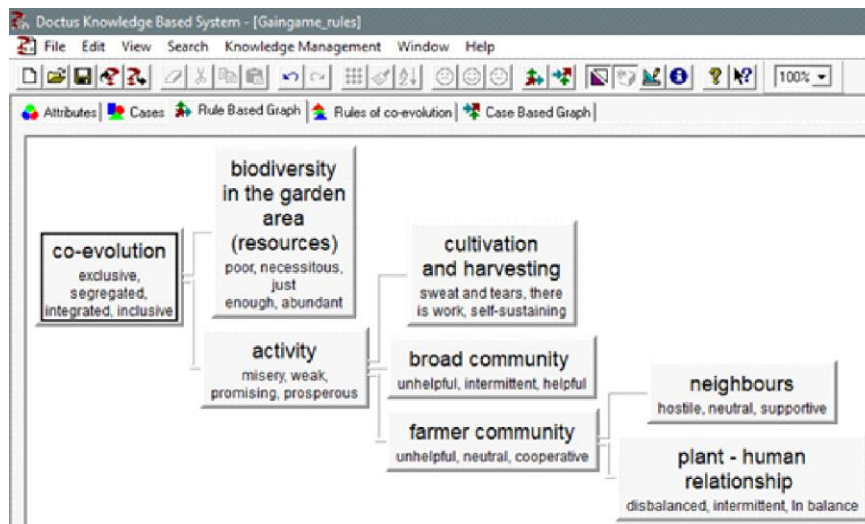


Figure 1: Attributes in Rule-based graph (Screenshot by authors)

A Doctus KBS algorithm creates complex rules from the rules input (Baracscai, Dörfler and Velencei, 2007). Let's see our case in Figure 2:

biodiversity in the garden area (resources)	activity	co-evolution
poor	.. weak	exclusive
.. necessitous	misery	exclusive
necessitous	weak .. proi	segregated
just enough ..	misery	segregated
poor	promising ..	segregated
just enough ..	weak	integrated
necessitous .. just enough	prosperous	integrated
just enough	weak ..	integrated
abundant	promising ..	inclusive

Figure 2: Complex Rules (Screenshot by authors)

We can read the complex rules from this window, for example in the first row:  
 IF biodiversity in the garden area is poor,  
 AND IF activities is weak or worst  
 THEN co-evolution is exclusive.

In the last row:  
 IF biodiversity in the garden area is abundant,

AND IF activity is promising or better  
THEN co-evolution is inclusive.

These rules aim to help a student as she plays the game. Decisions that a player has made can be examined and evaluated on the basis of expert and practitioner experience with recommended rules. Doctus KBS is capable of exporting knowledge bases in various forms of intelligent agents. Using the Knowledge Export feature the exported knowledge base can be made available to various users, who will be able to use it for evaluation, though they will not be able to modify it (Figure 3).

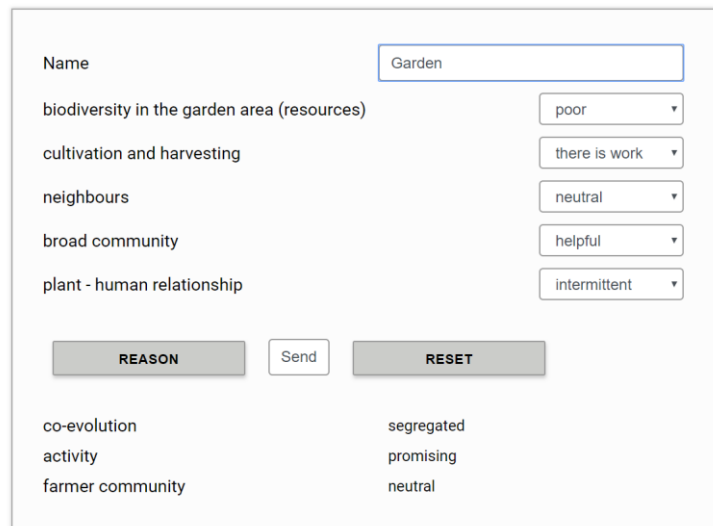


Figure 3: Knowledge export (Screenshot by authors)

Dynamic exported knowledge has reasoning capabilities. Doctus KBS generates a reasoning page in HTML to a server which is available to end users. On the server side, an SQL database will be created, which saves the answers automatically. This data will be used to sophisticate the knowledge base.

## 5. CONCLUSION

Our premise is that students' are motivated to learn if they are free to make choices about what and when they want to learn. Learning processes during play are especially enhanced if a player chooses the pace. Aesthetics play an important role in students' cognition and collaboration. These are some of the reasons why video games are such a dominant medium among youth. Active and seamless learning that occurs during play happens mostly outside of school and in informal ways. We are developing the Gaian video game with a focus on increasing the bio-literacy among students'. We hope the game will inspire a mindful approach to their surroundings and that it will contribute to a paradigm shift in the way they connect to the Earth.

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## UNDERSTANDING DISHONEST BEHAVIOR IN ORGANIZATIONS

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### ABSTRACT

*This paper proposes a new conceptual framework for studying dishonest behavior in organizations. Research in this area often leads to misguided interpretations of how dishonest behavioral patterns are formed and maintained in organizations, and it is argued here that this may be the result of a mechanistic-reductionist approach. The problem of such an approach lies in the epistemic foundations, since both inductive and deductive methods may be used in a way that they lead to fallacious conclusions. Abduction, however, allows us to make sense of diverse and complex experiences and thus it is used as the basic guiding logic in this paper. The framework proposed in this paper is built on a transdisciplinary approach, meaning that it takes into account the holistic nature of the topic, and transgresses disciplinary boundaries to address a societal problem, where there is uncertainty not only about the potential solutions, but about the nature of the problem itself. The conceptual framework relies on three main pillars: complexity, sensemaking and organizational culture. To understand dishonest behavior in organizations, the organization needs to be studied as a complex system with emergent behavioral patterns, such as habits. These patterns cannot be understood, if individuals are studied in isolation, because they are formed as a result of how people make sense of the organization and their role in it. The organizational culture is a construct of this sensemaking, as it is created by the behavior of the individual members, but as a whole, also affects behavior in many ways, for example by placing a certain level of relative cost on ethical behavior. The proposed framework can serve as a starting point for designing and evaluating empirical research on dishonest behavior in organizations and thus contributes to the process of moving towards a more honest environment in organizations.*

**Keywords:** *complexity, dishonest behavior, organizational culture, sensemaking, transdisciplinary approach*

### 1. INTRODUCTION

Amaryta Sen has argued that ethical considerations in economics and business have been undeservedly neglected since the birth of what is considered to be classical economics (Sen, 1993, 2003). This is perhaps best exemplified by the so called Friedman doctrine, that states that the business of business is business (Friedman, 1970). Despite this, in the last two to three decades there has been a growing interest in the academic literature about concerns of ethicality in business, and one of the extensively researched topics in this domain is dishonest behavior in organizations. However, there is no established paradigm under which these research efforts operate, one can find a plethora of methods and approaches to even formulating questions, let alone finding answers and conclusions (see for example The Journal of Business Ethics, or Organizational Behavior and Human Decision Processes). It can be inferred from this, that in the typology of Kuhn (1970) this field is in a preparadigm period. It is discussed in this paper, how one can go about understanding dishonest behavior in organizations, and a starting point in this discussion is how dishonest behavior is defined. First of all, the terms dishonest and unethical behavior are used interchangeably throughout the paper, accepting the fact that a small set of dishonest behavior might not be unethical by certain standards (e.g. white lies) and some actions that are considered unethical may not be dishonest (e.g. being openly rude to someone). But how can dishonest and unethical conduct be defined exactly? Philosophers have argued about this for millennia, and it is out of the scope of this paper to take a side in such a debate.

The approach of Bazerman and Tenbrunsel is followed (Bazerman and Tenbrunsel, 2011) and a clear definition on what is objectively considered as unethical behavior is avoided, instead the focus is on patterns of behavior that are inarguably perceived as dishonest and unethical by any impartial observer. The purpose of this paper is to propose a conceptual framework for understanding how dishonest behavioral patterns are formed and maintained in organizations. It is suggested here that two of the main reasons for the prevalence of dishonesty in organizations are that (i) members tend to misinterpret the reasons why certain other members of the organization engage in unethical behavior and (ii) members who want to act against such behavior choose ineffective or even counterproductive ways to do so. By offering a different framework to understand dishonesty in organizations, this paper aims to contribute to addressing these issues.

## **2. EPISTEMIC FOUNDATIONS**

In this section the epistemic foundations of this paper are described, and the concept of a transdisciplinary approach is introduced. A difference of such an approach compared to the mainstream view in science, including the social sciences is outlined. C. S. Peirce was among the first great thinkers in modern times to propose an epistemic view that is in sharp contrast with the reductionist approach to science that has dominated the academic world since Galileo (Davis, 1972). His conclusion that the cartesian mechanistic world view is incomplete, and the classical way of scientific enquiry is far from being the only or the best way to understand the world we live in was way ahead of his time. Karl Popper also criticized the mainstream approach to scientific research, arguing that the logic which is used for obtaining scientific theories is fundamentally flawed (Popper, 2005). He states that using induction to arrive to definite or even probable conclusions about truth is inappropriate and that only deductive reasoning can and should be used when testing theories. Inductive reasoning is based on the observation of particular instances, and inferring probable conclusions, whose trueness is made more likely by increasing the number of instances observed in line with the conclusion, but the conclusion is never undoubtedly proven this way (Russel, 2016). Russel provides an illustrative example of this through a chicken that is regularly fed by a person, being lulled into the inductively acquired belief that seeing that person will always mean food. This belief will prove to be correct up to the point when the person comes with a knife and cuts the throat of the chicken. Deduction represents the process of arriving to a general conclusion from premises that are usually also general in their nature. For the conclusion to be true, it is necessary that the premises are also true. The most often used example of deductive reasoning is the following: All men are mortal; Socrates is a man; therefore, Socrates is mortal. However, Russel points out that using deduction in cases such as this famous example does not necessarily yield new knowledge, since the premises are based on empirical generalizations (Russel, 2016). He argues that deductive reasoning should be reserved for propositions known a priori, such as two and two are four. Both induction and deduction are used for testing ideas that somehow already came to exist. How these ideas are formed can be described by abduction, a method of logical reasoning whose conception is attributed to Peirce (Davis, 1972). Peirce suggested that abduction is a more basic form of reasoning than deduction and induction, because it is "the creative act of making up explanatory hypotheses" (Davis, 1972 p. 22). He points out that abduction is distinct from induction in that it allows us to make sense of diverse and complex experiences while induction usually only allows us to infer facts from observations that are of the same kind. Once we arrive to abduction, we inevitably introduce some level of subjectivity into the scientific discourse. Brier (2008) provides a comprehensive list of what has been attained by the philosophy of science in the last century, from which a few elements are highlighted that point specifically to the involvement of subjectivity: "No facts are absolutely free of context. (...)"

The scientific theories accepted at present are not the final truth about the world or reality, but they do show complementary parts of reality. (...) Complexity will always leave room open for further interpretation. Nevertheless, we have to strive for compatibility between the various forms of reason. (...) Science is an important part of the collective art of arriving at good reasons to believe strongly in something that is, it is a procedure for producing socially reliable knowledge" (Brier, 2008 p 8-12.). The idea of transdisciplinarity as outlined by Nicolescu (2002) is built on an epistemic stance that embraces subjectivity at its core. He describes how quantum physics has shaken even the most basic principles of what we know about reality by questioning the axioms of classical logic, namely the axioms of identity ( $A$  is  $A$ ), the axiom of noncontradiction ( $A$  is not non- $A$ ) and the axiom of the excluded middle (there exists no third term  $T$ , which is at the same time  $A$  and non- $A$ ) (Nicolescu, 2002 p. 25). Nicolescu introduces the concept of multiple levels of reality and suggests that the classical axioms are only valid if we look at a single level of reality, but in multiple levels of reality an included third ( $T$ ) may exist which is at the same time  $A$  and non- $A$ . In a social scientific context this can be translated into different levels of reality where the current problem is to be located, such as the level of the individual, the level of the organization or the level of the society. This paper focuses on the level of the organization. When describing the nature of transdisciplinary research, Hirsch Hadorn et al. (2008) point out that scientific research is becoming an integral part of even the most practical parts of everyday lives, but the fragmentation of scientific knowledge makes it difficult to tackle large scale problems of the life-world. The concept of life-world (also often used with the original German term "Lebenswelt") is a concept defined by Edmund Husserl that refers to the world of immediate experience that is pretheoretical, as it underlies all theoretical interpretations of the world that we sense around ourselves (Husserl and Carr, 1984). Transdisciplinarity emerged as a way to address the gap between monodisciplinary knowledge creation in academia and the demand for complex knowledge to solve societal problems. In order to achieve this, it is necessary to transgress boundaries between disciplines and even between academic and non-academic realms. According to Hirsch Hadorn et al., (2008), transdisciplinary research should be used when there is uncertainty not only about the potential solutions to a problem, but about the nature of the problem itself. Based on this idea, they define the following goals for transdisciplinary research: "to grasp the complexity of the problems, to take into account the diversity of scientific and societal views of the problems, to link abstract and case specific knowledge, and to constitute knowledge with a focus on problem-solving for what is perceived to be the common good" (Hirsch Hadorn et al., 2008 p. 35). A transdisciplinary approach is used along these lines in this paper, since the problem of dishonesty in organizations fits exactly into the description provided above.

### **3. A CONCEPTUAL FRAMEWORK**

In this section a theoretical framework is proposed for understanding dishonest behavior in organizations. The concepts of organizational culture, sensemaking and complexity are introduced as the main pillars of the framework.

#### **3.1. Complexity**

According to Baracscai, (1997), when studying human behavior in organizations, one can build on three different schools of thought: (i) the Platonic idea of understanding phenomena in a mechanistic approach, where events are simple and rational, governed by general laws; (ii) the Aristotelian vitalist approach which uses living organisms as an analogy for describing a wide range of phenomena; and (iii) a third view of the world which is based on systems theory and describes organizational phenomena in terms of their capabilities to interact with their environment in a way that allows them to survive. The categorization of organizational studies by Scott (2003) is very much in line with this triad.

He defines three major schools of thought in this field: (i) one that defines the organization as a rational system, with preset goals and formalized structures; (ii) one, in which the organization is depicted as a natural system emphasizing the role of social consensus and social conflict that create formal and informal structures; and (iii) one that describes the organization as an open system built up from the complex relation of interdependent activities. Important contributions had been provided to organizational studies by both the mechanistic-rational and the vitalist-natural schools, but neither of them was able to supply solid scientific theories for understanding complex, emergent phenomena. It was Ludwig von Bertalanffy's (1969) general systems theory that addressed this issue, and provided the basis for a new understanding of organizations. General systems theory is built on the idea, that systems in different levels of organization have structural similarities or isomorphism, i.e. certain patterns of behavior exhibited by a cell, by a plant or by a firm can be studied using the same modelling logic (Bertalanffy, 1969). Complexity and emergence are fundamental concepts in systems theory (Bar-Yam, 1997). According to Bar-Yam, complexity is the amount of information needed to describe a system on a certain scale, and emergence refers to the property of complex systems that the collective behavior of its parts can only be understood in the context of the whole systems, but not in isolation. Anderson (Anderson, 1999) provides an overview on how these concepts have been applied in modelling organizational problems. Studies of dishonesty in organizations, however, are usually not conducted with this approach, but with a reductionist one, where the behavior of agents is studied in isolation, but the conclusions drawn refer to their behavior in the organization (e.g. Rilke et al., 2016; Wang, et al., 2014)). While these studies can certainly provide useful insights, they might also lead to incomplete or inadequate conclusions in complex organizational settings. They may infer that since a certain regularity in dishonest behavior has been observed during an experiment, this regularity will be observable in the organization as well. However, this may not be the case at all, if the studied premises leading to the conclusion are different in nature within the organization due to its complexity – the abundance of information required to describe the workings of the system. This shows that linear models such as the theory of planned behavior (Ajzen, 1991) do not lead to a comprehensive understanding of human behavior. This is exemplified by an increasing body of behavioral ethics research pointing out that behavior in terms of ethicality is just severely inconsistent and subject to ethical blind spots (Sezer et al., 2015), which are the results of bounded awareness and bounded ethicality (Bazerman and Sezer, 2016). These terms are based on the idea of Simon on bounded rationality (Simon, 1997), the latter referring to the limited capacity of human beings to make rational choices while the former two to the same in the domain of perception and moral judgement. Kahneman (2011) realized that this bounded nature of human capabilities often results in biases and fallacies, and he provides a way to interpret such biases through a dual process model of cognition. In his model, the human mind can be understood as a composition of two different systems: (i) system 1 which serves as the default operator, it allows people to give quick reactions to the environment, make judgements and decisions in the matter of milliseconds and do all this in a relatively effortless manner; while (ii) system 2 is the driver of reason that is able to construct abstract thought, make rational decisions and engage in other mentally resource intensive processes. These systems do not exist separately from each other in a material sense, they serve as a model of how human behavior can be understood. Ariely (2013) discusses in great detail how the workings of system 1 makes people susceptible to predictable errors in several areas of life, including moral judgement. He contrasts this view with the established approach of the rational choice theory as described by Gary Becker (Becker and Landes, 1974). Becker's model postulates that dishonest behavior is the result of a conscious cost benefit analysis relying on three factors: the expected benefit of the behavior, the expected cost (if caught) and the probability of being caught. Ariely argues that dishonest behavior is not the result of conscious cost-benefit analysis; such behavior is

most often impulsive, and its prevalence is dependent on complex social and psychological factors. His experiments also provide empirical evidence to the fact, that contrary to popular belief, dishonest behavior in a group cannot be attributed to “a few bad apples”, but that in such groups most of the members cheat a little bit (Gino et al., 2009; Mazar et al., 2008). This is important, because it shifts our focus from a few prominent cases of dishonesty to smaller ones that are perhaps more often repeated. When a behavior is often repeated, actions are stored in memory in association with situational or environmental cues and therefore the actions can be activated automatically by the cues, and this leads to the formation of habits (Aarts et al., 1998). Thus, future decisions on behavior in similar situations will be primarily guided by habits and not by conscious reasoning. Such habits can be understood as patterns that form the organizational culture.

### **3.2. Organizational Culture**

Organizational culture is defined by Schein as “a pattern of shared basic assumptions learned by a group as it solved its problems of external adaptation and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems” (Schein, 2010 p. 18). In Schein’s model the organizational culture consists of three levels: (i) artifacts which are the visible elements, such as observable behaviors; (ii) espoused beliefs and values which are openly expressed by the members of the organization; and (iii) basic underlying assumptions that are often unconscious and are the true determinants of behavior within the organization (Schein, 2010). The difficulty of observing and understanding these levels is increasing in the same order as they are listed above, but acquaintance with the deeper levels provides a better opportunity to understand dishonest behavior in the organization. Zsolnai (2013) proposes two main factors that can impact behavior in terms of ethicality: (i) the moral character of the agents and; (ii) the relative cost of ethical behavior. He presents these factors in terms of national economies, but this can be used to understand how the interplay of the organizational culture and the moral background of the individual make it easy or difficult to act unethically. If the individual has a strong moral character and is part of an organization where the culture provides a low relative cost of ethical behavior, then behavior in general is expected to be ethical. On the other hand, if the moral character of the individual is weak, and the organizational culture places a high relative cost on ethical behavior, unethical behavior is likely to be common. The two other combinations, a strong moral character in an environment where the relative cost of ethical behavior is low, and a weak moral character in an environment with high relative cost of ethical behavior are perhaps even more interesting. By understanding how the different levels of organizational culture contribute to the relative cost of ethical behavior, we can gain a good understanding of the underlying factors that need to be addressed, if behavior is to be improved towards a more ethical and honest standard. These elements of the organization culture, however, cannot be captured as deterministic laws or probabilistic cause-effect relations. They are a result of how individuals make sense of the organization.

### **3.3. Sensemaking**

Sensemaking in this paper is used as outlined by Weick (1995). He highlights that sensemaking is grounded in identity construction, meaning that the self who is doing the sensemaking is not constant, but is also changing through this process. Sensemaking is an abductive process that is triggered by cues in the environment that are noticed because they violate some expectation and result in an activity that aims to synthesize the experienced reality with the existing patterns in the mind. Sensemaking therefore is related to dissonance theory (Weick, 1995). When confronted with the questions of ethicality and dishonesty, individuals may often experience cognitive dissonance (Festinger, 2001).

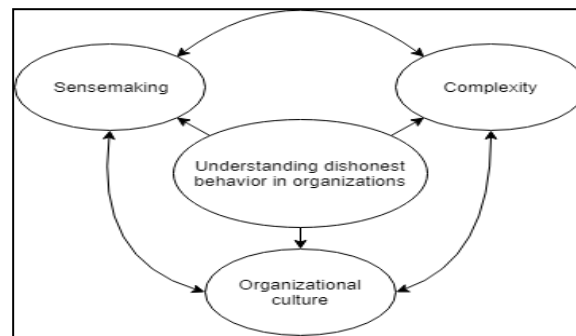


This is manifested the following way: one commits an act that is dishonest or unethical but still wants to see oneself as an honest, ethical person. The individual is motivated to reduce cognitive dissonance, since it is psychologically uncomfortable, and therefore one might change the cognitive elements representing the environmental factors, for example by changing beliefs about what is accepted behavior in an organization. One might also seek to add new cognitions that can synthesize the previously dissonant elements or change the importance of the elements, for example, by starting to concentrate on how dishonestly some others have behaved. Cognitive dissonance caused by unethical behavior may be pre-empted by moral disengagement (Bandura, 2016). Moral disengagement refers to a set of mechanisms which allow otherwise decent individuals with high moral standards to selectively disengage from their self-restraining and self-sanctioning cognitive processes. The mechanisms operate at (i) the behavior locus, by providing moral justifications, euphemistic labelling and advantageous comparisons; (ii) the agency locus by the displacement and diffusion of responsibility; (iii) the outcome locus by minimizing, ignoring or misconstruing the consequences; and (iv) the victim locus by dehumanization of the victims and attribution of blame to them. Bandura also highlights, however, that moral disengagement is not only an intrapersonal matter, since it is a complex synthesis of individual and interpersonal factors that trigger the aforementioned mechanisms. As he puts it, "a group operates through the behavior of its members. However, a group's belief is not simply the sum of the individual members' beliefs. Interactivity produces emergent effects" (Bandura, 2016 p. 13). This leads back to how making sense of the ethicality of organizational behavior is determined by an interplay of individuals as part of a system. Weick (1995) suggests that sensemaking in organizations can be studied if we define the organization as an open system, relying on negotiated goals and structures, highly contingent on environmental factors. Boulding (1956) identified a typology of systems, consisting of nine levels with increasing level of complexity:

1. Frameworks: mappings of static structures, such as an actual geographic map.
2. Clockworks: simple dynamic systems with predetermined necessary motions, such as a steam engine.
3. Cybernetic systems: systems that have simple interaction with their environment in order achieve their equilibrium, such as a thermostat.
4. Open systems: self-maintaining systems that are capable changing their throughput in relation to their environments, such as cells.
5. Blueprinted growth systems: systems that are capable of reproduction and growth with the help of differentiated and mutually dependent parts, such as plants.
6. Internal-image systems: systems that process incoming information in relation to an existing knowledge structure or image, such as animals
7. Symbol-processing systems: systems that are capable of processing abstract symbols and arrive to self-consciousness, such as human beings
8. Social systems: systems that are comprised of self-conscious members, such as organizations
9. Transcendental systems: systems whose structure is unknowable, such as the universe as a whole

Boulding's paper is, as of this writing, more than fifty years old, but several of his main conclusions are still valid and relevant, especially that most theoretical accomplishments related to organizations are reflective of a system on the second or third level at best, whereas the subject matter of these theories are humans and organizations that belong to the seventh and eighth levels. An important, but rather counterintuitive characteristic of higher level systems, such as organizations is that the rules that govern the behavior of its agents (in this case people) are not predetermined, like mechanical laws, but are often inferred after-the-fact, as part of

making sense of that behavior (Weick, 1995). To understand dishonest behavior in organizations, the organization needs to be studied as a complex system with emergent behavioral patterns, such as habits. These patterns cannot be understood, if individuals are studied in isolation, because they are formed as a result of how people make sense of the organization and their role in it. The organizational culture is a construct of this sensemaking, as it is created by the behavior of the individual members, but as a whole, also affects behavior in many ways, for example by placing a certain level of relative cost on ethical behavior. The relations proposed in this framework are illustrated on Figure 1 below.



*Figure 1: Illustration of the framework proposed for understanding dishonest behavior in organizations*

#### **4. APPLICATION OF THE FRAMEWORK**

In this section a potential use of this framework is suggested for designing and evaluating empirical research. When designing empirical research in this framework, one certainly has to acknowledge the organization at hand as a complex system. One should start with observing the relationships and processes that form the system, and for this the informal elements, such as personal relationships between the members of the organization are at least as important as (or perhaps even more important than) the formal ones, such as codified rules and regulations, work instructions or organizational charts. This is in contrast to a reductionist approach, where one would try to isolate a few elements that are supposedly relevant to dishonest behavior, analyze it in isolation, and then arrive to a conclusion that can be “inserted” back into the organization. With this approach, however, one would aim to acquire a picture of the organization as a whole and understand how dishonest behavior is integrated into the system. For this, one would start to explore the levels of the organizational culture, especially in relation to dishonest behavior, and this is already difficult at the first level of artifacts and becomes even more so on the following levels. The first of many difficulties is to decide who is really able to do this kind of research. If this is done by an external observer, then it will be very difficult to observe dishonest behavior in its “natural way”, because when people are aware of being observed, they will certainly change their behavior to avoid being seen as dishonest. On the other hand, if the observation is done by an individual who is an integral part of the organization, it may lead to a very much distorted view, as his or her views on what counts as dishonest or unethical might be extensively biased, especially in relation to people who are his or her acquaintances. The solution must lie somewhere in the middle, such as an employee who has joined the organization recently, thus is not so much influenced by the underlying elements of the culture but is already well acquainted with the organization in general, or a consultant who is not only supposed to perform a specific task, but is expected to provide help in a complex situation and has a greater level of involvement in the organization (this is called clinical research by Schein, (2010)). However, it is suggested here that there is no perfect solution to this problem, since such a research will certainly err in one direction or the other – either by not being involved enough or by being involved too much.

Once there are observations and data about artifacts, the next step is looking at the second level of espoused beliefs. This is where one aims to understand how people make sense of dishonest behavior in the organization. One should aim to answer questions, such as “What forms of dishonest behavior are noticed and result in sensemaking activity?”; “What discussions are prompted by dishonest behavior?”; “What forms of dishonest behavior are seen as acceptable or understandable in some way?”. The research at this level is likely to identify elements of inconsistencies between espoused values and actual behavior that can be identified as ethical blind spots. Dissonance, or attempts to its reduction may also be observed. Based on these, one may also find occurrences where the rule that was supposed to govern the behavior of the actors was actually constructed after the behavior. After this, one should try to formulate hypotheses about the basic underlying assumptions on dishonesty in the organization. This is where the role of abductive thinking comes into play, since these hypotheses will not be conclusions drawn from undeniable true premises (deduction), or probabilistic statements based on observing large samples of data that are of the same kind (induction). The formulation of these hypotheses will require creativity, reflective thinking (Dewey, 1910) and meta-knowledge as described by Baracskaï and Dörfler (2017). These can then be tested by gathering more data about observable dishonest behaviors and declared beliefs about those behaviors and assessing the consistency of the newly observed data with the proposed hypotheses.

## 5. CONSLUSION

Dishonest behavior is as old as our species, perhaps even older, and has been studied since the beginnings of civilization. Dishonest behavior in organizations hinders the ability of the organizations to function properly, therefore it is usually attempted to eliminate or contain it. However, most of the research that investigates this issue does not take into account its complexity and uses a reductionist approach to create models and test hypotheses. This paper has proposed a conceptual framework to understand dishonest behavior relying on the principles of general systems theory and applying the concepts of organizational culture and sensemaking. The framework can serve as a starting point for designing and evaluating empirical research and thus contribute to the process of moving towards a more honest and ethical environment in organizations.

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## EFFECTS OF NPO PROFESSIONALIZATION: EXPLORING THE ROLE OF FOUNDATION FUNDING

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### ABSTRACT

*Civil society around the world has undergone significant changes over the past few decades. Mass voluntary organisations focused on mayor political or charity issues of the past are today becoming a prolonged hand of the state that helps solve specific societal issues. These changes have influenced non profit organizations in a number of ways. Due to the ever growing governmental and public scrutiny non profit organizations are required to be ever more transparent and are required to justify their purpose and especially their budgets coming from public sources. Various foundations played an important role as mayor founders of NPO's but there are still ambiguous findings regarding the effects foundation funding has on NPO's. In order to shed light on this understudied issue we analysed the Croatian Foundation for Civil Society Development that operates in an interesting empirical setting of a former socialist country that has in the meantime become the newest member of the European Union.*

**Keywords:** *non profit organizations, foundation funding, professionalization, Croatia*

### 1. INTRODUCTION

This paper explores the implications of 'foundation funding' on the behaviour of non-profit organizations through a case study of the Croatian Foundation for Civil Society Development. Over the past decades, the civil sector in Europe has undergone significant changes. New government policies have led to non-profit organization (NPO's) providing more services than ever before, while at the same time meeting stricter transparency requirements (Enjolras, 2009). This has resulted in a widespread professionalization of NPO's. The causes of professionalization are well established in the literature. However, findings regarding the effects of professionalization on NPO's are still ambiguous (Maier et al., 2016). A crucial change in terms of NPO funding, has been the establishment of national foundations for civil society development. These foundations offer project and institutional funding aimed at achieving policy goals and strengthening NPO's. Their activity has also led to a change in practices and mind-sets in NPO's, making them more professionalized (Hwang & Powell, 2009). A number of authors have proposed that professionalization, among other effects may lead to mission drifting (Bailis, et al., 2009; Keevers, et al. 2012). This implies that foundation funding influences NPO professionalization as well as the effects related to professionalization. National foundations for civil society development can therefore be viewed as drivers of professionalization in NPO's. However, we still lack knowledge on how this process occurs and what effects professionalization has on NPO's. This paper is also a response to a call for case studies to examine if "NPO's involvement in advocacy, political mobilization, or community engagement is dampened by widespread adoption of evaluative metrics" (Hwang

& Powell, 2009). In addition, it offers a more comprehensive and evidence based understanding of the impact that professionalization has on NPO's.

## **2. THEORETICAL BACKGROUND**

### **2.1. Changing face – professionalization of civil sector**

The civil society in Europe has undergone an important transition in the past few decades. A shift in public policy influenced this transition. Traditionally, the government provided most of the welfare state services and civil sector was embedded in policy making related to these services. Voluntary organizations interacted with the political and economic system and were involved in planning as well as delivery and supervision of social services (Wijkstrom, 2011). This also meant that civil sector organizations had an important political presence and could therefore rely on government funding for their work. However, in contemporary societies a number of significant changes in public governance have taken place. On one hand, governments want NPO's to take greater part in provision of social services while on the other, both the government and the public demand a greater level of transparency. Civil sector funding has become dependent on proclaimed strategies of the public sector and related funding procedures. This led to a significant rise of pressure on the civil sector organizations in terms of needing to present detailed reports of their work and produce measurable outputs. It can be said that social services have therefore become subject to a quasi-market governance (Enjolras, 2009). According to Kaufmann (2000), "there seems to be less state, more market and more civil society" in this new paradigm. In order to provide individualized social services to a wider array of users, governments tend to fund the civil sector through flexible short term and project oriented contracts. Roche (2004) identified the described shift as a "culture of short-termism in policy provision". Therefore, third sector organizations now have irregular and scattered funding opportunities (Bode, 2003). It can be stated that relationship between civil and public sector has become disorganized in a sense that they now interact on unstable grounds due to programme shifts and short-term funding (Bode et al., 2006). An important consequence of this change is the diminishing of NPO's political strength. In order to cope with the above-mentioned changes, NPO's tend to become more professionalized and are turning towards public relations and political campaigning in order to legitimize their work (Bode et al., 2006). According to a literature review by Maier et al. (2016) NPO's are becoming professionalized through their organization, goals and rhetoric. Today, we know a lot about the causes of NPO's becoming professionalized. Maier et al. (2016) identify exogenous and endogenous causes, as well as the causes at organization and environment interface. Exogenous causes are drivers of business like approaches that are present in the organization's environment, such as "discourses and ideologies, conditions in politics, the economy and civil society, as well as collective and individual actors". Endogenous causes vary from "board characteristics (Stone, 1989), organizational culture (e.g., Choi, 2012), ideologies (e.g., Meinhard & Foster, 2003), field of activity (e.g., Enjolras, 2002) and member or public orientation (Quarter et al. 2001)" (from Maier et al., 2016). When it comes to causes for NPO's becoming business like at the interface between the organization and the environment, Maier et al. (2016) explain that rationalist and institutionalist approaches have been most commonly used in explaining how NPO's respond to environmental conditions. Rational theory states that NPO's deliberately chose to become more business-like as a strategic choice, while institutional theory states that the interaction between public sector, economy and NPO's influences NPO's becoming more business-like.

### **2.2. Effects of professionalization**

Another important research area of studying NPO's are the effects of them becoming 'business-like'. Effects of NPO's becoming 'business-like' have been addressed in four research areas: organizational performance, NPO's fulfilment of societal functions; power, knowledge and

subjectivities; and NPO's legitimacy (Maier et al., 2016.). Organizational performance is closely linked to the fulfilment of NPO's societal functions, and it can be seen through mission achievement and securing resources for organizational survival (Maier et al., 2016). When it comes to professionalization influence on organizational performance the findings are ambiguous. It would seem that e.g. market orientation has a positive influence on organizational performance but the same cannot be said for commercialization or entrepreneurial orientation. Research on the effects of professionalization on NPO's has given inconclusive results so far. Some authors claim that professionalization positively influences organizational performance of NPO's and therefore helps them to achieve their missions more easily, while others claim that business like approaches in NPO's cause drifting from community building and advocacy toward service delivery (Maier et al., 2016). According to Skocpol (2003) professionalization could lead to diminished experimentation of NPO's that in the past helped promote democracy, solidarity and other important societal goals. It could also lead to NPO's doing services only for others rather than with them. Some authors also fear that greater professionalization could lead to dominance of instrumental orientations at the expense of expressive goals (Frumkin, 2002; Skocpol, 2003; Putnam, 2007). Similar findings can be found in Jenkins (1998), who, based on institutional theory, explains how the professionalization of NPO's has shown to lead to successes in a prescribed manor and channels NPO's towards more moderate goals and tactics. Professionalization could potentially lead to significant shifts in both mission and structure (Minkoff & Powell, 2006). Professionalization in NPO's is a direct consequence of changes that have taken place in contemporary public policies. Hwang and Powell (2009) have stated that foundations have a profound impact on NPO's not so much because of the funds they provide but because those funds bring particular mind-sets and practices with them. "Grants contain requirements for strategic plans and evaluations, have a budget for hiring consultants, and stipulate that executive directors and board members attend management training sessions. Foundations are playing a critical role as carriers of modernity in the non-profit field, rendering a heterogeneous mix of organizations more similar." One of the aims of this paper is to qualitatively explore the influence of foundation funding on the fulfilment of NPO's proclaimed missions. Previous research has shown us that foundation funding leads to professionalization, and that professionalization may lead to mission drifting, as well as some other outcomes in NPO's. (e.g. Wijkström, 2011) However, we still lack insights into how this process occurs. In order to shed a light on the issues mentioned, main questions this study addresses are:

- How does professionalization of NPO's unfold, and what is the role of Foundation funding in this process?
- What are the effects of NPO's becoming professionalized in terms of their mission and activities?

### **3. RESEARCH SETTING AND METHOD**

#### **3.1. Research setting and context**

Post socialist countries with a legacy of centrally planned economy serve as an interesting empirical setting for the study of organizational practices in the civil sector. Unlike their Western European counterparts, in these countries NPO's are still a relatively new type of organizations. With the fall of the Berlin wall and a transition of these countries to a market economy, NPO's were developed in order to help promote democracy and build the pillars of the future civil society. In this period, these organizations were primarily funded from external organizations (Amnesty International, Open Society, etc.) that promote development of democracy and human rights in developing economies. In the meantime, a number of these countries have become members of the European Union and have adopted a similar quasi-market governance paradigm towards the civil sector (Enjolras, 2009).



This shift has significantly reinforced the role of national foundations for the development of civil society, making them one of the main sources of project funding for NPO's. This paper aims to explore what are the effects of foundation funding on NPO's and how these effects influence NPO's by using the case of the Croatian civil sector and the Croatian National Foundation for Civil Society Development. Croatia serves as an interesting empirical setting due to the fact that it is a post-socialist economy and that is the last country to join the EU.

### **3.2. National Foundation for Civil Society Development**

The National Foundation for Civil Society Development is a public foundation founded by the Republic of Croatia by a special act passed by the Croatian Parliament. It is funded through income from the national lottery and the state budget. Other than that, the Foundation receives donations from domestic and foreign physical and legal persons and generates income from its own activities. A nine-member management board manages the Foundation. Three representatives come from the bodies of state administration (The Ministry of Finance, the Ministry for European Integration and the Ministry of Science, Education and Sport), one representative is named by the local and regional self-government and five representatives come from organizations and experts within the civil society. The aim of the foundation is to promote and develop the civil society in the Republic of Croatia. In order to do so, the Foundation offers expert and financial support to programs which encourage the sustainability of the not-for-profit sector, inter-sector cooperation, civil initiatives, philanthropy, voluntary work, and which improve the democratic institutions of society and other programs which fulfil the basic aims of the Foundation. The foundation collaborates with NPO's in a number of different ways. It prepares and organizes education for the members of the civil society, it offers expert and advisory services, it funds research on civil society development and builds regional and local decentralized structures in order to help civil society development. However, the most visible way in which the Foundation helps NPO's is providing financial support for their programs and projects. The National Foundation for Civil Society Development has financed 394 programmes with 615 NPO's involved in 2016. More than 16 000 volunteers participated in the programmes and they resulted with more than a 1000 new employees in the civil sector. When analysing the Foundation and its role in civil society, a parallel with innovation management literature can be drawn. Giudici et al. (2017) define open-system orchestrators as organizations that support decentralized and mostly independent entrepreneurial efforts of the members of their networks. The admission to these networks is open and revolves around network-specific criteria that members need to meet in order to join them. Still, participation is voluntary and based on organization's needs. The relationship between the Foundation and the NPO's can be seen in this way as well.

#### *3.2.1. Data collection and analysis*

##### *3.2.1.1. Sample of interviewees*

In order to gain best possible insights into effects of the Foundation activities on NPO's in Croatia, the sample of interviewees consisted of three top executives within the Foundation. The Chairperson and two vice Chairpersons. Two of them have been employed in the Foundation from its founding in 2003 (Chairperson and one vice Chairperson) while the third interviewee has been employed in 2017 but has had a significant tenure in the civil society prior to joining the Foundation.

##### *3.2.1.2. Interviews*

The interviews were semi structured and focused on the effects that Foundation funding has had on NPO's over the past fifteen years. Interviews were conducted in Croatian since the authors are fully fluent in the native language. Two of the interviews were conducted in person

and one on telephone. All of the interviews were recorded and later transcribed and sent for the respondents approval. The interviews took place in May and June 2018.

#### *3.2.1.3. Archive analysis*

In order to gain better insights and evaluate responses from the interviews, all publicly available data regarding the activities of the Foundation from 2003 – 2018 was collected. Being a public organization that allocates funds to NPO's the foundation published very detailed yearly reports that explained and detail all the activities undertaken by the foundation as well as providing a detailed financial reports on all of the activities.

In addition to that, the dataset consists of a large archive of project proposals, financial reports and mission statements of Croatian NPO's over a fifteen-year period, including more than 700 project proposals, financial statements, mission statements and project financial reports for more than 500 NPO's. The data has been collected from the Croatian Financial Agency, the National registry of Non-profit Organizations and the Croatian foundation for civil society development. Following the guidelines proposed by Glaser et al. (1968), Yin (1994), Eisenhardt (1989) our research method will follow a combination of a grounded theory approach and comparative case study. Such a method implies that a continuous comparison of data and theory was applied. In order to strengthen the grounding of theory and assemble a synergistic view of evidence, the data will include numerous sources. Due to the fact that initial analysis consists of more than 500 cases in order to create a comparative case study, a number of extreme situations and polar types of NPO's were chosen in order to see if there is a difference in types of outcomes of Foundation funding.

#### *3.2.2. Findings*

Two main questions guided this research. First question is how does professionalization of NPO's unfold, and what is the role of Foundation funding in this process? The second question is what are the effects of NPO's becoming professionalized in terms of their mission and activities?

### **3.3. The road of NPO development in Croatia**

When analysing Croatian civil society, three phases of its development can be identified. The first phase was marked by external funding of the Croatian civil society provided by organizations such as USAID or Open Society. Civil society organizations had an important role in promoting democracy and human rights in a post – socialism country that also suffered an independence war in the process of changing from a centrally planned to a market economy. Foreign funders did not require detailed financial reports and transparency and civil organizations were not required to develop professional capabilities that they would require in a latter phase. The second phase started in the early 2000-s when foreign funding stopped and the civil society infrastructure was put in place. In order to help sustain and grow the civil society, Croatian government founded the National Foundation for Civil Society Development in 2003. The role of the Foundation was to strengthen the civil society and assure NPO sustainability, mostly through financing. Third phase in the development of the Croatian civil society is connected with the ascension of Croatia to the EU in July 2013 that opened new funding opportunities, as well as the new bill on NPO's passed in 2014 that regulated NPO commercial activities and raised the level of their transparency and accountability. The Foundation has a number of financial programmes aimed at helping the development and sustainability of NPO's. The most important ones can be found in Foundation's yearly reports and are as follows:

- **Institutional support**  
Institutional support is a specific type of financial support that is aimed at helping organizational development or stabilization in order to achieve long-term NPO survival and sustainability. NPO's that qualify for the institutional support gain a three year financing contract with yearly payments that can be spent only for salaries and running costs of the NPO.
- **Decentralized model of financing**  
Decentralized model of financing is led by four regional foundations that gain financial resources from the National foundation and help in strengthening local NPO's. These regional foundations also help in evaluation of project proposals and taking on some of the administrative work from the National foundation.
- **Knowledge centres for social development**  
Knowledge centres for social development are considered the forerunners of think-thanks in their respected areas. These centres conduct a number of activities. They analyse and research public policy regarding NPO's, advocate social change, transfer knowledge and have a role in developing social potential.

Institutional support is the most important financial tool that the foundation has. It accounts for more than 60% of yearly Foundation expenditures. According to the Foundation's yearly report for 2016, out of 204 NPO's that received institutional support, 66% of them also had commercial activities that diversified their funding streams. It can therefore be stated that Institutional support has helped NPO's develop skills and products that can be taken to the market, and this can be seen as one of the effects of foundation funding. Bode et al. (2006) claim that programme shifts and short-term funding have caused NPO's to become more business like. In Croatia, however, the role of the Foundation seems to be the opposite, since it provides security for NPO's through the instrument of Institutional support. Key persons running the Foundation view it as a partner to NPO's. One of the main reasons for this is the fact that the majority of the management board is not made up from government officials. The following answers from our respondents corroborate this claim:

- "The Foundation is somewhat distant from the state. We have the liberty to intervene in social development, and are allowed to fail. The state on the other hand could not easily justify funds spent on NPO development due to public scrutiny. The Foundation can be seen as a development agency that develops certain projects, observes and reacts to changes that are important for the civil society."
- "The foundation should not be viewed as someone steering civil society. It can be viewed as an institution that invests in things recognized as a need of the civil society. The main virtue of The Foundation is that it always knows how to listen, recognize and articulate what is important for the civil society, be that through a project call on in some other manner."
- "In its first phase, the Foundation acted as a stabilizer and allowed for the sustainability of civil society. Larger NPO's at the time were used to private donations and needed to learn a different mechanism of financing brought by the Foundation. Since we were a public donor we required a much greater dose of transparency. We were learning a lot at the time, and in that context the Foundation can be seen as a learning polygon. Over the past 15 years, the Foundation has had a number of different types of financing in order to enable all NPO's to adapt and learn how to use public funds in a transparent manner. It was very important for us, and we spent a lot of time in studying our own different activities and acting as a learning organization, because every mistake we made last year was evaluated and put in a new framework or rectified. At the same time we had a cooperation with NPO's and the were aware that there was no risk of them criticizing us and not getting any funding. We went through filters of building a relationship of trust that culminated in 2016 when the

government wanted to cut our funding, but the NPO's knew that we won't let them down and that we will find a way to fund their projects that were already signed. That level of our consistency and openness for different ideas, critique and readiness for change has led to us being recognized among NPO's that follow our work."

Based on the above quotes taken from our interviews we can state that the Croatian Foundation for Civil Society Development can be seen more like a NPO incubator or development agency, rather than strictly as a Foundation that hands out money and verifies NPO's reports on the funding. This provides for an interesting avenue for future research. The main effect that Foundation has on the civil society is the standardization of practices, transparency and accountability, or in other words professionalization. However, respondents also claim that as a consequence of this, a number of NPO's have become closed and elitist organizations.

- "The NPO's in Croatia currently suffer from a deficit of citizen involvement and opening up to the public. In some cases, NPO's become elitist organizations that have a only a few members and become self-sufficient. Of course, this is not always the case, since there is a great number of NPO's that do have significant societal impact, but are still not open to citizens. This has led to a negative perception of NPO's in the public eye. It can be stated that citizen mobilization in NPO activity is absent in Croatia. The inclusion of volunteers has also not been sufficient. Development of volunteering is a long term problem in Croatia, and the Foundation did not have open institutions or open NPO's in order to help promote volunteering."
- "Long-term existence of Institutional support shows us that it is something NPO's need because it assures their stability for at least three years through which they are receiving funding. Institutional support usually gets all the accolades and highest scores when we do our yearly on-line consultation with NPO's. Aside from our programmes, the greatest indirect contribution of the Foundation is the creation of standard of operations for NPO's. By following up on our financial supports, we followed and improved the work of NPO's as well. We were not acting as a police, but we made sure that money is being spent in the right way, and that NPO's have a clear standard of business as well as a clear standard of management. At the same time, we made sure NPO's were avoiding any conflict of interest, and even had some unpleasant situations due to that. We strengthened NPO's, gave them stability, but I also thing that we took the ladder of their responsibility for the way they conduct their activities quite high."

By looking through the web-pages of Foundation funded NPO's, all of them have very thorough activity and financial reports. It is important to notice that the Croatian law on NPO's changed in 2014 and regulated their commercial activities. Many of NPO's funded by the Foundation do indeed have commercial activities. One important thing regarding the relationship between commercial activities and Institutional support for the NPO's needs to be noticed. In order to give incentive to NPO's to develop other sources of income for their work, one of the conditions set by the Foundation for NPO's that applied for Institutional support was to have at least 10% of their yearly income coming from commercial activities. Following the economic crisis in 2008 this condition was revoked. The NPO's never saw it as something they needed to do in order to become sustainable, rather as a necessary condition that they were obliged to meet in order to be eligible for Institutional support.

- "A small number of NPO's that received Institutional support managed to develop market based services, but a greater number of them saw self-financing as a necessary condition for gaining Institutional support, and not as an end towards which they were striving themselves"

Skocpol (2003) notes that professionalization could lead to diminished experimentation of NPO's and lead to NPO's doing services only for others rather than with them. Jenkins (1998) has similar claims and states that NPO professionalization has shown to lead to successes in a prescribed manor and channels NPO's towards more moderate goals and tactics. According to the respondents, this is often a case when it comes to NPO's in Croatia. Based on the interviews conducted, from the viewpoint of the Foundation, professionalization can be seen as a main effect of foundation funding. This is expected and consistent with the existing literature (Hwang & Powell, 2009). A number of effects coming from the professionalization of NPO's has been identified as well. It would seem that NPO's receiving Foundation funding have become elitist and closed, which is somewhat contradictory to their role in the society. Another significant observation is that they have also become rigid, and do not accept new funding programmes easily. There also seems that there is a crowding out effect affecting smaller and less experienced NPO's due to limited assets of the Foundation. When analysing NPO's that received the highest amount of Institutional support over the past fifteen years, it can be seen that more than 70% of NPO's received it more than once, and a number of them have been receiving it constantly which could also explain their rigidity to a certain degree. Aside from the interviews with key informants from the Foundation, official documents such as mission statements, yearly activities reports and financial reports of a number of NPO's that received Foundation funding were analysed in order to see if there were any significant changes over the years, and can they be connected to the findings from the interviews. Generally, and without analysing the process through which this occurs, the effects of Foundation funding on NPO's mission can be divided in four groups:

- **Changing mission statement**  
In order to be eligible for more funding, some NPO's have changed their mission statements and the focus of their project proposals, but through the analysis of their activities it can be seen that they are still fulfilling the same societal purpose as before. It could be said that these organizations made deliberate strategic choices in order to enhance their organizational performance, as proposed by the rational theory.
- **Changing activities**  
Another group of NPO's on the other hand did not change their mission statement but have changed the focus of their activities which can be classified as traditional mission drifting. It can be said that these organizations have a policy – practice decoupling issue because they have, in a way, sacrificed their social mission in order to get more funding and in some cases they focused on commercial activities while neglecting their social mission (Bromley & Powell, 2012).
- **Resistance to change**  
The third group of NPO's have not made any changes in their mission statements nor did they change the focus of their activities. These organizations seem to have completely resisted the institutional pressure and managed to survive without conforming to the changing conditions in the environment. All organizations that fall into this group have a common trait of being self-sustainable mostly through private donations and are only occasionally using Foundation funding.
- **Complete change**  
The last group of NPO's have changed both their mission statement and the focus of their activities. It can be stated that the last group of NPO's has become completely institutionalized, and did not suffer from traditional mission drifting but rather from a legitimacy paradox, conforming to changes in the environment while on the other hand sacrificing their special role in the society (Maier et al., 2016). Most of these organizations are quite new, and were founded later than 2008. It is possible that these organizations were

not mission driven in the first place, but were merely seen as an opportunity for their founders to get employed outside the traditional labour market.

#### 4. CONCLUSION

Civil sector in Europe has undergone significant changes over the last couple of decades. NPO's have changed from mass voluntary organizations to specific service providers funded by the state. These changes were even more pronounced in post-communist countries that completely changed their economical and political paradigm in a short period of time. The government and the public demanded more transparency and accountability from NPO's being funded by public funds, and one of the main effects of these changes was the professionalization of the civil sector. There are a number hypothesized effects professionalization has had on NPO's. One of these effects is mission drifting, but findings in the literature are ambiguous and this matter still needs further research. Among other factors, national foundations for the development of civil society can be seen as drivers of professionalization. This on-going study is an attempt to qualitatively explore the influence foundation funding has on NPO's based on a case of Croatian National Foundation for the Development of Civil Society. Main effect of foundation funding in Croatia is that NPO's have become more professionalized. Over the course of the past fifteen years, NPO's funded by the National Foundation for Civil Society Development have become more transparent, accountable and have raised the standards of their conduct to a higher level. It can be stated that NPO's being funded by the Foundation are becoming similar in this way as is expected by Hwang & Powell (2009). From the Foundation viewpoint, a number of effects coming from the fact that foundation funded NPO's have become more professionalized can be identified. One of these effects is NPO's closing down on the general public. There are a number of other possible factors influencing this, such as the bad public image NPO's have in Croatia, but further research into this matter is required. It seems that Foundation funded NPO's have also become more rigid over time and do not accept new funding programmes easily. This can perhaps be explained by the fact that they developed a certain skillset allowing them to be very successful at applying to various Foundation grants, and now feel threatened by any change that may take place and perhaps endanger their position as experts in Foundation grant schemes. A specific issue taking place in the case analysed is that there seems to be a crowding out effect happening in the Croatian civil society. Early entrants or NPO's that were the first to grow and develop managed to get Foundation funding and have been getting it ever since due to their expertise. Also, when the law on NPO's changed in 2014, using their strength and human resources, a number of them offered their services to the market and become quasi social enterprises, utilizing their knowledge to secure NPO funding, while diversifying their funding streams by entering the market. On the other hand, incumbent NPO's seem to have difficulties in gaining larger Foundation grants and are growing at a smaller pace. The main reasons are limited resources that the Foundation has available. Based on an analysis of mission statement changes, yearly activity reports and financial reports, Foundation funded NPO's can be divided into four distinct groups regarding the effect Foundation funding has had on the relationship between their mission (achieving societal purpose) and activities. NPO's that qualify in the first group "changing mission statements" are prone to change their stated mission often in order to better fit project calls, but their core activities and target groups within the society remain unchanged. The second group "changing activities" do not change their mission statements but have changed the processes and activities within their organizations to better fit grants and projects proposals. These organizations suffer from policy – practice decoupling. The third group of NPO's uphold their missions and do not conform to changing conditions in the environment. These organizations are usually financially very sound, and other than being funded by the Foundation receive funds from various private donors. The fourth distinct group of NPO's have no problem in changing both their mission statements and activities of the

organization. It would seem these organizations are more business like than any of the three before mentioned groups. Most of them are rather new, and it is possible that they were founded not as mission driven but rather as “grant driven” organizations. The first proposition for future research is to investigate the mechanism within NPO’s that lead to one of the four described outcomes regarding mission drift and the role Foundation funding played in this process. This should be done through semi structured interviews with key informants in the NPO’s who have significant knowledge of the processes that have taken place in the NPO’s. Further research should also be done on the role of the Foundation as an open system orchestrator for NPO’s and the mechanisms and different ways through which it influences NPO’s.

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## THE INFLUENCE OF SOCIO-RELIGIOUS CULTURE FROM AN ENVIRONMENTAL PERSPECTIVE

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### **ABSTRACT**

*There is an apparent disconnection between religion and the environment, given they are very distinct concepts, present in different plains. However, a closer look at this matter reveals many areas where both concepts intermingle, establishing a connection between both worlds. The hardest task resides in understanding the environmental issues present in the Bible and Torah due to a hermeneutical problem in the genesis text, relative to the concept of Man “dominate” over the rest of God's Creation, relegating the environmental perspective and care to a background element. These have slowly been recovered facing the climate changes and natural disasters caused by the increasing pollution. On the book of Genesis, we can read that God/Yahweh said to the first Humans to dominate the remainder of his Creation. This was understood as an authoritarian rule over Nature, meaning Humankind could explore, but also manipulate it at their own volition without worrying about any kind of environmental management or ecological balance given the false presumption of the existence of unlimited resources. However, this vision of “domination” (Hebrew: radu) over the animal and plant world do not coincide with an anthropocentric vision - as it was previously interpreted, opening a route to an abusive exploration of natural resources, including destruction and slaughter - but rather a theocentric approach, based on care and respect. It is time, in strict respect for the sacred principle of religious freedom and for the secular vocation of democratic and civilized states, to deal with this complete social scourge, which in no way contributes to social, economic, psychological sustainability and the well-being of populations.*

**Keywords:** *environment, domination, hermeneutics, religion*

### **1. INTRODUCTION**

There is an apparent disconnection between religion and the environment, given the fact that they are entirely different concepts, present in very distinct platforms. However, after a close analysis we can see many fields where said concepts do intermingle and connect their worlds. DAVIE (1994) argues that, despite the decline of religious possession, practice and belief in Europe, the debate on religious phenomena and their presence in public space has gradually increased. Thus, there is relevance in investigating the great social, cultural and political issues also in the light of the religious phenomenon. Given this, what will be the influence of socio-religious culture from the environmental point of view? How does religion (in this case referring to Christianity) influence or not the environmental conscience of citizens and public policies?

### **2. THE HERMENEUTICAL PROBLEM**

At least from the Judeo-Christian point of view, everything starts, with a problem of interpretation of the genic text. When one reads in the Book of Genesis that God the Creator (Yahweh) told the human being he created to dominate the remaining Creation, it was understood that it was a delegation of discretionary authority over Nature. This meant men could not only enjoy and exploit it, but also manipulate it according to their desires and interests, without regard to any kind of environmental management or ecological balance, given the false presumption of the existence of unlimited natural resources.

The Torah says that:

- a) and God said, Let us make man in our image, after our likeness (Gn 1:26) (Psalms 8:5: "For thou hast made him a little lower than the angels, and hast crowned him with glory and honour");
- b) the human being was placed in a position of "domination" over the animal and vegetable world - 26: "And God said: Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl in the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth; 28 - "And God blessed them, and God said unto them: Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth";
- c) the human was blessed by God (28a).

But the position of "domination" (heb. *radu*) over the animal and plant world does not mean an anthropocentric view - as interpreted later, opening the way to the abusive exploitation of natural resources, including destruction and slaughter - but theocentric, signifying care and respect. In fact, the genic text of Creation does not even state that animals serve as food for humans, but only vegetable resources... The idea of "domination" in the priestly text<sup>1</sup> (called "the hymn of Creation") must be interpreted as God's delegated care of the human being: that is, without tyranny or cruelty, in line with the text of the Yahwist narration when it tells man to care for the Garden of Eden. Therefore, it is a matter of caring for the created world (the "common house"), which we need and are part of, and which we are obliged to respect and preserve. However, the historical truth is that we find the practice of animal sacrifice to the gods, right at the dawn of humanity. The very law of Moses ends up not only consecrating such sacrifices, but also allowing an animal diet, albeit selectively, especially for reasons of public health, by avoiding (ceremonially) impure animals. However, from a broader religious perspective, it should be noted that Hinduism for example presents a different posture regarding the relationship with other living beings, which are subject to a very special respect. Unlike many western countries, India has a history of fighting for animal well-being. The law forbids testing cosmetics on animals, and recently one of the states in India has decided to ban the incarceration of birds in cages, though it has ended up not going forward. Manmohan Singh, the judge in charge of the decision said: "It is clear in my mind that all birds have the fundamental right to fly in the skies and that humans do not have the right to keep them in cages to satisfy their selfish purposes, whichever it may be "<sup>2</sup>.

### 3. GOD AND NATURE

In the New Testament it is said that animals, although they may have a small commercial value, have immense value to God: Matthew 10:29 - "Are not two sparrows sold for a farthing? (insignificant value) and one of them shall not fall on the ground without your Father." And not: "without the will of your Father". The text does not include the words "the will of". Instead, it includes in italic what it means, which is not included in the old Greek texts. The meaning is that nothing happens evil in this world without the Father not suffering as well. The two little birds would not fall to the ground without the Father falling with them, without suffering with them, being at his side. God would always be close to those who suffer. Even the animals...

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<sup>1</sup> We have at the beginning of Genesis two narratives of creation: the text of the priestly code (P, from the German 'Priesterkodex') - Gn 1, 2, 4<sup>a</sup>; and the Yahwist text - Gn 2,4b-25. The last and most ancient text was written during the period of Solomon's reign, while the priestly text is from the time of the exile.

<sup>2</sup> Hypeness. <https://www.hypeness.com.br/2019/02/india-proibe-passaros-em-gaiolas-em-decisao-> (checked on 6/2/19).

### **3.1. Provisions of the Mosaic Law on Animals and Nature:**

Defend and protect animals even when it is not yours:

“Thou shalt not see thy brother's ass or his ox fall down by the way, and hide thyself from them: thou shalt surely help him to lift them up again.” (Dt.22:4), “Thou shalt not see thy brother's ox or his sheep go astray, and hide thyself from them: thou shalt in any case bring them again unto thy brother. And if thy brother be not nigh unto thee, or if thou know him not, then thou shalt bring it unto thine own house, and it shall be with thee until thy brother seek after it, and thou shalt restore it to him again. In like manner shalt thou do with his ass...” (Deuteronomy 22:1-3a).

Respect the rhythm of animals:

“Thou shalt not plow with an ox and an ass together.” (22:10).

Respect for the feeding needs of animals:

“Thou shalt not muzzle the ox when he treadeth out the corn.” (25:4).

Do not eat the progenitor and the children simultaneously:

“If a bird's nest chance to be before thee in the way in any tree, or on the ground, whether they be young ones, or eggs, and the dam sitting upon the young, or upon the eggs, thou shalt not take the dam with the young. But thou shalt in any wise let the dam go, and take the young to thee; that it may be well with thee, and that thou mayest prolong thy days.” (22:6-7).

Respect the differences in species of Nature:

“Thou shalt not sow thy vineyard with divers seeds: lest the fruit of thy seed which thou hast sown, and the fruit of thy vineyard, be defiled.” (22:9).

Respect the environment even in situations of war:

“When thou shalt besiege a city a long time, in making war against it to take it, thou shalt not destroy the trees thereof by forcing an axe against them: for thou mayest eat of them, and thou shalt not cut them down (for the tree of the field is man's life) to employ them in the siege: Only the trees which thou knowest that they be not trees for meat, thou shalt destroy and cut them down; and thou shalt build bulwarks against the city that maketh war with thee, until it be subdued” (20:19-20).

Nature is under a curse:

And unto Adam he said: Because thou hast hearkened unto the voice of thy wife, and hast eaten of the tree, of which I commanded thee, saying: Thou shalt not eat of it: cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life. Thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field. In the sweat of thy face shalt thou eat bread, till thou return unto the ground; for out of it wast thou taken: for dust thou art, and unto dust shalt thou return” (Genesis 3:17-19).

The New Testament proves this idea:

“For we know that the whole creation groaneth and travaileth in pain together until now” (Romans 8:22).

### **3.2. The Year of the Jubilee:**

In the Mosaic law of Old Israel, even the land deserved rest after a few years of harvest. Also in the framework of the Israeli legal framework, in order to establish and preserve social justice

guidelines, Tanakh<sup>3</sup> also foresaw the Jubilee year every fifty years, in order to promote the principle of balance in community relations. In fact, this measure worked as an instrument of social balances in order not to perpetuate injustices in the community. The Jubilee is the year following a "week of weeks" of years. Speak unto the children of Israel, and say unto them, When ye come into the land which I give you, then shall the land keep a sabbath unto the LORD (Leviticus 25: 2). Six years thou shalt sow thy field, and six years thou shalt prune thy vineyard, and gather in the fruit thereof; (25:3). But in the seventh year shall be a sabbath of rest unto the land (25:4). And thou shalt number seven sabbaths of years unto thee, seven times seven years (25:8) And ye shall hallow the fiftieth year (25:10). It is believed that the first year of the Jubilee was observed in 1445 BCE and continued to be celebrated during the captivity in Babylon. At present it is not observed.

#### 4. ESCAPISM

Moreover, part of today's Christianity in the world - especially the more conservative evangelical fringes - has an escapist perspective. Based on the doctrine of the imminence of the Second Coming of Christ (Parousia) he developed an exclusivist culture of the present moment, with no perspective of the future. From the second half of the twentieth century onwards there had been behaviors among the Christians resulting from this line of thought, which had been denied marriage (thus renouncing the formation of a family), and even for refusing to work for the same reasons, since Parousia was imminent : "And, behold, I come quickly" (Revelation 22:12). The situation rose to a point that Paul was forced to write "if any would not work, neither should he eat." (2 Thessalonians 3:10), developing a work theology, connecting it with a sense of dignity and meaning. On the other hand, Christianity became bourgeois and individualistic - a circumstance that Modernity came to deepen through the primacy of the individual - essentially relegating evil to the subjective field and emphasizing individual sins. The result is that this form of Christianity tends to preserve itself from the contamination of the world, from this outside "evil" and even abstaining to fight against it, giving up any attempt to combat the evils of society due to the eschatological perspective and Parousia's expectations. This escapist and individualistic Christianity, which ignores the environment (as part of the "world" to avoid) is completely oblivious to climate change, the poverty conditions in which a large part of the human population lives, the bloody wars that exterminate thousands of people, migratory flows and most social injustices. It was this form of Christianity that championed slavery and fought against its abolition, which justified the absence of civil rights in the United States, blessed the apartheid in South Africa and rejected the evidence of climate change by human action. But there is hope. Just as the English parliamentarian and Protestant William Wilberforce was at the forefront for the abolition of slavery in the British Empire, Baptist pastor Martin Luther King led the struggle for civil rights, paying the price with his own life, and as the Anglican bishop Desmond Tutu fought the apartheid regime hand in hand with Nelson Mandela, so has the Pope drawn the attention of the world insistently to the importance of the "common house." According to FRANCO (1919): "With climatic changes as the axis of reflection, Francis exalts in the encyclical *Laudato Si* the human conscience of respect for the environment. Without the commitment of the Common House and the defense of Creation - a Judeo-Christian way of interpreting nature - justice and peace will never be possible. We know that about a third of the food produced is wasted, and the food that is wasted is as if it were stolen from the table of the poor" (50, LS). The Pope calls for "attention to the imbalance in the distribution of population across the territory, both nationally and globally, because increased consumption would lead to complex regional situations through combinations of problems related to environmental pollution, transport, waste treatment, loss of resources, quality of life"

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<sup>3</sup> Canonical collection of the Israeli texts and source of the Christian canon of the Old Testament. This collection is composed of texts written in biblical Hebrew, with the exception of the books of Daniel and Ezra, which include excerpts in Aramaic.

(50, LS). It is not surprising that the encyclical *Laudato Si* was seen as a declaration of war against interests built around the exploitation of natural resources, based on a model of life and consumption that leads to doom. It was after this text - after the exhortation where the pope says that "this economy kills" (apostolic exhortation *Evangelii Gaudium*, 2013) - and the intransigent defense of the migrants, with harsh criticism of Trump, that the Pope has been the target of an aggressive campaign in the United States, accused of being a dangerous extremist and communist."<sup>4</sup> Tomás Halik, the Czech theologian once said: "I like that tale of Saint Martin in which Satan appeared to him under the figure of Christ. But Saint Martin asked him, 'Where are your wounds?' I do not believe in Christ without wounds, I do not believe in a Church without wounds, I do not believe in faces without wounds. I believe that Jesus came to heal us through his wounds." In fact, this individualistic Christianity, without wounds that ignores the suffering of others and the pain of thy neighbour is usually the same fundamentalist Christianity that also despises the destruction of the environment and its consequences, especially for the poorest and most vulnerable as well as opposing climate policies in the name of easy and ever-increasing profit. For years the financial markets have decided to invest in grains, buying up production before harvesting for financial speculation and inflating prices. In 2009, speculators held 65% of long-term contracts for corn and 80% of wheat according to UNCTAD<sup>5</sup>. In July 2010, the price of wheat increased by 60%, and corn by 40% between July and August, which had a domino effect on other staple foods. The sharp rise in the price of grains then raised the price of some essential food commodities to unbearable levels, resulting in the death of significant population groups in the poorest regions of the world, for obvious reasons.

## 5. CONCLUSION

The influence of some socio-religious culture in the face of environmental concerns needs distance itself from the land of alienation and approach a civic responsibility stance in the name of an integral ecology, thinking more about everyone rather than the individual and the future than the present, taking into account the environmental inheritance that will remain for future generations. It is time, in strict respect for the sacred principle of religious freedom and for the secular vocation of democratic and civilized states, to deal with this authentic social scourge, which in no way contributes to social, economic, psychological sustainability and the well-being of populations.

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<sup>5</sup> United Nations Conference on Trade and Development (UNCTAD), founded in 1964, based on Geneva, Switzerland.

## **BUSINESS CONTINUITY MANAGEMENT AND STRATEGIC RESILIENCE**

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### **ABSTRACT**

*This paper offers a new research approach to analyzing the efficiency of business continuity management and organizational strategic resilience. A model was developed to explore connection between efficiency of the business continuity management and strategic organizational resilience. The empirical research was based on the main hypothesis, H1, which tested the connection between the success of business continuity management and strategic elasticity. The relationship between the success of business continuity management and strategic elasticity on the one hand, and strategic planning on the other hand, was tested with the H2 hypothesis. Other hypotheses (H3, H4 and H5) check the relationship between the success of business continuity managing and the activity and size of the company and its exposure to crises in the past.*

**Keywords:** *crisis, bussines strategy, strategic resilience, bussines continuity management, risk management*

### **1. INTRODUCTION**

Today, the increased uncertainty in the global business environment leads to the unprecedented volatility in the business so enterprises face significant challenges in order to maintain their business. Companies have systems of crisis management in order to ensure business continuity. One of the ways of such proactive action is a system of managing business continuity that is aimed at preserving the resilience of key business processes, systems and assets. The primary objective of the business continuity management is to ensure continuity in terms of utilization of products and services, processes, and human resources, while also protecting the reputation of the company.

### **2. ORGANIZATIONAL AND STRATEGIC RESILIENCE**

Organizational resilience is important for two key reasons - primarily because society and organizations are interdependent in a complex environment, and second, because the elasticity may result in a competitive advantage. Capacity of organizational elasticity keeps its ability to withstand the specific situation, robust and transformative action when confronted with an unexpected and intense events that have the potential to jeopardize its long-term survival. Connection between organizational resilience and business continuity management is analog to natural processes. After the shock and survival reflex is an attempt to return to the „zero state“ and after ensuring business continuity, the goal is to raise the level of business operations on

the level they were on before the disturbance. Accordingly, this paper analyzes the relationship between business continuity management and strategic resilience. Organizational resilience is placed into strategic perspective to ensure a common denominator for the planning and continuity of such categories which involve a longer time horizon on the one hand, and organizational flexibility that in its basic appearance, without considering the context of the strategy is only a moment. The main objective of this paper is to clarify the interconnection of business continuity management effectiveness and strategic resilience. Strategic resilience is a multi-dimensional feature that enables organizations to efficiently absorb, respond and even, potentially, capitalize on interferences in business. The result is a process that helps the organization to keep resources in a form that can positively cope with the unexpected, and to avoid negative tendencies, and managing business continuity in its essence is precisely this process, whose success is measured by the level of coverage, the level of involvement and level of application.

### 3. RESEARCH

Data gathered was analyzed using Microsoft Excel and Statistical Package for the Social Sciences (SPSS). The empirical research was based on the main hypothesis, H1, which tested the connection between the success of business continuity management and strategic elasticity. The relationship between the success of business continuity management and strategic elasticity on the one hand, and strategic planning on the other hand, was tested with the H2 hypothesis. Other hypotheses (H3, H4 and H5) check the relationship between the success of business continuity managing and the activity and size of the company and its exposure to crises in the past. The first hypothesis assumed that the success of business continuity management influences the strategic elasticity of the company. The results of the variance analysis showed that there was a statistically significant difference ( $F = 30.289$ ,  $\text{sig} = .000$ ) at the level of strategic elasticity with regard to the existence or non-existence of formal business continuity management plans. Also, the relationship between the level of the business performance index and the strategic elasticity level index is positive and moderate intensity, statistically significant at the level of 1% ( $r_s = 0.522$ ,  $\text{sig} = .000$ ). The results of logistic regression suggest that the success of business continuity management is a statistically significant predictor for the company to belong to a group that has a high level of strategic elasticity. The prospect that the company belongs to a group with a high level of strategic elasticity is 4.345 times higher for companies with an above-average level of business continuity management index compared to companies with below-average level of success rate of business continuity management, that is, expressed in percentages when the degree of business performance management index Continuity above, the prospect that the company will belong to the group has a high level of strategic elasticity indexes are higher by 334.5% compared to companies that have below-average degree of success in managing business continuity. In view of all the above results, H1 hypothesis can be supported. The second hypothesis assumed that there was an empirically provable link between the success of business continuity management and strategic elasticity on the one hand, and strategic planning on the other. The relationship between strategic planning formalities and business continuity management success rate is positive and moderate intensity ( $r_s = 0.368$ ,  $\text{sig} = .000$ ), but also statistically significant at the level of 1%. The relationship between the level of the strategic elasticity index and the level of strategic planning formalities ( $r_s = 0.307$ ,  $\text{sig} = .000$ ) is somewhat weaker, but it is both positive and statistically significant at a level of significance of 1%. In view of all the above results, H2 hypothesis can be supported. Third hypothesis assumes that there is a connection between the success of managing the business continuity and the industry to which the enterprise belongs. Whether the analysis of the variance explores whether there are differences in the level of the business continuity management index with regard to the activity of the companies included in the

sample, it is noted that there are differences, and this is statistically significant. The largest differences between enterprises from different activities are in the total index level ( $F = 2.811$ ,  $df = 3$ ,  $sig = .003$ ). The following is the difference in coverage level as a factor of the success rate of business continuity management ( $F = 2.046$ ,  $df = 3$ ,  $sig = .004$ ), and the inclusion level ( $F = 2.686$ ,  $df = 3$ ,  $sig = .004$ ). Considering the differences in the application level, they are, considering the different activities of the observed companies, at least ( $F = 2.393$ ,  $df = 3$ ,  $sig = .010$ ). Consequently, H3 hypothesis can be supported. Fourth hypothesis assumes the influence of the size of an enterprise on the success of business continuity management. Whether the differences in the success rate of business continuity management are observed in individual groups of companies covered by the sample in terms of size, the analysis of the variance determined significant statistical differences. The most pronounced difference between the different sizes of the company is when considering the level of coverage as a factor in the success rate of business continuity management ( $F = 11.150$ ,  $df = 3$ ,  $sig = .000$ ). The following is the difference in the overall level of business continuity management index ( $F = 11.046$ ,  $df = 3$ ,  $sig = .000$ ), and the level of application ( $F = 10.387$ ,  $df = 3$ ,  $sig = .000$ ). Observing the differences in the level of involvement, they are, considering the different size of the company smallest ( $F = 4.794$ ,  $df = 3$ ,  $sig = .004$ ). Also, the results of the survey show that among all the factors that form the index of success of business continuity management, there is a link to the size of the company, statistically significant at a level of significance of 1%. The strongest, positive relationship of moderate intensity ( $r_s = 0.295$ ;  $sig = .002$ ) was recorded between the size of the enterprise and the level of coverage as a factor in the success rate of business continuity management. The relationship between the size and the total index level ( $r_s = 0.290$ ;  $sig = .003$ ) is followed. The relationship between the size of this level applied.

#### 4. CONCLUSION

This paper offers a new research approach to analyzing the efficiency of business continuity management and organizational strategic resilience. A model was developed to explore connection between efficiency of the business continuity management and strategic organizational resilience. Prior research partially covered individual elements of business continuity management and recovery from the crisis. In addition, for the purposes of research conducted in this paper, an index of the efficiency of business continuity management and index of strategic resilience were developed. Croatian companies do not apply this concept adequately, although its effects on the company's resilience and to other vital characteristics are more than positive. The structure of companies that have implemented some form of formal business continuity management is a sort of surprise - most of them are of medium-sized companies. It is obvious that small businesses do not see the justification for the cost of implementing business continuity management when compared to potential benefits, nor do they have the time and personnel for the implementation of this concept. Situation in large enterprises should be of concern. The Croatian companies paradigm of "too big to fail" is obviously still in place and even the recent economic events have not been sufficient incentive to open the eyes to potential threats and their impact on businesses. On the other hand, corporate governance, and as well as in most other areas in Croatia, a legal requirement is the the main reason for the implementation of business continuity management. Given the current economic situation, but also world experiences (eg American and British regulations in this area), expanding the base of operations in which the legislator requires certain level and scope of business continuity management, in accordance with the results of this research, can only have a positive overall impact. This research also identified specific requirements of regulators in sectors where those were not be expected - for example, gambling industry (in the research classified as "other service activities"). There is a clear desire of regulators in to regulate continuity in sectors whose activities that are based solely on the confidence of citizens in the



regulator, and its ability to be a mediator in a potential crisis situation. For the purpose of achieving objectives of this research, five research hypotheses were set. First hypothesis assumed that the success of the business continuity management affects the organizational strategic resilience. There was a statistically significant difference in the level of strategic resilience with respect to the existence or absence of formal management plans for business continuity. Also, the link between levels of performance indicators for business management and strategic level index of resilience is defined as of positive and moderate intensity. However, the results of logistic regression suggested that the success of the business continuity management is not a statistically significant predictor that company belongs to a group that has high level of strategic resilience. Second hypothesis assumes that there is empirically provable connection between the success of the management of business continuity and strategic resilience on the one hand, and strategic planning on the other. The link between the formality of strategic planning and the level of performance indicators for the business continuity management is positive and of moderate intensity, while the relationship between the level of the index of strategic resilience and the level of formality of strategic planning is somewhat weaker, but it is a positive and statistically significant. Given all of these results, second hypothesis is accepted. The third hypothesis assumes that there is a connection between business continuity management efficiency and the industry in which the company operates. Analysis of variance was investigated and whether there are differences in the level of performance indicators for the business continuity management due to the activity of companies included in the sample. It was found that there are differences, and that they are statistically significant. The biggest differences between companies from different sectors are in the overall level of the index, followed by the difference in the level of coverage as a factor performance indices for the management of business continuity and level of involvement. Regarding the differences in the level of application, they are, given the different activities observed companies, the smallest. Consequently, the third hypothesis is accepted. The fourth hypothesis assumes the impact of the size of the company on the success of the business continuity management. Regarding the differences levels of efficiency indicators for the business continuity management in the individual group of companies included in the sample, considering their size, analysis of variance showed significant statistical differences. Also, research results show that among all the factors that constitute the index management of business continuity management efficiency, there is no connection to the size of the company that would be statistically significant. The research results also undeniably confirm that the support to the fourth hypothesis can be accepted. In conclusion, the fifth hypothesis assumed that companies exposed to crisis events in the past are more successful in business continuity management. Observing the level of efficiency indicators for the business continuity management in respect of whether the company has been exposed to a crisis or not in the past five years, research shows that a statistically significant relationship between exposure and the level of deep crisis, and the overall level of index of business continuity management efficiency. The biggest difference between companies that have been exposed to the crisis and than those who were not is the level of coverage and the level of application, then the difference in the overall level of the index, so the and fifth hypothesis is accepted.

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## EMPLOYMENT IMPACT OF THE GLOBAL VALUE CHAIN PARTICIPATION - EVIDENCES FROM MULTI-COUNTRY EXPERIENCE

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### **ABSTRACT**

*Applying a set of comprehensive Global Value Chain (GVC) indices, this study evaluates the GVC's employment impact with the most recent WIOD dataset between the years 2000 and 2014 from 56 industries in 43 economies, which include 28 EU countries and 15 other major countries and are classified into high-, middle-, and low-productivity groups. The results show that GVC participation only has some small positive impact for more advanced economies when the forward and backward GVCs are combined in estimation, all other impacts are very weak and insignificant. Also, the backward GVCs tend to be more beneficial in generating domestic job opportunities than the forward GVCs, especially for the less developed economies.*

**Keywords:** *Backward GVC linkage, Employment, Forward GVC linkage, Global Value Chains, GVCs*

### **1. INTRODUCTION**

International trade has been increasingly dominated by global value chains (GVCs), where the intermediate goods and services, instead of the final goods, are exchanged between countries. A joint report by OECD, WTO and UNCTAD finds that between 30% and 60% of G20 countries' exports are comprised of imported inputs or used as inputs by others (OECD, WTO & UNCTAD, 2013). United Nations Conference on Trade and Development's 2013 World Investment Report also finds that about 60% of global trade (\$20 tri) consists of trade in intermediate goods and services, which are then incorporated at different stages of production (UNCTAD, 2013). According to an OECD report in 2015, around three quarters of international trade is businesses buying intermediate inputs (OECD, 2015). The prevalence of GVCs has significantly transformed the world trade, and therefore the definition of exports and imports. As the traditional measures of trade and competitiveness change, so should their interpretation and their impacts on economy. With value-added trade, the relationship between trade and employment becomes more complicated. The labor content associated with a country's international trade goes beyond domestic labor contained in exports and foreign labor contained in imports. With GVC trade, three more categories of employment come into play: foreign labor contained in exports, domestic labor contained in imports and third-country labor contained in a country's imports (Jiang & Milberg, 2013). Since GVC measures the degree a country's participation in global value chains, it focuses on the imports/exports of intermediate goods, while ignoring the imports/exports of final goods. Imports of final goods affect domestic job market negatively to the degree that the imported goods substitute for the domestic final goods. Imports of intermediate goods could still have similar substitution effect on domestic jobs. However, imported intermediate goods are directly used by the importing industry for further production, thus likely expanding its demand for labor. GVCs' perspective also highlights the positive impact on domestic jobs when the import contains significant domestic labor content, as illustrated in the case of iPhone and iPad. On the other hand, although exporting intermediate goods or services shares the same positive impact on domestic jobs as exporting final goods or service, it is also exporting downstream job opportunities to other countries, thus adding possible negative impacts on domestic jobs. As GVC trade becomes increasingly dominant in the world economy, it is important to highlight all these important impacts hidden in the

traditional measure of gross trade. The current study will examine the GVC's employment impact using the World Input-Output Data from 56 industries in 43 economies. The 43 economies including 28 EU countries and 15 other major countries in the world are classified into three categories based on GDP per person engaged: high-productivity, middle-productivity and low-productivity economies. Based on the multi-country data, we try to examine if deeper involvement in the GVC is beneficial or detrimental to the domestic job opportunities. Are there any differences in the GVC's employment impact between an advanced economy and a less advanced economy? The hypothesis to be tested in the current study is that the employment impact of the GVC participation will exhibit a different pattern among the economies of different level of development. We cannot mechanically copy one country's experience to another.

## 2. LITERATURE REVIEW

Studies on GVC trade's impact on employment started to appear in the literature around 2000, initially focusing on the impact of outsourcing. As summarized in Görg (2011), the impact of outsourcings on employment could be complicated, including a technology (or relocation) effect and a scale effect [in the terminology of Hijzen & Swaim (2007)] the former displacing workers and the latter increasing business productivity, operation efficiency and sales, thus increasing employment. Studies on employment impact should consider not only direct effects on the enterprise engaging in offshoring, but also possible indirect and second-order employment effects on other firms and broader ripple effects on the overall employment in the economy. Empirical studies have generated mixed results. In a report that analyzes the specific factors that affect the competitiveness of developing countries in GVCs, Bamber, Fernandez-Stark, Gere, and Guinn (2013) suggests that, for developing countries, GVC participation generally tends to lead to job creation and to higher employment growth. GVCs are also found to cause reallocation of jobs across and within countries (Grossman & Rossi-Hansberg, 2008). Reallocation of jobs between occupations takes time especially for low-skilled workers. In the presence of frictions in labor markets, the process of reallocation can lead to short-term unemployment in certain industries or occupations, even if aggregate employment may not be reduced. Taglioni and Winkler (2014) emphasizes how GVC trade can help upgrade the quality of the local labor force through three mechanisms: demand effect, training effect and labor turnover effect. Therefore, GVC participation may cause higher demand for high-skill workers. Some earlier multi-country studies generate mixed results. Using twelve OECD countries' sector data that covers 26 industries from 1995 and 2000, OECD (2007) finds small job loss effect from offshoring. For a 1% increase in offshoring, the sectoral employment will contract by 0.15% in manufactories, but roughly 0.08% in services. The impact on employment varies from sector to sector and from country to country. Falk & Wolfmayr (2008) finds similar small negative impacts of outsourcing on employment in both the manufacturing and non-manufacturing sectors by using input-output tables for five European countries. Hijzen and Swaim (2007) uses sectoral data for 17 high-income OECD countries from 1995 and 2000 in a similar study. By separating the technology (or relocation) and the scale effects, they find offshoring has no effect or a slight positive effect on sectoral employment, which is consistent with findings by Amiti & Wei (2005a; 2005b). Their findings suggest productivity gains from offshoring may be sufficiently large that the jobs created by scale effect completely offset the jobs lost by relocation effect. Current empirical studies on GVC's impact on employment tend to focus on one of its two important dimensions: outsourcing or offshoring, what is now termed "backward linkage" in the GVC literature. There is a striking lack of studies on the "forward linkage" impact. Under the strong influence of traditional framing in theoretical and empirical studies on the employment impact of international trade, it is understandable to see how the backward linkage has gained such prominence in the literature.

However, global value chains link an economy not only through importing intermediate goods from its upstream foreign suppliers but also through exporting intermediates to its downstream foreign users, the “forward linkage”. A study on GVC’s employment impact should take both the “backward linkage” and “forward linkage” into consideration to provide a complete picture. This paper intends to complement the existing empirical studies on GVCs impact on employment by applying a comprehensive set of GVC indices recently developed by Wang, Wei, Yu & Zhu (2017), which measures both the backward and forward GVC linkages based on data from the World Input-Output Database that covers the years between 2000-2014 across 56 primary, manufacturing, and service industries in 43 economies. We hope our study will shed more light on the current issue surrounding GVCs’ impact on employment in the multi-country context. The rest of the paper is organized as follows: the next section discusses the GVC measurement and related data; Section 4 introduces the theoretical and empirical models for our estimation; Section 5 then discusses the estimation results; finally in Section 6 we draw some conclusions.

### 3. GVC MEASUREMENT AND DATA

A GVC can be simply defined as the value added of all activities around the world that are directly and indirectly needed to produce a final product, like an iPhone. A little more elaborate definition, adapted from the Global Value Chain Initiative at Duke University, states that “[a] global value chain describes the full range of activities undertaken to bring a product or service from its conception to its end use and how these activities are distributed over geographic space and across international borders” (DFAIT, 2011; Amador & di Mauro, 2015). The key elements of a GVC are therefore “value-added” and “disintegration of the process across borders”. In order to trace out the source and use of the value-added across international borders, a world input output table is typically used to account for the GVCs at country-industry level. Each row of the input-output table shows how a country-industry’s output is used as intermediate inputs across industries, and as final products, in various countries in the world. Each column shows how much each country-industry in the world contributes to the production of a particular country-industry’s output. The value added from an industry is its output minus the value of the intermediates inputs. Following Leontief’s pioneer work in input-output model, matrix operations are then used to establish the relationship between the input requirements from all the related country-industries and the change in the final demand for a product. The cross-border input-output connection then provides the basis to measure the degree of global value chain participation. There have been various measures for GVC participation used in literature. The most recent and comprehensive one is proposed by Wang et al. (2017), which clearly define GVCs only as those value added creation whose embodied factor content crosses national border for production purposes, and proposed a set of GVC participation indices, corresponding to a producer’s perspective (based on forward industrial linkages) and a user’s perspective (based on backward industrial linkages). The backward linkage shows how much an industry depends on the imported intermediate inputs from other countries. China’s tire industry importing natural rubber from Thailand, Indonesia, and Malaysia is a good example of backward GVC linkage. The backward GVC participation index is thus defined as the share of all upstream sectors’ value-added in an industry’s total GDP:

$$GVC_{Pt\_B} = \frac{GVC\_B}{Y'} = \frac{GVC\_B\_S}{Y'} + \frac{GVC\_B\_C}{Y'} \quad \text{Eq. (1)}$$

The forward GVC linkage shows how much a country-industry contributes to the global value chain activities by exporting intermediate inputs to other countries’ industries.

US auto industry exporting billions of dollars of auto parts to Mexico and Canada's auto industry is an example of the forward GVC linkage. The forward GVC participation index is thus defined as the share of all downstream sectors' use of a home industry's value-added:

$$GVC_{Pt\_F} = \frac{GVC\_F}{Va'} = \frac{GVC\_F\_S}{Va'} + \frac{GVC\_F\_C}{Va'} \quad \text{Eq. (2)}$$

Since an industry could be engaged in both backward and forward GVC activities, a GVC ratio can be derived from the relative values of the two indices to indicate a country-industry's position in the global value chain activities. If we define GVC Ratio as the ratio of forward participation index to the backward participation index, a higher value indicates that the country-industry is dominated by upstream production activities in that global value chain. We will use the World Input-Output Database (WIOD) constructed by the WIOD Project. As discussed in (Timmer, Dietzenbacher, Los, Stehrer, & Vries, 2015), the advantages of WIOD over other databases are public availability and free access to time series industry-level data, full transparency on the underlying data sources and methodologies, and extensive satellite accounts with environmental and socio-economic indicators that match the industry classification for the trade tables. The data derivation and processing has been greatly facilitated by the research team at University of International Business and Economics in China. Primarily based on the accounting methods in Koopman, Wang & Wei (2014) and Wang et al. (2017), the team has constructed the UIBE GVC Index system from the major inter-country input-output databases (currently it includes data from WIOD, OECD-TiVA, GTAP and ADB-MRIO). Our measures of the US GVC participation are extracted from UIBE GVC Index dataset that is based on WIOD. WIOD Project currently has produced two dataset releases. Release 2013 consists of world input output tables for 35 industries from 40 countries (27 EU members and 13 other major countries) in the world for the period from 1995 to 2011. Release 2016 covers data from the period 2000 – 2014 with 56 industries from 43 countries (three more countries were added: Switzerland, Croatia and Norway). Unfortunately, the two datasets cannot be directly combined due to the fact that Release 2013's 35 sectors are classified according to the International Standard Industrial Classification revision 3 (ISIC Rev. 3), with its tables adhering to the 1993 version of the SNA, while Release 2016's 56 sectors are classified according to the ISIC Rev. 4, with its tables adhering to the 2008 version of the SNA. Our study will use the data based on Release 2016.

#### 4. REGRESSION MODEL AND METHODOLOGY

Within the framework of Hamermesh (1996)'s approach, we can derive the labor demand in the spirit of Amiti and Wei (2005b) from the industry production function given by:

$Y = A(fw, bw)L^\alpha K^\beta$	Eq. (3)
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Where output  $Y$  is a function of labor  $L$ , capital  $K$ . The productivity shifter  $A$  is a function of the industry's forward GVC linkage ( $fw$ ) and backward GVC linkage ( $bw$ ). An industry's productivity can benefit from backward GVC linkage as a result of increased specialization, access to more variety and higher quality of imported inputs, and stronger incentive for domestic suppliers within the same industry to lower costs under the pressure from foreign supplier competition (Criscuolo & Timmis, 2017). The returned domestic value-added components in GVCs serve as a channel to shift some efficiency dividends back to the home country after foreign firms have enjoyed the benefits of technology, know-hows and



management transfers embodied in the GVC participation. Based on the production function, a general form of the conditional labor demand can be derived from the first order conditions of the cost minimization problem. We can then specify a regression model that estimates the GVC's impact on the labor demand  $L$  as:

$$\ln L_{it} = \beta_0 + \beta_1 GVC_{it} + \beta_2 \ln Y_{it} + \beta_3 \ln w_{it} + \delta_i + u_{it} \quad \text{Eq. (4)}$$

Where  $Y$  is the industry output;  $w$  is the labor to capital compensation ratio ( $w_{it} = \frac{w_{it}}{r_{it}}$ );  $\delta_i$  is an industry fixed effect dummy, which controls for any heterogeneity across industries;  $GVC$  is an overall measure of GVC participation, which is the sum of the forward and backward linkage GVC indices,  $GVC = bw + fw$ . In the actual estimation, we also use the ratio of the forward to backward linkage GVC indices in place of  $GVC$  to measure how the GVC participation structure affects the employment.

It is highly likely that the firms engaged in downstream activities have different impacts on employment from those engaged in upstream activities in GVCs. In order to differentiate the impacts on labor demand between forward GVC linkage and backward GVC linkage, we break down GVCs and run the estimation against  $bw$  and  $fw$  as separate independent variables in a similar model setup:

$$\ln L_{it} = \beta_0 + \beta_1 bw_{it} + \beta_2 fw_{it} + \beta_3 \ln Y_{it} + \beta_4 \ln w_{it} + \delta_i + u_{it} \quad \text{Eq. (5)}$$

In our estimations in Eq. () and **Error! Reference source not found.**), we also break down GVC into simple and complex types. The 43 countries in the dataset are also classified into three groups according to the degree of economic development, which is based on the labor productivity. Each country's productivity is calculated by dividing its GDP by all persons engaged in production. The top third in the ranking is designated as high-productivity, the bottom third as low-productivity and the middle third as middle-productivity economies. We estimate the three groups separately and also as an aggregate whole in the study. The data used for our regression come from the World Input-Output database (WIOD) and its Socio-economic Accounts (SEAs) Release 2016. Release 2016 consists of world input output tables (WIOT) for 56 industries from 43 economies in the world for the period from 2000 to 2014. The backward and forward GVC linkage measures for the US against rest of the world are extracted from the UIBE GVC Index System that is based on WIOT. Data on all other economic variables for all the countries are derived from the Socio-economic Accounts (SEA Release 2016). These accounts contain industry-level data on employment, capital stocks, factor compensation, gross output and value added with the same industry classification as for the World Input Output Tables.

## 5. ESTIMATION RESULTS

The estimated results are summarized in Tables 1 and 2. As expected from the model setup, the output shows significantly positive impacts on employment, while the relative wage rate shows significantly negative impacts consistently in all model specifications. However, GVC's impact varies in different circumstances. Table 1 reports the estimation impacts of the combined GVC which is the sum of the backward and forward GVC linkage indices. Aggregating all countries in the sample, GVCs do not show any significant impacts on the employment. For high-productivity countries, however, GVCs do have a significant (at 5% level), but small positive impact when they are examined at the overall level where no distinction is made between simple

and complex GVCs. Each time the overall GVC participation index increases by one point, the employment in high-productivity countries increases by 0.12 percentage points on average. But no significant GVC impact is discovered for either middle-productivity or low-productivity countries, positive or negative. Table 2 reports the estimated results as we examine the employment impacts by separating the forward from the backward GVC linkages. Aggregating all countries as a whole, the backward GVC participation shows a significant positive impact. Each time the overall backward GVC index increases by one point, the employment increases by 0.44 percentage points. This result holds across the three country groups of different productivity. However, the forward GVC participation doesn't register any significant impacts, either positive or negative, when all countries are examined as a whole. The same is true for both high- and mid-productivity countries. The only exception is the low-productivity countries. The overall (and complex) forward GVC participation shows a significant negative impact on the employment in the low-productivity countries. Each point increase in the overall forward GVC participation lowers their employment by 0.28 percentage points on average. The negative impact is even stronger when we look at the complex version of the forward GVC participation. This result testifies to the possibility that participating in GVCs by exporting intermediate goods or services could also export downstream job opportunities to other countries. As discussed earlier, a GVC Ratio is defined as the ratio of forward participation index to the backward participation index. A higher value indicates that the country-industry is dominated by upstream production activities in that global value chain. The estimation using GVC ratio in place of the GVC variable didn't provide any significant results either from the combined GVC or its breakdown, the simple and complex versions. This result is consistent with the first part of our study, which suggests that forward GVC linkage in GVC has little impact on the domestic employment. The estimated results are not reported due to the limited space. In addition to the fixed effect model, we also run a dynamic panel data model (DPD) as part of the robustness analysis. In the DPD model, the current labor demand is assumed to be affected by the level in the previous periods. We therefore introduce the lagged dependent variable into the RHS as in Eq (6), and apply a version of GMM estimator proposed in Arellano & Bond (1991).

$$\ln L_{it} = \beta_0 + \rho \ln L_{i,t-1} + \beta_1 GVC_{it} + \beta_2 \ln Y_{it} + \beta_3 \ln w_{it} + \delta_i + u_{it} \quad \text{Eq. (6)}$$

The estimated results are very similar to the fixed effect model, with significant combined GVC impacts, significant backward GVC linkage effect and insignificant forward GVC impact, confirming a preference for the downstream activities in generating domestic job opportunities in the global value chains. The results are not reported due to the limited space.

## 6. CONCLUSION

Based on a set of comprehensive Global Value Chain (GVC) indices developed by Wang & et al (2017), this study examines the GVC's employment impact using the World Input-Output Data between 2000 and 2014 from 56 industries in 43 economies, including 28 EU members and 15 other countries. The estimation results show that the employment impact of GVC participation is a complicated one. While GVC does register some small positive impact for more advanced economies when the forward and backward GVCs are combined in the estimation, all other impacts are very weak and insignificant. The results also suggest that the backward GVCs tend to be more favorable to generating domestic job opportunities than the forward GVCs. In other words, participating in the downstream end of the global value chains are more beneficial to domestic job market than in the upstream end in general. This is particularly the case for the less developed economies, where the lost downstream job

opportunities could outweigh the added job opportunities by participating in the upstream end of global value chains.

*Table 1: Estimation – Combined GVCs' Impacts on Employment*

$\ln L_{it}$	(1) All Countries	(2) High-Productivity Countries	(3) Mid-Productivity Countries	(4) Low-Productivity Countries
<b>Overall GVCs</b>				
<b>Constant</b>	-3.630** (1.745)	.477 (1.568)	-3.090 (2.313)	2.069 (2.858)
<b>GVC<sub>it</sub></b>	-.009 (.034)	.122** (.056)	-.033 (.035)	-.052 (.068)
<b><math>\ln Y_{it}</math></b>	.481*** (.076)	.573*** (.031)	.340*** (.106)	.682*** (.029)
<b><math>\ln w_{it}</math></b>	-.519*** (.040)	-.563*** (.028)	-.439*** (.066)	-.597*** (.024)
<b>F</b>	106.48	103.32	20.24	212.83
<b>Prob &gt; F</b>	0.000	0.000	0.000	0.000
<b>Simple GVCs</b>				
<b>Constant</b>	-3.469** (1.503)	-1.184 (1.389)	-2.337 (2.263)	2.786 (2.579)
<b>GVC<sub>it</sub></b>	-.003 (.002)	-.001 (.001)	-.005 (.004)	-.005 (.005)
<b><math>\ln Y_{it}</math></b>	.481*** (.075)	.564*** (.031)	.346*** (.105)	.683*** (.029)
<b><math>\ln w_{it}</math></b>	-.518*** (.039)	-.555*** (.029)	-.444*** (.064)	-.598*** (.024)
<b>F</b>	107.91	110.72	20.24	212.06
<b>Prob &gt; F</b>	0.000	0.000	0.000	0.000
<b>Complex GVCs</b>				
<b>Constant</b>	-3.420** (1.506)	-1.147 (1.390)	-2.288 (2.261)	2.837 (2.585)
<b>GVC<sub>it</sub></b>	.002 (.002)	.002 (.002)	-.0003 (.004)	.003 (.005)
<b><math>\ln Y_{it}</math></b>	.482*** (.075)	.564*** (.031)	.347*** (.105)	.683*** (.029)
<b><math>\ln w_{it}</math></b>	-.519*** (.039)	-.555*** (.028)	-.445*** (.065)	-.598*** (.024)
<b>F</b>	106.35	105.26	19.97	212.17
<b>Prob &gt; F</b>	0.000	0.000	0.000	0.000
<b>Observations</b>	33,341	11,277	12,223	9,841
<b>Groups</b>	2,225	752	816	657

Note: Fixed effect model with time trend. Combined GVCs = forward GVC linkage index + backward GVC linkage index. Standard errors in parenthesis. \*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$ .

Table following on the next page

*Table: 2 Estimation – Forward vs. Backward GVCs' Impacts on Employment*

$\ln L_{it}$	(1) All Countries	(2) High-Productivity Countries	(3) Mid-Productivity Countries	(4) Low-Productivity Countries
<b>Overall GVCs</b>				
<b>Constant</b>	-.643 (2.365)	1.842 (1.618)	1.187 (2.773)	3.189 (2.884)
<b>GVC_b<sub>it</sub></b>	.436*** (.154)	.464*** (.106)	.541** (.248)	.562*** (.169)
<b>GVC_f<sub>it</sub></b>	-.018 (.036)	-.068 (.073)	-.033 (.036)	-.276*** (.095)
<b><math>\ln Y_{it}</math></b>	.491*** (.081)	.585*** (.032)	.351*** (.112)	.694*** (.028)
<b><math>\ln w_{it}</math></b>	-.528*** (.043)	-.573*** (.029)	-.451*** (.071)	-.609*** (.023)
<b>F</b>	93.43	85.60	17.07	191.93
<b>Prob &gt; F</b>	0.000	0.000	0.000	0.000
<b>Simple GVCs</b>				
<b>Constant</b>	-3.696** (1.573)	-1.168 (1.408)	-2.927 (2.256)	2.157 (2.748)
<b>GVC_b<sub>it</sub></b>	-.002 (.001)	-.001 (.001)	-.001 (.002)	-.004 (.005)
<b>GVC_f<sub>it</sub></b>	-.044 (.054)	.007 (.103)	-.079 (.056)	-.162 (.139)
<b><math>\ln Y_{it}</math></b>	.479*** (.075)	.564*** (.032)	.339*** (.105)	.683*** (.029)
<b><math>\ln w_{it}</math></b>	-.517*** (.039)	-.555*** (.029)	-.439*** (.065)	-.598*** (.024)
<b>F</b>	87.02	89.87	16.63	170.95
<b>Prob &gt; F</b>	0.000	0.000	0.000	0.000
<b>Complex GVCs</b>				
<b>Constant</b>	-3.640** (1.668)	-1.509 (1.480)	-2.851 (2.305)	-1.099 (2.878)
<b>GVC_b<sub>it</sub></b>	.003** (.001)	.003 (.002)	.002 (.002)	.010* (.006)
<b>GVC_f<sub>it</sub></b>	-.030 (.084)	-.083 (.155)	-.064 (.083)	-.760*** (.189)
<b><math>\ln Y_{it}</math></b>	.480*** (.076)	.564*** (.031)	.341*** (.106)	.683*** (.029)
<b><math>\ln w_{it}</math></b>	-.518*** (.039)	-.554*** (.029)	-.440*** (.066)	-.600*** (.024)
<b>F</b>	85.54	83.68	15.83	179.59
<b>Prob &gt; F</b>	0.000	0.000	0.000	0.000
<b>Observations</b>	33,341	11,277	12,223	9,841
<b>Groups</b>	2,225	752	816	657

Note: Fixed Effect model with time trend. GVC\_b and GVC\_f are backward GVC linkage and forward GVC linkage measures, respectively. Standard errors in parenthesis. \*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$ .

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