

Suciu, Marta-Christina; Petre, Adrian

Article

Telework in Romania : current state and sustainable socio-economic effects of its development

Management dynamics in the knowledge economy

Provided in Cooperation with:

National University of Political Studies and Public Administration, Bucharest

Reference: Suciu, Marta-Christina/Petre, Adrian (2022). Telework in Romania : current state and sustainable socio-economic effects of its development. In: Management dynamics in the knowledge economy 10 (1/35), S. 53 - 68.

<https://www.managementdynamics.ro/index.php/journal/article/download/445/435/>.

doi:10.2478/mdke-2022-0004.

This Version is available at:

<http://hdl.handle.net/11159/8473>

Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics

Düsternbrooker Weg 120

24105 Kiel (Germany)

E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)

<https://www.zbw.eu/>

Standard-Nutzungsbedingungen:

Dieses Dokument darf zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden. Sie dürfen dieses Dokument nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen. Sofern für das Dokument eine Open-Content-Lizenz verwendet wurde, so gelten abweichend von diesen Nutzungsbedingungen die in der Lizenz gewährten Nutzungsrechte. Alle auf diesem Vorblatt angegebenen Informationen einschließlich der Rechteinformationen (z.B. Nennung einer Creative Commons Lizenz) wurden automatisch generiert und müssen durch Nutzer:innen vor einer Nachnutzung sorgfältig überprüft werden. Die Lizenzangaben stammen aus Publikationsmetadaten und können Fehler oder Ungenauigkeiten enthalten.

Terms of use:

This document may be saved and copied for your personal and scholarly purposes. You are not to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public. If the document is made available under a Creative Commons Licence you may exercise further usage rights as specified in the licence. All information provided on this publication cover sheet, including copyright details (e.g. indication of a Creative Commons license), was automatically generated and must be carefully reviewed by users prior to reuse. The license information is derived from publication metadata and may contain errors or inaccuracies.





<https://savearchive.zbw.eu/terms-of-use>

Telework in Romania. Current State and Sustainable Socio-Economic Effects of Its Development

Marta-Christina SUCIU¹, Adrian PETRE²

¹ The Bucharest University of Economic Studies, 6 Piata Romana, 010374 Bucharest, RO;

 mcsuciu50@gmail.com

² Independent researcher, 021428 Bucharest, RO;  verwest2022@gmail.com

(corresponding author)

Received: January 4, 2022
Revised: February 10, 2022
Accepted: February 28, 2022
Published: March 18, 2022

Abstract: The main purpose of this paper is to investigate the current stage of implementation of telework in Romania and to determine potential positive and sustainable effects generated by its development on a large scale. The research methodology used is based on descriptive analysis, comparative analysis, but also on econometric analysis. The general results obtained show that Romania registers a very low level of telework employees, this being influenced, not only by the low share of those with tertiary education and high skilled professionals, but also by the fact that most Romanian employees do not want to practice this type of work. The results also showed that telework can generate significant economic and social benefits. The potential solutions we have identified for the sustainable development of the telework phenomenon in Romania include investments in tertiary education and awareness campaigns among both employees and companies, regarding the positive effects that can be obtained through telework and business development.

Keywords: telework; economic effects; education; professional status; COVID-19.

Introduction

Digitization is one of the most important phenomena that currently characterizes all major components of an economy. Technologies that are associated with this phenomenon, such as "Internet of Things" (IoT), "Artificial Intelligence" (AI), "Machine Learning" (ML), or "Big Data" (BD), are developing more and more and it also intensifies their role in the economy and social life in general. This development enables the transition from traditional business to online activity (teleworking) under a considerable extent.

Messenger et al. (2016) states that the adoption and spread of telework is an evolving process, which initially meant organizing the office at home, then reached the stage of mobile office, and finally, mainly due to the advancement of information and communication technologies (ICT) that allowed employees to work from anywhere, it reached the level of virtual office. The same conclusion was presented by Davenport and Pearlson (1998), who stated that the extension of telework is correlated with technological and ICT advancement.

Telework has existed for many years, being proposed by Nilles (1994), but did not experience a sharp development and widespread until 2020 when, due to the COVID-19 pandemic, more and more public and private institutions, in most countries of the world, have implemented this way of carrying out the activity in order to provide security to the people and to be able to ensure continuity for the main economic sectors.

According to a study conducted by Eurofound (2020a) with the COVID-19 pandemic, the percentage of the population in the European Union (EU) working from home reached 37%, well above the percentage of 5% in 2017. With this expansion of telework, "forced" by the current health crisis, private companies, but also public institutions, have adapted their organizational activity and tested

How to cite

Suciu, M. C., & Petre, A. (2022). Telework in Romania. Current State and Sustainable Socio-Economic Effects of Its Development. *Management Dynamics in the Knowledge Economy*, 10(1), 53-68. DOI 10.2478/mdke-2022-0004

ISSN: 2392-8042 (online)

www.managementdynamics.ro

<https://content.sciendo.com/view/journals/mdke/mdke-overview.xml>

the economic benefits of remote work by their employees, such as: reducing rental costs, salaries, transportation, utilities, and other operating costs.

The benefits of this type of work were also felt by most employees. Due to the transition to telework, they were able to avoid unemployment, reduced the time and costs related to daily transport to and from work or benefited from a higher autonomy and flexibility in organizing daily activities. As Wheatley (2017), Binder (2016) or Hill, Ferris and Martinson (2003) stated, the employees working through telework reported a higher motivation in carrying out their professional activity and a greater job satisfaction.

According to a study by Boogaard and Moller (2020), 82% of employees surveyed working from home due to the COVID-19 pandemic want to continue working in this way at least partially after the end of the pandemic, and in order to meet the increased demand for flexibility, many companies may offer employees the opportunity to work from home even after the pandemic is over (European Commission, 2020; Global Workplace Analytics, 2021a).

The implications of telework are not only related to companies and employees. The extension and implementation of telework in all possible fields and professions can generate positive effects in the medium and long run at macroeconomic and social level, but also for the environment. Achieving these positive effects and their intensity depend very much on the characteristics and economic and social conditions in each country. Considering all these aspects, *the main objective* that we propose in this paper is to analyze the current state of teleworking in Romania and to determine potential socio-economic effects of its development in the near future.

The article addresses the academic and the business sector, but also the policy makers involved in developing long-run, sustainable and inclusive national development strategies. After this first part of the paper, which represents an argumentation of the debated topic, in the next section we will try to make a synthesis of the scientific literature, after which we will proceed to analyze the telework phenomenon in Romania and we will determine, based on potential scenarios, its economic effects for Romanian employees. The paper concludes by presenting the general conclusions as well as the limits of the research.

Synthesis of the scientific literature

In the scientific literature there is a wide range of studies which analyze empirically the telework development globally, as well as the implications for the economy, society and environment.

One of the reference studies is the one conducted by Dingel and Neiman (2020), who estimated that approximately 37% of jobs in the United States can be turned exclusively into telework. Similar results were obtained by Boeri et al. (2020) in the case of European countries such as Germany, France, Sweden or the United Kingdom, where the proportion of jobs that can be exercised remotely is about 30%. The conclusions of these authors show that, although there is a considerable development of ICT that can support a high share of telework, there are certain factors that stand in the way of this phenomenon.

Haddon and Brynin (2005) argue that the access to ICT is only a necessary, but not sufficient, precondition for telework. Thus, according to Pyöriä (2011), Hynes (2014) and Aguilera et al. (2016) there are a number of factors, such as employer skepticism, organizational issues, employee desire, job adequacy or status issues, that may prevent the implementation of telework on a large scale.

Similar barriers were identified more than two decades ago, when Baruch and Nicholson (1997) showed that there are four types of factors on which effective development of telework depends:

individual factors (e.g., personality), job factors (e.g., technology), organizational factors (e.g., culture) and home factors (e.g., family).

Other authors, such as Vilhelmson and Thulin (2016) or Pabilonia and Vernon (2021), outlined the standard profile of the employees who carry out their professional activity through telework. The results of their study showed that those who work or can work from home through telework are those who work on permanent contracts in knowledge-based industries and have tertiary education.

There is also a growing trend of developing this phenomenon in larger urban areas and for people with above average incomes, who already have families and children. If we refer to the employees who work in knowledge-based industries, Andrei (2020) has shown that these people have adapted very quickly and easily to the new working conditions and have improved their creative and innovative abilities.

Walls, Safirova and Jiang (2007) also proves that jobs in real estate, renting or leasing are more compatible with the way of carrying out the activity through telework. At the opposite side, Dey et al. (2020) show that the percentage of employees who can easily transit to telework is lowest in the construction industry, agriculture, and hospitality. As for the gender, Sarbu (2015) stated that men had a higher probability to work from home, but women are the ones who want more to practice this way of carrying out their professional activity.

Regarding the social and economic implications of expanding telework, Bloom et al. (2020) and Grigorescu and Mocanu (2020), demonstrate that employees who perform this type of work have a higher level of job satisfaction and well-being and a higher productivity. Regarding the teleworking productivity, it depends on some variables. Kazekami (2020) says that the more the employee who works through telework is older, the productivity is higher, while Versey (2015) emphasizes the importance of the way in which the professional activity is performed: voluntary or forced. At the same time, other authors such as Ansong and Boateng (2018), Karanikas and Cauchi (2020) or Hoornweg et al. (2017) emphasize the importance of the technology reliability.

On the other hand, Delventhal et al. (2020) conducted a research based on quantitative analyzes and concluded that the main implications of the transition to telework are: the tendency of office mobility to the center of the urban area, while moving employees to the periphery (which causes a proportional change of average real estate prices, with increases in the periphery area, respectively decreases in the central locations), decrease of the traffic and travel time, as well as the increase of the welfare of the workers. Fonner and Roloff (2010) and Anderson, Kaplan and Vega (2015) also illustrated the advantage of reducing commuting time.

There are also researchers which stand out some negative effects of telework, such as: isolation and less social interaction (Hraskova & Rolkova, 2012; Stich, 2020; Mitchell, 2017; Fonner & Roloff, 2012), organizational difficulties (Montagut, Carrillo, & Delgado, 2017), presenteeism (Mann & Holdsworth, 2003; Felstead & Henseke, 2017; DeFilippis et al., 2020; Mas & Pallais, 2020) or difficulty in integrating into the organizational culture for new employees (Turetken et al., 2011; Waizenegger et al., 2020; Wojcak et al., 2016). As we can notice, the international literature suggests a clear trend of telework development globally, with more important benefits than negative effects for both employees and companies.

Research methodology

The applied research methodology consists of descriptive analysis, comparative analysis, and econometric analysis. The descriptive analysis and the comparative analysis will be used to determine the evolution of telework in Romania and to compare the situation of our country to the

other EU countries. To undertake this analysis, we will use the latest statistical data published by Eurostat for EU Member States, both in terms of occasional telework and regular telework.

The econometric analysis will be applied to determine the standard profile of telework employees in our country, as well as to determine the economic effects that may be generated by it.

First, in order to see what the standard profile is of telework employees, we will test the correlation between those employees and the following variables: tertiary education, residence, knowledge-intensive jobs and the term of employment. We will also use the multiple regression model (Eqn. 1) to test the link between telework and the four variables, depending on gender.

$$Y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_n x_{in} + \varepsilon \quad (1)$$

where, for $i = n$ observations

Y_i = dependent variable

x_i = explanatory variable

β_0 = y – intercept (constant term)

β_n = slope coefficients for each explanatory variable

ε = the model's error term

Second, in order to determine the economic impact for employees generated by telework, we will use the "Employee Savings Calculator". This is a software created by Global Workplace Analytics (2021b) which quantifies the value of net financial savings obtained by a teleworker during a year, based on the following parameters P_i (Table 1):

Table 1. Technical parameters used by Employee Savings Calculator to determine the value of the net economy obtained through telework

No.	Parameter (P_i)	Unit
1	The number of days per week in which the activity is carried out through telework	Days
2	How do you commute to work on a typical day?	Walk/Bike/Public transport/Drive with other people/Drive alone
In case of traveling with your own car		
3	The price paid per gallon of gas	USD
4	Average miles per gallon	Mpg
5	If you were to work at home, what percentage of your commuter miles would be eliminated (consider that you may need to make special trips for things you used to do during your commute)?	%
6	What do you estimate to be the cost per mile for maintenance and tires?	USD
7	Roundtrip commute in miles	Miles
8	Roundtrip commute in minutes	Minutes
In case of travel by public transport		
9	Total daily cost (round trip)	USD
10	If you drive to the transit or carpool location, how many miles do you drive roundtrip?	Miles
11	Total number of minutes of round trip to / from work	Minutes
12	The cost of parking per day	USD
13	Food / beverages per day (net of the cost you will pay for the same at home)	USD
14	Work clothes per day (divide your annual work clothes budget by 217)	USD
15	Misc. daily expenses (tolls, gifts, daycare, pools, kitty, eldercare)	USD
16	Annual additional electricity consumption used due to the fact that more time is spent at home	kWh

17	The cost paid for electricity consumption	USD/kWh
18	Reduction of the car insurance premium due to the fact that the car is used less	USD
19	Other annual savings	USD

We will use this software to determine the economic benefits for Romanian teleworkers, based on three scenarios: telework 1 day/week, telework 3 days/week and telework 5 days/week.

For all the P_i parameters we will assume values based on the characteristics of the capital Bucharest, the most developed and the most crowded city in Romania.

Telework in Romania

In this section we will focus on the analysis of the current situation of telework in Romania, as well as the potential benefits that could result from its sustainable development in the short and medium run. The analysis is performed for the period preceding the onset of the global COVID-19 pandemic, in order to capture the situation of the telework phenomenon under normal conditions and also for the first year of pandemic, to see how the situation changed under the measures required in this context.

The evolution of telework in Romania

Eurostat (2022a) show that between 2011 - 2018, the percentage of employees in Romania who carried out their professional activity through telework was very low, remaining constantly at the same level, regardless of whether we are talking about usually telework or occasional telework (Figure 1).

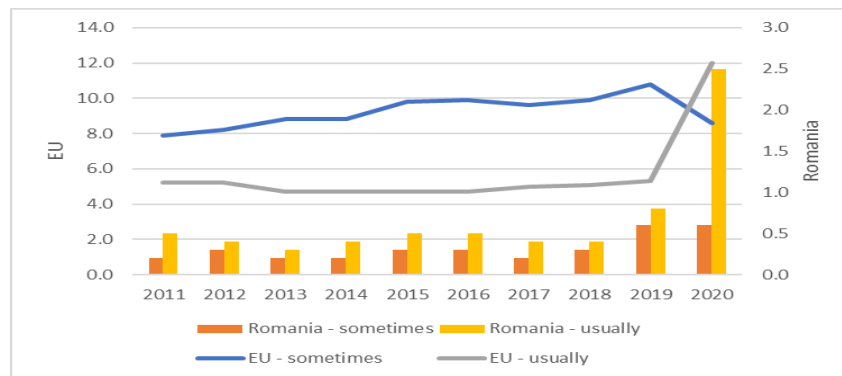
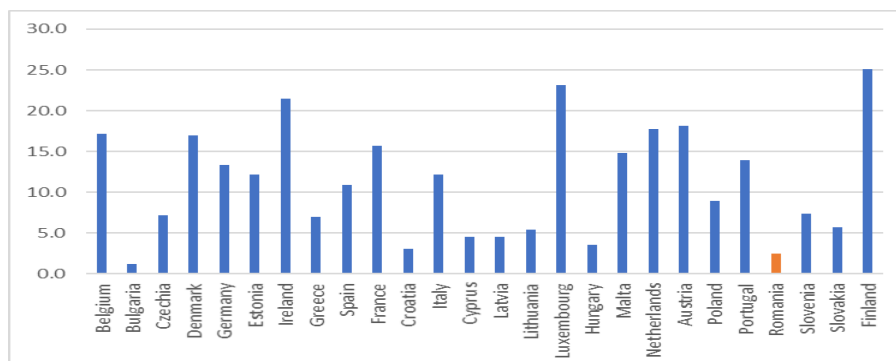


Figure 1. The evolution of the Romanian and EU employees who work from home (%)
(Own representation using data from Eurostat, 2022a)

Throughout this period, Romania was well below the EU average, especially in the case of those workers who occasionally carried out their professional activity through telework. The situation has changed since 2019, when the percentage of telework employees in our country has doubled compared to the previous year, in the case of both frequencies. It is noteworthy that in 2020, with the onset of the Covid-19 pandemic, the percentage of employees who teleworked on a regular basis has grown exponentially.

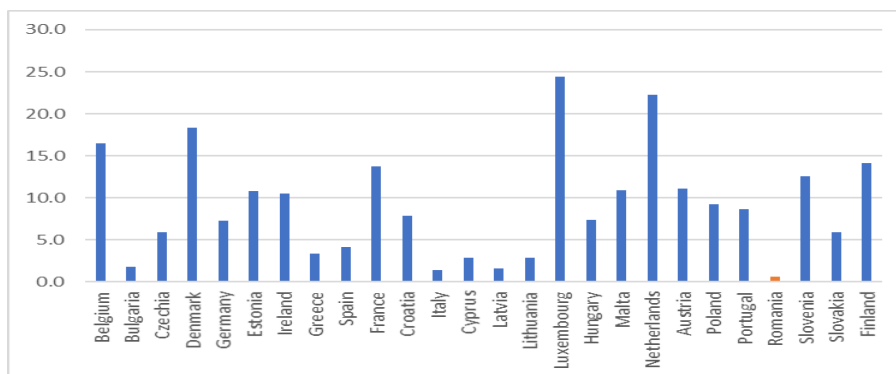
This evolution was determined by the measures imposed by the Government in the context of the health crisis, which determined many companies (especially in the service field) to carry out their activity remotely. At the EU level, the Covid-19 pandemic has caused a high increase in the percentage of employees who usually work through telework, widening at the same time the gap with our country.

Comparing the situation of our country with that of other European countries, Eurostat (2022a) data show us that at the level of 2020, Romania ranked on the penultimate place in the European Union (EU - 27), after Bulgaria, in terms of the percentage of employees who work frequently from home (Figure 2) and on the last place in view of the occasionally teleworking (Figure 3).



*Sweden was excluded due to unavailability of statistics

Figure 2. Percentage of employees who work frequently from home in 2020
(Own representation using data from Eurostat, 2022a)



*Sweden was excluded due to unavailability of statistics

Figure 3. Percentage of employees who work occasionally from home in 2020
(Own representation using data from Eurostat, 2022a)

These results force us to think about the reasons why Romania registers such a low level of telework, which is why we will further analyze this aspect.

The profile of employees who provide telework in Romania

As we have seen, international studies highlight that telework employees usually live in urban areas, have a higher education and work in knowledge-intensive sectors with a full-time employment contract.

Given these aspects, we will further apply the methodology described above in order to test whether these characteristics are also valid in the case of telework employees in Romania. The results will help us to determine some of the causes that influence the very low percentage of telework in our country. Table 2 shows the correlations between Romanian employees by level of education, professional status, type of employment contract and residence, on the one hand, and the percentage of employees who provide telework, on the other hand. The data series were collected from Eurostat (2022b, 2022c, 2022d, 2022e) and cover the period 2010-2020. For data modeling we used Eviews 12 software.

Table 2. Correlations between employees providing telework and their characteristics

	Telework total	Telework occasional	Telework usually
Tertiary education	0.546294	0.706137	0.481851
Employees with jobs involving high qualification	0.651211	0.747343	0.597174
Full-time employees	0.640356	0.754905	0.582388
Part-time employees	-0.640180	-0.754459	-0.582286
Employees living in cities	0.617389	0.741256	0.558261
Employees living in rural areas	0.470970	0.627914	0.410794

Source: Made by authors using Eviews and data collected from the Eurostat (2022b, 2022c, 2022d, 2022e)

The results presented in Table 2 confirm, in the case of Romania, the conclusions of the study conducted by Vilhelmson and Thulin (2016). Thus, we can say that, in general, employees in Romania who work through telework have tertiary education, hold positions that involve a high qualification, are full-time employees and are residents in urban areas. This assumption is valid especially for the category of persons who carry out the activity through telework only occasionally.

Regarding the segmentation of telework in Romania by gender based on the four characteristics, the results in Table 3, obtained from processing Eurostat (2022b, 2022c, 2022d, 2022e), show that there is a higher percentage of men with full-time contracts and urban residency who practice telework.

Table 3. Regression coefficients between teleworking and independent variables

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	-42.76167	86.00863	-0.497179	0.6683
Tertiary education males	-0.872284	1.559049	-0.559497	0.6321
Tertiary education females	0.496441	1.059166	0.468709	0.6854
High skilled males	-0.821615	0.936967	-0.876887	0.4730
High skilled females	2.42311	1.107495	2.187919	0.1602
Full-time males	0.286528	0.985691	0.290688	0.7987
Full-time females	0.047437	1.208804	0.039243	0.9723
Urban males	0.360451	0.507473	0.710286	0.5512
Urban females	-1.062479	0.575284	-1.846877	0.2060
R-squared	0.863004	Mean dependent var		0.936364
Adjusted R-squared	0.31502	S.D. dependent var		0.797838
S.E. of regression	0.660319	Akaike info criterion		1.939428
Sum squared resid	0.872042	Schwarz criterion		2.264978
Log likelihood	-1.666852	Hannan-Quinn criter.		1.734214
F-statistic	1.57487	Durbin-Watson stat		2.224961
Prob(F-statistic)	0.445309			

Source: Made by authors using Eviews and data collected from the Eurostat (2022b, 2022c, 2022d, 2022e)

On the other hand, although there is a relatively low influence for most of the independent variables on telework, given its low percentage, the data in Table 3 indicate a more pronounced trend of the telework phenomenon among women with tertiary education and having important professional status, which require a high qualification.

Further, the same study conducted by Vilhelmson and Thulin (2016) shows that employees who have children represent the group with one of the fastest ascents in terms of organizing professional activity through telework. The statistics of Eurostat (2022f) indicate that the situation described by the two authors is also similar in the case of Romania (Figure 4).

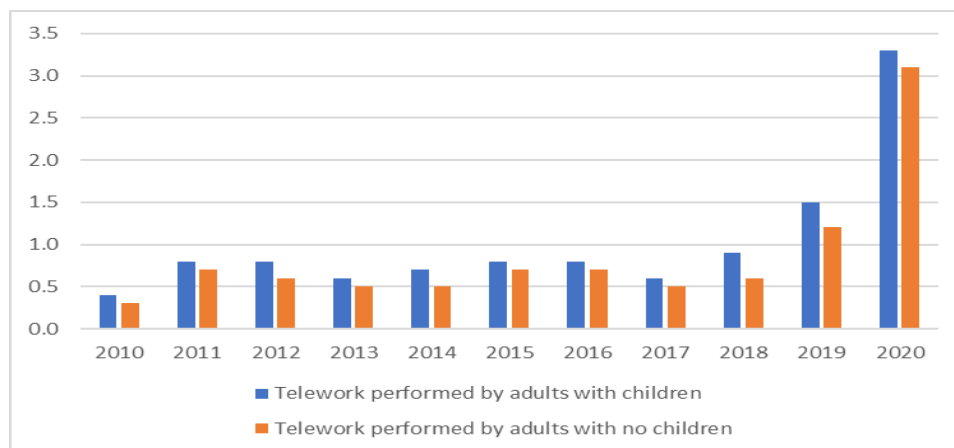


Figure 4. Percentage of employees who work through telework, according to household structure
(Own representation using data from Eurostat, 2022f)

The data in the chart above show that in Romania the percentage of adults who have children and work through telework is higher compared to that of adults who work similarly, but do not have children. This shows that in the case of the former, the benefit of work-family balance is more obvious and important and for this reason they emphasis more on working from home.

All these results demonstrate that, in terms of general characteristics, Romania is basically in line with the standard pattern of employees working through telework. However, as we saw above, in Figures 2 and 3, telework in Romania today is ranking at the bottom in the group of the EU Member States.

Using Eurostat (2022b, 2022c), we can assume that one of the reasons is that the percentages of employees with tertiary education and those employed in positions involving a high level of training are one of the lowest in the European Union (Figure 5 and Figure 6).

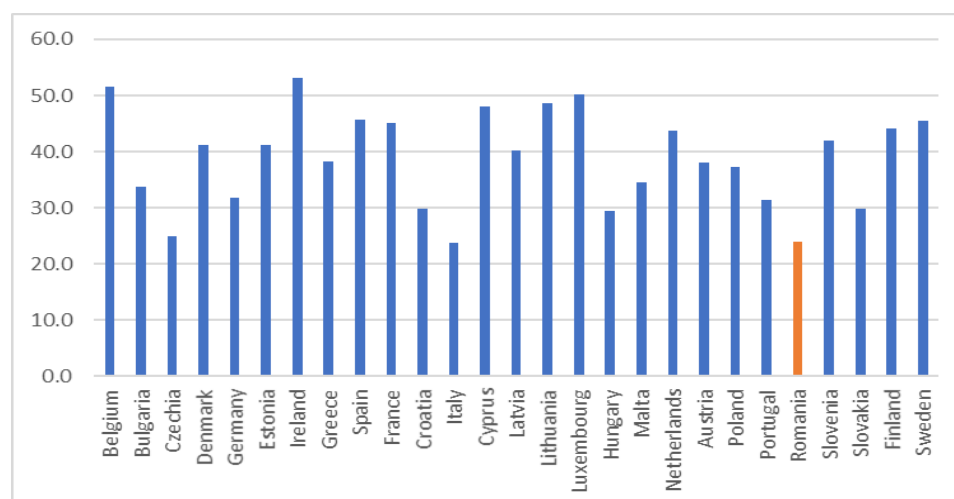


Figure 5. Percentage of employees with tertiary education in EU - 27, in 2020
(Own representation using data from Eurostat, 2022b)

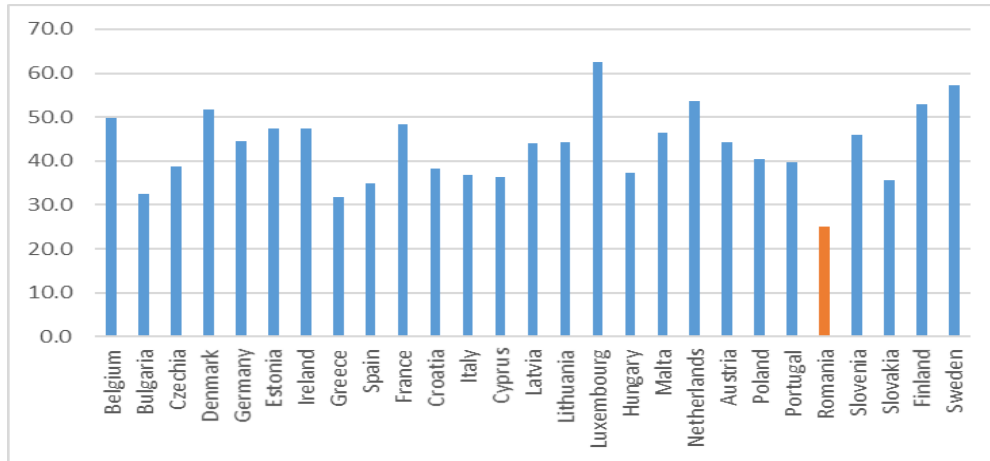
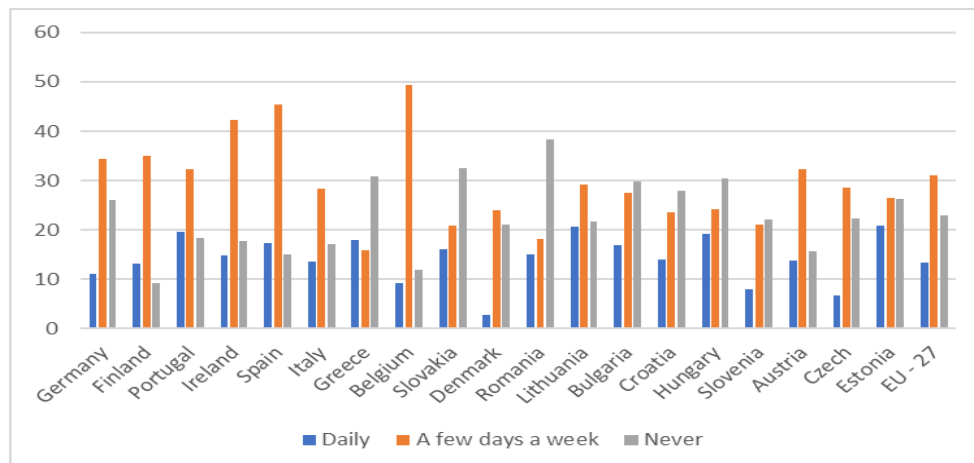


Figure 6. Percentage of employees in positions requiring high skills in EU-27, in 2020
(Own representation using data from Eurostat, 2022c)

There is also a subjective cause of the low level of teleworking in Romania. According to Eurofound (2020b), the percentage of employees who stated that they never want to work from home is 38.3%, the highest level in the European Union (Figure 7).



Note: Cyprus, France, the Netherlands, Poland, Malta, Sweden, Latvia, and Luxembourg were excluded from the chart due to insufficient data

Figure 7. Preferences of employees in the European Union regarding telework
(Own representation using data from Eurofound, 2020b)

A possible explanation for this situation is that employees in Romania are not fully aware of the advantages they could obtain as a result of carrying out the activity through telework.

Given these issues, we will further try to quantify some of these benefits.

The economic impact for employees generated by telework

In this section, we will try to determine the economic impact of telework on employees, expressed by the value of the annual net savings that can be recorded by them.

In this regard, we will use the “Employee Savings Calculator”.

As we stated in the Methodology section, the determination of the annual net financial economy value in the case of employees working by the telework method will be made based on three probable scenarios, based on the data in Table 4.

Hypotheses:

- In the case of P₁ we assumed that telework is used one day a week in scenario 1, 3 days in scenario 2, respectively 5 days in scenario 3. In the case of P₂, we took into account the transport to and from work with the personal car, considering that the official statistics indicate in the period 2018 - 2019 for Romania the second largest increase in the European Union of the number of registered cars, plus 23,4% (http://acarom.ro/wpcontent/uploads/2020/01/20200116_PRPC_1912_FINAL.pdf, respectively an increase in traffic congestion by 4% in the same period (https://www.tomtom.com/en_gb/traffic-index/bucharest-traffic/))
- In the case of P₃ the values were calculated based on the average price of a gallon of petrol and diesel from November 2020 to February 2021 (according to Peco Online website: <https://www.peco-online.ro/istoric.php>).
- In the case of P₄ we took into account an average consumption of 50 miles/gallon (according to statistical data presented by Ziarul Financiar: <https://www.zf.ro/auto/exclusiv-on-line-care-sunt-masinile-cu-cel-mai-redus-consum-de-carburant-din-romania-6105444>)
- In the case of P₅ we assumed a percentage of 50% of the exempted miles due to the development of telework (we took into account the fact that most adults use in these conditions the car to transport children to school and to purchase various goods).
- In the case of P₆ we took into consideration an average annual cost of 292 USD for changing tires and an average cost of 729 USD for vehicle maintenance, and the total resulting cost was divided by 12.427 miles (average distance assumed for travel within a year).
- In the case of P₇ and P₈ we took into account an average distance of 18,64 miles from home to work and a normal time to cover this distance of 30 minutes, to which we added another 15 minutes to include in the calculation the periods of the day in which the traffic is heavy.
- In the case of P₉, P₁₀ and P₁₁ no values were determined because our analysis does not refer to people commuting by public transport.
- In the case of P₁₂, we took into account the fact that most office locations have free parking for employees, and most of those who do not work in such locations park in public places free of charge. We have included a daily cost of 2,43 USD for those who park in areas with a parking fee (daily payment or subscription).
- In the case of P₁₃ we assumed an average daily cost for providing office food of 4,86 USD and the fact that this meal can be prepared at home for only 2,43 USD.
- In the case of P₁₄ we assumed an average annual cost of 972 USD.
- In the case of P₁₅ we set an average cost of 2,43 USD which includes road tax and care products.
- In the case of P₁₆ we assumed a 30% increase in electricity consumption compared to the annual average of 600 kWh / person (according to the Directorate-General for Justice and Consumers).
- In the case of P₁₇ we took into account the price offered in 2020 by CEZ for household customers in Muntenia Sud supply area, respectively 0,07 USD / kWh.
- In the case of P₁₈ and P₁₉ we did not take into account the decrease of the car insurance value, respectively other general expenses.
- For the equivalence of the monetary values in USD we used the exchange rate of 4,1136 RON / USD.

The results obtained from processing the data in Table 4 using the "Employee Savings Calculator" software show that a Romanian employee who falls into scenario 1 and generally uses his own car to get to and from work can save about 705 USD annually as a result of working from home for one day a week. Also, such an employee would save about 9 days of his time annually, which is normally lost due to the commute.

In scenario 2, an employee who works from home 3 days a week will manage to save approximately 2.140 USD annually, and the time exempted with the commute would be approximately 28 days.

Table 4. Scenarios for determining the value of the net economy obtained on the basis of telework

No.	Parameter	Scenario 1	Scenario 2	Scenario 3
1	The number of days per week in which the activity is carried out through telework	1	3	5
2	How do you commute to work on a typical day?	Drive alone	Drive alone	Drive alone
In case of traveling with your own car				
3	The price paid per gallon of gas	5,45 USD/gal	5,45 USD/gal	5,45 USD/gal
4	Average miles per gallon	50 miles/gal	50 miles/gal	50 miles/gal
5	If you were to work at home, what percentage of your commuter miles would be eliminated (considered that you may need to make special trips for things you used to do during your commute)?	50%	50%	50%
6	What do you estimate to be the cost per mile for maintenance and tires?	0.08 USD/mile	0.08 USD/mile	0.08 USD/mile
7	Roundtrip commute in miles	18,64 miles	18,64 miles	18,64 miles
8	Roundtrip commute in minutes	90 minutes	90 minutes	90 minutes
In case of travel by public transport				
9	Total daily cost (round trip)	-	-	-
10	If you drive to the transit or carpool location, how many miles do you drive roundtrip?	-	-	-
11	Total number of minutes of round trip to / from work	-	-	-
12	The cost of parking per day	2,43 USD	2,43 USD	2,43 USD
13	Food / beverages per day (net of the cost you will pay for the same at home)	2,43 USD	2,43 USD	2,43 USD
14	Work clothes per day (divide your annual work clothes budget by 217)	4,48 USD	4,48 USD	4,48 USD
15	Misc. daily expenses (tolls, gifts, day-care, pools, kitty, eldercare)	2,43 USD	2,43 USD	2,43 USD
16	Annual additional electricity consumption used due to the fact that more time is spent at home	180 kWh	180 kWh	180 kWh
17	The cost paid for electricity consumption	0,07 USD/kWh	0,07 USD/kWh	0,07USD/kWh
18	Reduction of the car insurance premium due to the fact that the car is used less	0 USD	0 USD	0 USD
19	Other annual savings	0 USD	0 USD	0 USD

Source: Parameters determined by the authors

Finally, the employee who is part of scenario 3 can save approximately 3.600 USD annually and time of approximately 47 days. All these benefits can be obtained by employees who fall within the general profile established by us through the assumptions stated above.

However, the financial benefits of telework can be even greater if we consider a reduction in the car insurance premium, given that the car is used less. At the same time, certain categories of people can

experience other types of savings as they carry out their activity through telework. For example, people who pay rent to be closer to work can save those amounts as a result of the transition to telework. Savings can be made with medical services, given that people who no longer have to go to work every day are no longer exposed to high pollution, traffic stress or other hazards that could affect their health.

Further, if we look at the evolution of the price paid per gallon of gas in our country, we will see that it is on an upward trend, so we can assume that savings will be even bigger the more a person works through telework. Higher savings will be obtained also in the case of those employees that go beyond the standard profile set by us and spend higher amounts on food, clothing and care when they work from office.

On the other hand, even if we assume that a person travels to work with his own car accompanied by another person, the only expenses that can be reduced are those with fuel, which do not greatly influence the overall cost.

Discussions

As we can see, the economic benefits of telework are considerable. Our results show that the more a person carries out his professional activity through telework, the greater his savings in terms of time and money will be. Thus, the money saved from transportation, food, cosmetics and clothing or extra health services can be used for other types of investments or expenses that can help to increase the living standard. Also, the extra time obtained as a result of eliminating the commute can be used for more family activities, relaxation, training or other personal activities.

Such advantages are expected also in other European countries, with the expansion of telework. For example, according to a study by the European Parliament (2021), countries such as Germany, Finland or Ireland identify as one of the main advantages of telework the reduction of commuting time, while in addition to this, Italy highlights the costs reduction. Along with these, other types of benefits are generated, such as: reduced stress levels (as a consequence of exemption from time spent in traffic), greater employment opportunities (for example in the case of people with locomotor disabilities).

The benefits of working through telework are not just for employees. The extension of this practice also generates important sustainable benefits for companies (for example by reducing costs related to workspaces rent and maintenance) or for the environment (reducing pollution generated by heavy traffic). For example, according to a study conducted by Batut and Tabet (2020) in France, an average of approximate three days of remote work per week would decrease the environmental impacts of commuting by approximately 30%, meaning 3,7% of greenhouse gas emissions.

We believe that measures need to be taken at both governmental and business level to raise awareness of these positive effects of telework and to implement concrete strategies to gradually increase the percentage of teleworkers in those economic sectors where this transition is possible.

These strategies must include measures to stimulate tertiary education among Romanians, as a primary condition, as well as measures to develop the business environment in the medium and long run, so as to allow the development of as many jobs as possible that involve a high qualification.

Conclusions

This article is a contribution to research to date on the evolution and effects of telework on people, both economically and socially. The main objective of this research was to highlight the current stage of telework development in Romania and to determine some of the potential benefits that could be generated for employees as a result of the widespread application of this way of carrying out the

professional activity. We consider that through the organization of research and based on the applied research methodology we managed to achieve this goal.

The results obtained by us confirmed, on the one hand, the results highlighted by other authors who conducted similar studies for other countries, and on the other hand, the results showed the differences between Romania and the other countries in the European Union. Even if the profile of employees in Romania is generally in line with the standard profile of teleworkers that was identified in the literature, and the economic and social benefits stated are considerable, there are certain causes that prevent the development of this activity in our country.

The causes identified by us are represented by the low percentage of employees with tertiary education and those who have positions that involve a high level of skills, as well as the low preferences of Romanians towards this change. It is imperative that telework be extended to our country and to benefit as much as possible from its advantages, but for this we need an adequate involvement from both policy makers and companies and employees.

The research presents a series of limitations from the point of view of the official statistical data in the case of Romania related to certain parameters necessary to determine the value of the net economy, but we claim that the values assigned by us characterize a standard employee.

A new line of research related to this topic will be the setting of concrete benefits for companies and environment, as a result of a bigger opening for this type of activity. We will also extend the present analysis by determining the benefits of telework for a person who travels to work by public transport.

References

- Aguilera, A., Lethiais, V., Rallet, A., & Proulhac, L. (2016). Home-based telework in France: Characteristics, barriers and perspectives. *Transportation Research Part A: Policy and Practice*, 92(C), 1–11.
- Ansong, E., & Boateng, R. (2018). Organisational adoption of telecommuting: Evidence from a developing country. *Electronic Journal of Information Systems in Developing Countries*, 84(1), 1–15.
- Anderson, A. J., Kaplan, S. A., & Vega, R. P. (2014). The impact of telework on emotional experience: When, and for whom, does telework improve daily affective well-being? *European Journal of Work and Organizational Psychology*, 24(6), 882–897. <https://doi.org/10.1080/1359432x.2014.966086>
- Andrei, A. M. (2021). Teleworking, Teamwork and Transactive Memory during the COVID-19 Outbreak. *Management Dynamics in the Knowledge Economy*, 9(3), 393–403. <https://doi.org/10.2478/mdke-2021-0026>
- Baruch, Y., & Nicholson, N. (1997). Home, Sweet Work: Requirements for Effective Home Working. *Journal of General Management*, 23(2), 15–30. <https://doi.org/10.1177/030630709702300202>
- Batut, C., & Tabet, Y. (2020). *What do we know about the economic effects of remote work?*, Direction générale du Trésor, Trésor-Economics, No. 270, November.
- Binder, M., & Coad, A. (2016). How satisfied are the self-employed? A life domain view. *Journal of Happiness Studies*, 17(4), 1409–1433.
- Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, 130(1), 165–218.
- Boeri, T., Caiumi, A., & Paccagnella, M. (2020). Mitigating the work-security trade-off while rebooting the economy. *Covid Economics, Vetted and Real-Time Paper, CEPR*, 2, 60–66.
- Boogaard, J., & Moller, S. (2020). *Exploring the Post-COVID-19 Workplace*. Colliers International <https://www2.colliers.com/en-hr/research/exploring-the-post-covid19-workplace>
- Davenport, T.H., & Pearlson, K. (1998). Two cheers for the virtual office. *MIT Sloan Management Review*, 39, 51–65.
- Delventhal, M., Kwon, E., & Parkhomenko, A. (2020). How Do Cities Change When We Work from Home? *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3746549>

- DeFilippis, E., Impink, S., Singell, M., Polzer, J. T., & Sadun, R. (2020). Collaborating During Coronavirus: The Impact of COVID-19 on the Nature of Work. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3654470>
- Dey, M., Frazis, H., Loewenstein, M.A., & Sun, H. (2020). Ability to work from home: evidence from two surveys and implications for the labor market in the COVID-19 pandemic. *Monthly Labor Review*, June. <https://www.bls.gov/opub/mlr/2020/article/ability-to-work-fromhome.htm>
- Dingel, J., I., & Neiman, B. (2020). *How many jobs can be done at home?*. NBER Working Paper Series, National Bureau of Economic Research, 26948.
- Eurofound. (2020a). *Living, Working and COVID-19. First Findings*. Publications Office of the European Union. https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef20058en.pdf
- Eurofound. (2020b). *Living, working and COVID-19 dataset*. <http://eurofound.link/covid19data>
- European Automobile Manufacturers Association. (2021, March 23). New Passenger Car Registrations European Union. http://acarom.ro/wpcontent/uploads/2020/01/20200116_PRPC_1912_FINAL.pdf
- European Commission's Science and Knowledge Center. (2021, April 15). *Telework in the EU Before and After the COVID-19: Where We Were, Where We Head to*. European Commission. https://ec.europa.eu/jrc/sites/default/files/jrc120945_policy_brief_-_covid_and_telework_final.pdf
- European Parliament. (2021). *The impact of teleworking and digital work on workers and society*. [https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662904/IPOL_STU\(2021\)662904_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662904/IPOL_STU(2021)662904_EN.pdf)
- Eurostat. (2022a). *Employed persons working from home as a percentage of the total employment, by sex, age and professional status*. https://ec.europa.eu/eurostat/web/products-datasets/-/LFSA_EHOMP
- Eurostat. (2022b). *Employment by educational attainment level*. https://ec.europa.eu/eurostat/web/products-datasets/-/lfsi_educ_a
- Eurostat. (2022c). *Employment by sex, age, professional status and occupation*. https://ec.europa.eu/eurostat/web/products-datasets/-/lfsq_egais
- Eurostat. (2022d). *Employment by sex, age, professional status and full-time/part-time*. https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsq_eftpt
- Eurostat. (2022e). *Employment rates by sex, age, educational attainment level, citizenship and degree of urbanization*. https://ec.europa.eu/eurostat/databrowser/view/lfst_r_erednu/default/table?lang=en
- Eurostat. (2022f). *Percentage of employed people working at home by sex, age groups and household composition*. https://ec.europa.eu/eurostat/web/products-datasets/-/lfst_hhwahty
- Felstead, A., & Henseke, G. (2017). Assessing the growth of remote working and its consequences for effort, well-being and work-life balance. *New Technology, Work and Employment*, 32(3), 195–212. <https://doi.org/10.1111/ntwe.12097>
- Fonner, K. L., & Roloff, M. E. (2010). Why Teleworkers are More Satisfied with Their Jobs than are Office-Based Workers: When Less Contact is Beneficial. *Journal of Applied Communication Research*, 38(4), 336–361. <https://doi.org/10.1080/00909882.2010.513998>
- Fonner, K. L., & Roloff, M. E. (2012). Testing the Connectivity Paradox: Linking Teleworkers' Communication Media Use to Social Presence, Stress from Interruptions, and Organizational Identification. *Communication Monographs*, 79(2), 205–231. <https://doi.org/10.1080/03637751.2012.673000>
- Global Workplace Analytics. (2021a). *Work-at-Home after Covid-19 - Our Forecast*. <https://globalworkplaceanalytics.com/work-at-home-aftercovid-19-our-forecast>
- Global Workplace Analytics. (2021b). *Employee Savings Calculator*. <https://globalworkplaceanalytics.com/employee-savings-calculator>
- Grigorescu, A., & Mocanu, N.A. (2020). Teleworking perspectives for Romanian SMEs after the COVID-19 pandemic. *Management Dynamics in the Knowledge Economy*, 8(4), 383–399.
- Haddon, L., & Brynin, M. (2005). The character of telework and the characteristics of teleworkers. *New Technology, Work and Employment*, 20(1), 34–46. <https://doi.org/10.1111/j.1468-005x.2005.00142.x>
- Hill, E., Ferris, M., & Martinson, V. (2003). Does it matter where you work? A comparison of how three work venues (traditional office, virtual office, and home office) influence aspects of

- work and personal/family life. *Journal of Vocational Behavior*, 63(2), 220–241. [https://doi.org/10.1016/s0001-8791\(03\)00042-3](https://doi.org/10.1016/s0001-8791(03)00042-3)
- Hoornweg, N., Peters, P., & van der Heijden, B. (2017). *Finding the optimal mix between telework and office hours to enhance employee productivity: A study into the relationship between telework intensity and individual productivity, with mediation of intrinsic motivation and moderation of office hours*. *New Ways of Working Practices* (pp. 1–28). Emerald Group Publishing Limited.
- Hynes, M. (2014). Telework Isn't Working: A Policy Review. *The Economic and Social Review*, 45(4), 579–602.
- Hraskova, D., & Rolkova, M. (2012). Teleworking, a Flexible Conception of Managing the Enterprise. In *Proceedings of the 2nd International Scientific Conference "Whither Our Economies"* (pp. 39-45). Mykolas Romeris University, Vilnius, Lithuania.
- ILOSTAT. (2021). *Employment by occupation*. https://www.ilo.org/ilostatfiles/Documents/description_OCU_EN.pdf
- Karanikas, N., & Cauchi, J. (2020). Literature review on parameters related to work-from-home (WFH) arrangements. *QUT ePrints*. <https://eprints.qut.edu.au/205308/>
- Kazekami, S. (2020). Mechanisms to improve labor productivity by performing telework. *Telecommunications Policy*, 44(2), 101868. <https://doi.org/10.1016/j.telpol.2019.101868>
- Mann, S., & Holdsworth, L. (2003). The Psychological Impact of Teleworking: Stress, Emotions and Health. *New Technology, Work and Employment*, 18(3), 196-211.
- Mas, A., & Pallais, A. (2020). Alternative work arrangements. *Annual Review of Economics*. 12(1), 631– 658.
- Messenger, J., & Gschwind, L. (2016). Three generations of Telework: New ICTs and the (R)evolution from Home Office to Virtual Office. *New Technology Work and Employment*, 31(3), 195–208.
- Mitchell, D. (2017). *50 Top Tools for Employee Engagement: A Complete Toolkit for Improving Motivation and Productivity*. Kogan Page.
- Montagut, W.V., Carrillo, L.P.V., & Delgado, M.D.P.S. (2017). Model for implementation of teleworking in software development organizations. *Sistemas Telemática*, 15(1), 29–44.
- Nilles, J. M. (1994). *Making Telecommuting Happen*. VNR.
- Pabilonia, S.W. and Vernon, V. (2021). *Telework, wages, and time use in the United States*. GLO Discussion Paper No. 546.
- Peco Online (2021). Peco Online. <https://www.peco-online.ro/istoric.php>.
- Pyöriä, P. (2011). Managing telework: Risks, fears and rules. *Management Research Review*, 34(4), 386–399.
- Sarbu, M. (2015). Determinants of Work-at-Home Arrangements for German Employees. *Labour*, 29(4), 444–469.
- Stich, J.-F. (2020). A review of workplace stress in the virtual office. *Intelligent Buildings International*, 12(3), 208-220.
- TomTom Traffic Index. (2021). *Bucharest traffic report*. https://www.tomtom.com/en_gb/traffic-index/bucharest-traffic/
- Turetken, O., Jain, A., Quesenberry, B., & Ngwenyama, O. (2011). An empirical investigation of the impact of individual and work characteristics on telecommuting success. *IEEE Transactions on Professional Communication*, 54(1), 56–67.
- Versey, H. S. (2015). Managing work and family: Do control strategies help? *Developmental Psychology*, 51(11), 1672–1681. <https://doi.org/10.1037/a0039607>
- Vilhelmson, B., & Thulin, E. (2016). Who and where are the flexible workers? Exploring the current diffusion of telework in Sweden. *New Technology Work and Employment*, 31(1), 77–96.
- Waizenegger, L., McKenna, B., Cai, W., & Bendz, T. (2020). An affordance perspective of team collaboration and enforced working from home during COVID-19. *European Journal of Information Systems*, 29(4), 429–442.
- Walls, M., Safirova, E., & Jiang, Y. (2007). What Drives Telecommuting? *Transportation Research Record: Journal of the Transportation Research Board*, 2010(1), 111–120. <https://doi.org/10.3141/2010-13>
- Wheatley, D. (2017). Employee satisfaction and use of flexible working arrangements. *Work Employ & Society*, 31(4), 567–85.
- Wojcak, E., Bajzikova, L., Sajgalikova, H., & Polakova, M. (2016). How to achieve sustainable efficiency with teleworkers: Leadership model in telework. *Procedia: Social and Behavioral Sciences*, 229, 33–41.

Ziarul Financiar. (2021). *Care sunt masinile cu cel mai redus consum de carburant din Romania.*
<https://www.zf.ro/auto/exclusiv-on-line-care-sunt-masinile-cu-cel-mai-redus-consum-de-carburant-din-romania-6105444>

© 2022 Author(s). This is an open-access article licensed under the Creative Commons Attribution-NonCommercial-NoDerivs License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).