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Article

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The Effects of Foreign Agri-food Trade Liberalization in South East Europe[1]

Bojan MATKOVSKI – Boris RADOVANOV** – Stanislav ZEKIC**

Abstract

Market liberalization in the countries of South East Europe (SEE), which was a consequence of free trade agreements with the European Union (EU) and the countries of the Central European Free Trade Agreement (CEFTA), led to changes in foreign trade flows of these countries' agri-food products. As agri-food products are a significant part of total foreign trade in these countries, the objective of this paper is to analyze the liberalization effects established by CEFTA and EU integration. A gravity model for panel data was estimated for the agri--food sector of all SEE countries for the period 2005 – 2015, and databases from UN Comtrade and the World Bank were used to create an empirical base for this study. The results confirmed the importance of CEFTA integration, which made a significant contribution to imports and exports within this sector in most SEE countries. Additionally, the results showed that the Stabilization and Association Agreement (SAA) with the EU had limited effects on the import and export of agri-food products in SEE countries.

Keywords: *agri-food products, foreign trade, gravity model, SEE countries, EU, CEFTA*

JEL Classification: Q17, Q18, F15

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Introduction

The economic and political transformations that occurred in the countries of South East Europe (SEE)[2] in the late 20th century, including the transition from a centrally-planned to market-oriented economy and the disintegration of the former Yugoslavia, had a considerable influence on the entire region. After a dynamic period of transition, all SEE countries elected to begin the process of negotiations for accession to the European Union (EU). This is very long and difficult process for these countries, and according to the experiences of countries that recently became members of the EU, the EU accession processes last an average of 8 years. In the case of SEE countries, however, this could last even longer (Erjavec, 2007). Croatia became full member of the EU in 2013, while the other countries are in different stages of negotiations: Serbia, FYR Macedonia, Montenegro, and Albania are candidate countries, while Bosnia and Herzegovina (B&H) is still classified as a potential candidate. Although Croatia became a full member of the EU and is no longer classified as one of the SEE countries according to EU terminology, Croatia will also be considered a SEE country in this paper, due the period of analysis in our research.

The integration of SEE countries into the EU began with Autonomous Trade Measures (ATMs), which enabled the export of agri-food products to EU countries without barriers, with the exceptions of sugars, beef, wine, and trout. The ATMs are asymmetric trade measures that favor the SEE countries, and the Stabilization and Association Agreement (SAA) is a trade agreement that gradually created a free trade zone between the EU and SEE countries. After a transition period of approximately six years, the SAA allowed SEE countries to import from EU countries without barriers, which led to a more symmetric trade regime. As is illustrated in Table 1, the application of the SAA in the SEE countries was asynchronous, and in Serbia and B&H the Interim Agreement on trade and trade related issues had entered into force before SAA. However, this agreement is crucial for foreign trade.

The aim of the Central European Free Trade Agreement (CEFTA) was to both improve regional cooperation and to prepare for membership in the EU. CEFTA also led to the establishment of a free trade zone between SEE countries and Moldova (Croatia left CEFTA after accession to the EU). CEFTA is a temporary, sub-regional, and regional trade integration: when certain countries enter the EU they are required to withdraw from CEFTA. Regional cooperation is very

[2] South East Europe (SEE) is a political and geographical region located primarily in the Balkan Peninsula. The six countries discussed in this paper (Serbia, Bosnia and Herzegovina, Croatia, FYR Macedonia, Montenegro and Albania) were chosen for political and economic reasons. This region is also referred to as the Western Balkans.

important for future relations with the EU, and it is an essential means of strengthening agricultural and rural development, which consequently can enhance economic growth in the region (Bajramovic et al., 2016).

T a b l e 1

Years SEE Countries Established Free Trade Agreements

	ATMs	SAA	CEFTA
Serbia	2003	2010	2007
B&H	2000	2008	2007
Croatia	2000	2005	2007
FYR Macedonia	2000	2004	2007
Montenegro	2003	2010	2007
Albania	2000	2009	2007

Source: European Commission (2017) and CEFTA (2017).

The processes of integration are followed by market liberalization, which includes the market of agri-food products. When combined with the liberalization of trade in agri-food products, this poses a serious competitive threat to the survival of the market of domestic producers due to the lag in their levels of production, productivity, and price competitiveness (Nestorov-Bizonj, Kovljenic and Erdelji, 2015). According to Erjavec et al. (2014), agriculture still ranks as one of the most important sectors of the national economy in SEE countries, and it makes significant contributions to economic and social stability. However, factor productivity in these countries is significantly lower than the EU average, mostly due to slow far consolidation processes and inefficient use of the production factor. Furthermore, according to these authors, agri-food chains face problems in creating market institutions; establishing marketing and distribution chains; and meeting EU quality, veterinary, health and hygiene, and phyto-sanitary standards. Because of this, the quality of institution types is very important as they affect agricultural and food exports differently (Bojnec and Ferto, 2015). In less economically developed countries like the SEE countries, where a considerable proportion of the rural population still depends on agriculture as its primary source of income, an increase in competitiveness is crucial for enhancing the viability of rural areas and reducing the poverty gap between urban and rural populations (Lovre, 2016). For these reasons, good pre-accession policy as well as market adjustment are crucial tasks for SEE countries during the accession process.

Since EU membership is the unquestioned political direction for all SEE countries, a complementary agricultural policy and growth in agricultural competitiveness will be fundamental imperatives for national policies (Zekic and Matkovski, 2014). The experiences of newer EU member states is a valuable for

SEE countries, and some previous studies have shown that these countries have used their possibilities to varying extents: the countries focusing on high value added products (milk, fruit, and vegetables) were the winners of accession while countries concentrating on bulk cereals lost with this strategy (Jambor, Somai and Kovacs, 2016). Because of that, increased competitiveness of domestic agricultural production and processing industries in SEE countries will represent a base for improving the balance of agri-food trade through an increase in productivity (Zekic and Matkovski, 2015). One excellent opportunity for this is the export of organic food products due to the expanding global organic food market (Grubor, Djokic and Milicevic, 2017).

All SEE countries have a growing and relatively significant share of agri-food product exports in terms of total exports. The most important export and import markets are EU countries and the CEFTA region (i.e., other SEE countries). The exceptions are Montenegro, where foreign trade of agri-food products is mainly focused on the region, and Albania, for whom the EU is the main trading partner for the agricultural sector. This is particularly true when it comes to food exports. Serbia is the only country which has a positive foreign trade balance for agri-food products, while Albania, Montenegro, and B&H have a noticeable deficit in the trade of these products (UN Comtrade, 2017).

Despite the SEE countries' good comparative advantages in the agricultural sector, performances in these countries are noticeably worse than in EU countries (Matkovski, Djokic and Zekic, 2016). Also, exports from EU candidate countries to EU countries are highly concentrated around a few of the most important products with trade specialization and primary bulk raw commodities, which are related to natural factor endowments (Bojnec and Ferto, 2010). The main problem in these countries is the lack of a stable agricultural policy and a true strategy for reforms and adjustments to EU requirements (Volk, Rednak and Erjavec, 2012).

Since all SEE countries aspire to full membership in the EU, the issue of effects on the agricultural sector is becoming increasingly important. The reason for this is the specific importance of agriculture within these countries' economies, which is reflected in the share of agriculture in employment, the creation of GDP (Gross Domestic Products), and the foreign trade balance. The main motivation behind this study is to answer the question of how the process of euro integration will affect the agricultural sectors in these countries, and more specifically how it will affect agro-food products' foreign trade performance. Because full membership includes access to the Common Market, the processes of trade liberalization during the pre-accession period can be an adequate guideline for the effects that can be expected after EU accession. Therefore, the focus of this

study is to identify the effects of EU integration on the agricultural sector in SEE countries and to make recommendations for formulating adequate measures for foreign trade policy and a policy to support agriculture. Taking all of this into consideration, the main objective of this paper is to analyze the effects of liberalization on foreign trade in the agri-food sector of SEE countries as established by agreements with the EU and CEFTA countries.

The paper consists of three sections. Following the introduction, the first section reviews the literature on the gravity model as the study's theoretical basis. The second section illustrates the materials and methods used in this study, and the third section presents results and discussion. The first part of the results includes export and import performances of agri-food products and net-export, followed by the results of the gravity model of the panel of agri-food products. The conclusion will include a consideration of future trends in the SEE countries' foreign trade of agri-food products.

1. Literature Review

The concept of the gravity model is analogous to Newton's law of gravity, in the sense that trade flow between two countries is proportional to the economic mass of each country and inversely proportional to the distance between two centers of gravity. The basic form of this model was established by Tinbergen (1962), and a number of specifications for the gravity model have been derived and used for the effects of liberalization (e.g., Bergstrand, 1985; Deardorff, 1998; Anderson and van Wincoop, 2003; Baier and Bergstrand, 2007; Grant and Lambert, 2008).

According to the gravity model, foreign trade between two countries is directly proportional to these countries' GDP and reversely proportional to their distance. More specifically, the gravity model estimates changes in trade flows as a consequence of changes in GDP and population. Other trade conditions are also included in the model: distance; shared borders; PTAs; cultural, historical, and linguistic similarities; etc.

The gravity model has become particularly popular in the literature since the disintegration of Soviet Union. The aim of its use has been to predict effects on trade between EU countries and countries of Central and Eastern Europe during the period of these countries' accession to the EU (e.g. Hamilton and Winters, 1992; Papazoglou, Pentecost and Marques, 2006). For more than a decade, the gravity model has been primarily used to estimate the effects of Preferential Trade Agreements (PTAs) and the effects of liberalization on trade flows (e.g. Frankel and Rose, 2002; Baier and Bergstrand, 2007; Dragutinovic-Mitrovic and Bjelic, 2013).

There have been a few studies of the SEE region related to analyses of the effects of foreign trade liberalization on these countries' bilateral trade exchange as a consequence of the EU integration process. Braha et al. (2015) estimated a gravity model of trade for select EU candidate countries, and their analysis showed that exports are positively affected by product size (GDP) and to lesser extent by their trading partners' GDP. The results of their analysis also showed that exports decreased when distance increased, and the decrease in value of exports grew in direct accordance with the distance between trading partners. Trade liberalization had a positive impact on improving EU candidate countries' export performances.

Using panel data, Dragutinovic-Mirovic and Bjelic (2015) estimated a gravity model of bilateral export from SEE countries and the Central Eastern European countries to the core EU members for the period 2001 – 2010. The results in this paper indicate that the trade integration of these countries with the EU had a positive effect on their trade, especially in the first stage of EU integration. Trivic and Klimczak (2015) also analyzed the influence on bilateral trade among SEE countries for the period 1995 – 2012 using an augmented version of the gravity model, and their primary conclusion was that non-economic factors in the SEE region (direct communication and similarity of religious structures) play the most important roles in determining trade values between countries.

To the best of our knowledge, there are no studies in the literature that estimate the gravity model for the SEE agri-food sector as a whole. Some studies have analyzed the agri-food sector in some of the SEE countries. Dragutinovic--Mitrovic and Popovic-Petrovic (2013) analyzed the effects of trade liberalization on food exports in Serbia, and they estimated a gravity model both for Serbian food exports and food trade during the period 2004 – 2012. The results of this study indicated significant positive effects of ATMs and CEFTA on food exports and food trade, but the SAA had significant effects only on food imports. Also, Matkovski, Lovre and Zekic (2017) analyzed foreign trade liberalization for agri-food product exports from Serbia using a gravity model along with indices of comparative advantages and intra-industry trade. These authors concluded that market liberalization had positive effects on the intensification of Serbian foreign trade of agri-food products as well as on the increase of these products' comparative advantages in the international market.

Although the gravity model is good tool for analyzing liberalization effects, the model still has a few limitations. According to Gjems Theie (2015), one of these is that it analyzes trade at the aggregated level, so the assumption that each country produces only one good suppresses the fact that trade frictions affect different products differently. Another problem with the model is a possible reversed

causal relationship between GDP and trade flows. High income will lead to more trade, but more trade can lead to higher income. Because of this, it is important to consider these limitations when interpreting the results of estimated models.

The main question, which is in the focus of this study, is what effects the liberalization process has on trade of agri-food products in SEE countries. Another question is to what extent do the SAA and CEFTA have positive effects on exports and imports in the agri-food sector of SEE countries. Within this context, we have derived a general hypothesis from formulated gravity models:

- *Market liberalization has a positive effect on export and import flows of agri-food products in SEE countries.*

Furthermore, we have defined four sub-hypotheses:

- *Economic size has a positive effect on export and import flows of agri-food products in SEE countries.*
- *Geographical distance and a shared border have a negative effect on export and import flows of agri-food products in SEE countries.*
- *The SAA has a positive effect on export and import flows of agri-food products in SEE countries.*
- *CEFTA membership has a positive effect on export and import flows of agri-food products in SEE countries.*

2. Material and Methods

According to the Standard International Trade Classification (SITC) – Revision 4, the concept of agri-food products covers the following divisions and commodity groups: 00 – Live animals; 01 – Meat and meat preparations; 02 – Dairy products and birds' eggs; 03 – Fish (not marine mammals), crustaceans, mollusks and aquatic invertebrates, and preparations thereof; 04 – Cereals and cereal preparations; 05 – Vegetables and fruit; 06 – Sugars, sugar preparations and honey; 07 – Coffee, tea, cocoa, spices and manufactures thereof; 08 – Feeding stuff for animals (not including unmilled cereals); 09 – Miscellaneous edible products and preparations; 11 – Beverages; 12 – Tobacco and tobacco manufactures; 21 – Hides, skins and furskins, raw; 22 – Oil-seeds and oleaginous fruits; 261 – Silk; 263 – Cotton; 264 – Jute and other textile bast fibres, n.e.s., raw or processed but not spun; tow and waste of these fibres (including yarn waste and garnetted stock); 265 – Vegetable textile fibres (other than cotton and jute), raw or processed but not spun; waste of these fibres; 268 – Wool and other animal hair (including wool tops); 29 – Crude animal and vegetable materials, n.e.s; 41 – Animal oils and fats; 42 – Fixed vegetable fats and oils, crude, refined, or fractioned; 43 – Animal or vegetable fats and oils, processed.

The data sample includes foreign trade of agri-food products among 38 countries within the period 2005 – 2015 (in the case of Montenegro, only data from 2006 was used). This paper uses yearly, unbalanced panel data because SEE countries did not engage in foreign trade of agri-food products with some of the observed countries in the sample. Thus, the panel sample size varies among gravity models of the SEE countries, but it cannot exceed 418 yearly data observations.

This paper applies two gravity model specifications in order to examine the effects of foreign trade liberalization on the export and import of agri-food products in SEE countries. The model of the estimation of SEE countries' export/import of agri-food products is presented in the same way as Dragutinovic-Mitrovic and Popovic-Petrovic (2013):

$$\ln Y_{ijt} = \ln \alpha + \beta_1 \cdot \ln GDP_{jt} + \beta_2 \cdot \ln \frac{GDP_{jt}}{POP_{jt}} + \beta_3 \cdot \ln D_{ij} + \beta_4 \cdot B_{ij} + \\ + \beta_5 \cdot CEFTA_{ijt} + \beta_6 \cdot SAA_{ijt} + \mu_{ij} + \lambda_t + u_{ijt} \quad (1)$$

where equation (1) contains:

- Y_{ijt} as a dependent variable, is a value of agri-food products export/import from the SEE country *i* to country *j* in time *t*;
- GDP_{jt} is a gross domestic product of trade partner *j* in time *t*;
- GDP_{jt} / POP_{jt} is GDP per capita in country *j* – together with GDP these variables represent the factor of demand/supply ($\beta_1 + \beta_2$). We expect these two variables together to have positive effects on the trade of agri-food products and that signs for regressor GDP per capita would be negative. Regressor GDP per capita of an exporter country refers to the intensity of factors (the relationship between capital and labor); the greater the relationship is between capital and labor, the capitally richer the country is, and so the country produces more capital-intensive products than labor-intensive products. If a good is a luxury in consumption, that good is capital-intensive in production, the elasticity of the substitution of the good exceeds unity, and the theoretical coefficients for GDP per capita are all positively signed. Because of this, typical gravity equation coefficient estimates for these variables in aggregate trade flow regressions suggest that the products exchanged tend to be capital-intensive in production and luxuries in consumption (Bergstrand, 1989). At the sector level, values of coefficients of elasticity of regressor GDP per capita can show if a model is estimated for a capital-intensive or a labor-intensive sector, and it can also show if an importer's demand is focused on products for basic or luxury needs;

- D_{ij} is the distance between capital cities of countries *i* and *j* – trade is inversely proportional to the distance between two countries. Considering the nature of agri-food products, we expected this variable to have a high impact, and that distance has negative effects on the trade of agri-food products;
- B_{ij} is a dummy variable which includes the effects of a shared border on trade from country *i* to country *j* – we expected that a shared border would promote trade between countries (variable takes the value 1 if country *i* shares a border with country *j*, 0 if not);
- $CEFTA_{ijt}$ as a dummy variable that measures the effects of CEFTA integration on the trade of agri-food products from country *i* to country *j* (variable takes the value 1 if both countries are CEFTA members, 0 if not). We expected CEFTA to have positive effects on the trade of agri-food products;
- SAA_{ijt} is a dummy variable that includes the effects of the SAA on the trade of agri-food products from country *i* to country *j* (variable takes the value 1 for the period of SAA implementation, and 0 otherwise). We expected that CEFTA would have positive effects on the trade of agri-food products;
- μ_{ij} includes bilateral effects between country *i* and *j* but not in time *t*;
- λ_t involves effects of factors that vary over time, but not in country pairs;
- u_{ijt} is a stochastic variable of the gravity model.

Initial gravity models, presented by equation (1), are estimated in the form of fixed and random effects. A fixed effects model involves bilateral effects as fixed coefficients, while a random effects model uses those effects in a stochastic manner and as a part of stochastic error.

The selection of one of these models is based on testing the existence of a correlation between repressors and bilateral effects in a random effects model. Consequently, the testing procedure is conducted by applying a modified version of the Hausman test.

An empirical base for foreign trade was completed using the UN Comtrade Database (UN Comtrade, 2017) and using export and import values in USD, and data on GDP and GDP per capita (values in USD) were taken from the World Bank Database (World Bank, 2017). Data about distances in kilometers between main economic centers in the countries analyzed were taken from the website worldatlas.com (World Atlas, 2017). For the creation of dummy variables for the SAA and CEFTA, information from the European Commission (European Commission, 2017) and CEFTA Portal (CEFTA, 2017) were used respectively. The procedure for the estimation of the model was carried out using EViews 8 software.

3. Results and Discussion

3.1. Performances of Foreign Trade of the Agri-food Sector of the SEE Countries

The significance of the agri-food sector for the economies of SEE countries is also visible in terms of the value of the agri-food exports as part of the value of total exports. It is of particular importane in Serbia (20.9%), FYR Macedonia (15.4%), Montenegro (15.3%), and Croatia (12.0%) (Figure 1).

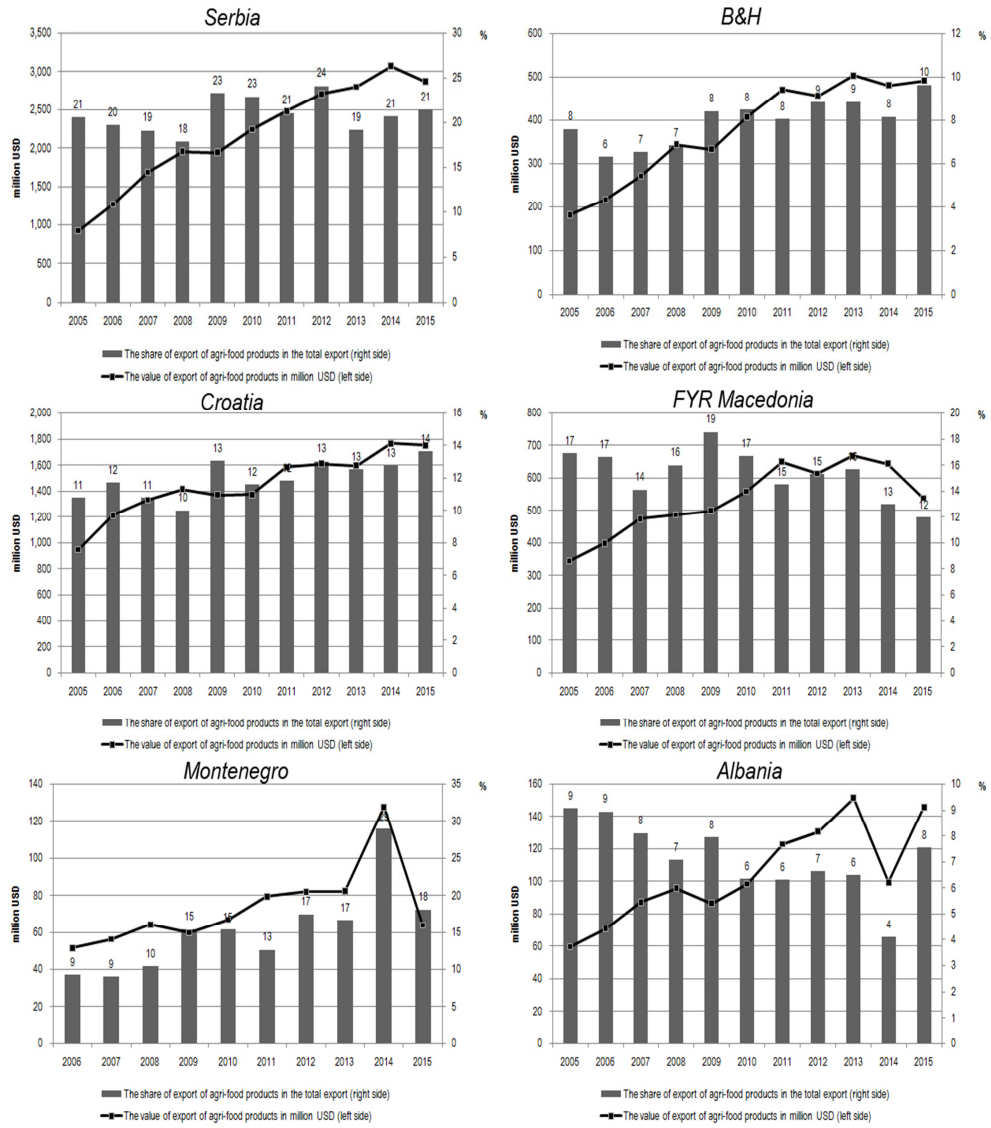
The dynamics of SEE countries' agri-food product exports is characterized by a continuous increase in the value of exports by an annual growth rate of about 7.6%. The highest growth in the value of agri-food product exports was achieved in Serbia, where export growth was around 11% annually. The growth of export in SEE countries was predominantly influenced by changing conditions and trade relations with their most important trading partners. As users of the EU's ATMs and CEFTA, the SEE countries have experienced significant benefits, which are reflected in an increase in the value of agri-food product exports. Even though the global economic crisis arose during the period analyzed here, it did not have a negative impact on agri-food product exports, primarily because these products play a specific role as a major source for fulling basic human needs. Due to this, products used as part of an everyday diet cannot be easily diminished even in a crisis period, so the role of this sector in international trade was not affected the same way others were (Stojanovic, Dragutinovic-Mitrovic and Popovic-Petrovic, 2013).

An analysis of SEE countries' export of agri-food products to selected trade partners in relative terms (Figure 2) shows that shares of export with these partners changed in accordance to the relevant trade regime. The regional structure of agri-food product exports indicates that the predominant portion of SEE countries' agri-food product exports was placed on the EU market: for the period 2005 – 2015 in Serbia it was 50.2% of export on average, B&H 61.0%, Croatia 46.1%, FYR Macedonia 50.2% and Albania 73.1%. In Montenegro, the EU market contributed only about 11.6% of agri-food product exports, while in the countries of CEFTA it was about 66.2% of agri-food product exports. In other countries that were analyzed, exports to the CEFTA region were also significant (Serbia 38.8% on average during this period, B&H 29.1%, Croatia 41.2%, FYR Macedonia 39.7%).

The share of exports to other SEE countries was smaller only for Albania, primarily due to large differences between Albania and the countries of the former Yugoslavia.

F i g u r e 1

Trends in the Export of Agri-food Products of the SEE Countries

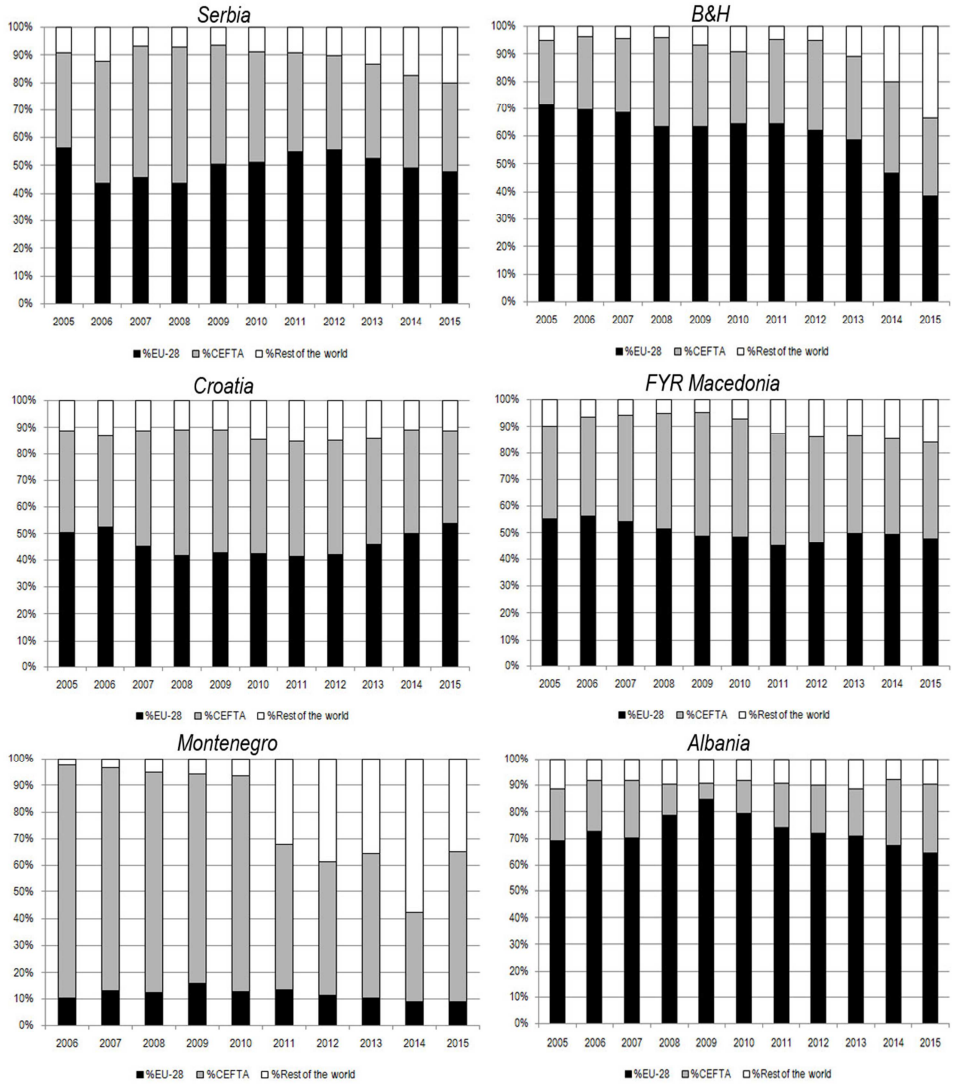


Source: The authors' calculations on the basis of UN Comtrade (2017).

Concerning imports (Figure 3), the structure of the value of total imports of agri-food products during this period was most important in Montenegro (22.3%), followed by B&H (18.1%), Albania (16.5%) and Macedonia (12.5%). Agri-food product imports continued to increase during this period, and the largest growth was also in Serbia (6.6% annually).

F i g u r e 2

Regional Structure of SEE Countries' Agri-food Product Exports



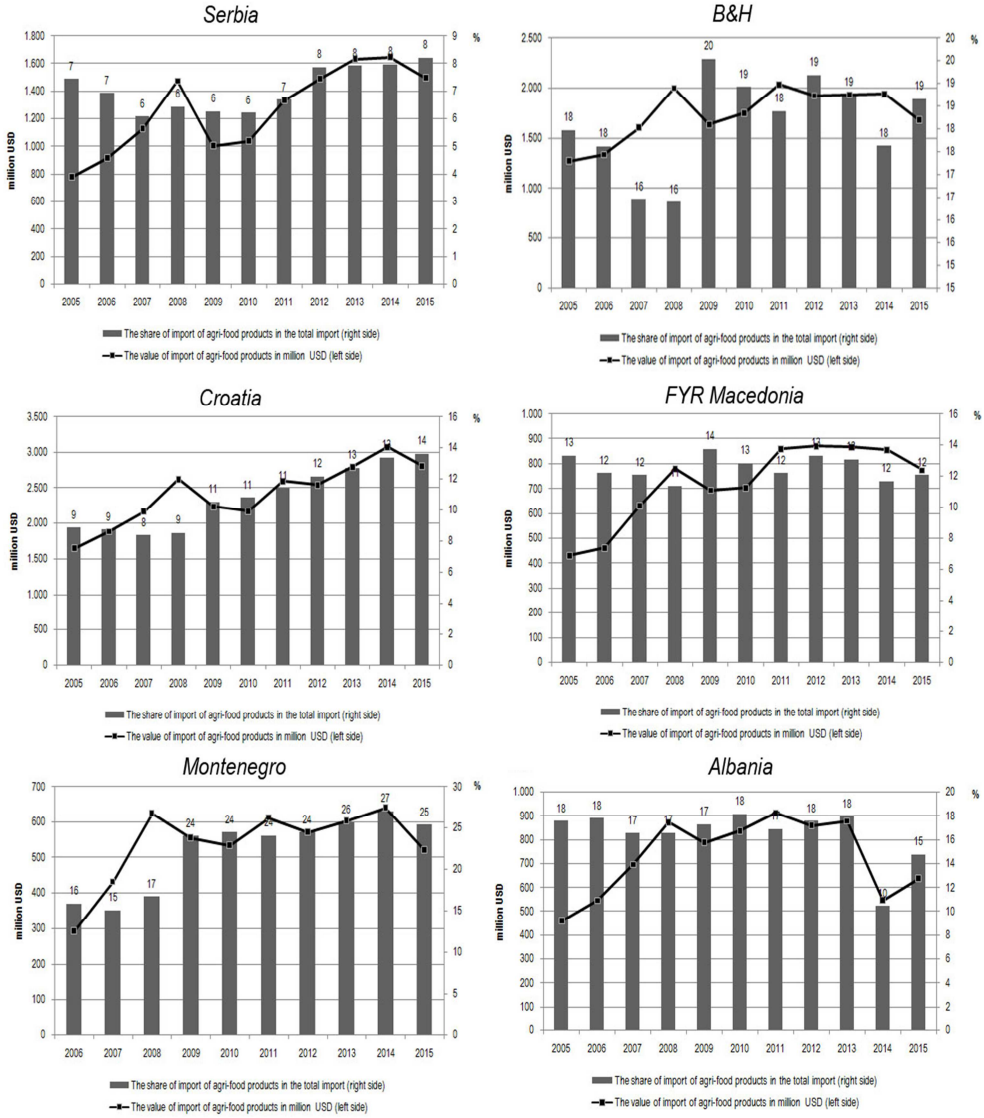
Source: The authors' calculations on the basis of UN Comtrade (2017).

In the regional structure of agri-food product imports (Figure 4), the dominant market for the import of these products in most SEE countries was that of the EU countries. In Croatia it was about 72.3%, B&H 58.3%, Albania 58.9%, Serbia 53.1%, FYR Macedonia 48.5%, and Montenegro 32.5%. Imports of agri--food products from other SEE countries had different importance among these countries: the biggest share of imports from SEE countries during this period was evidenced in Montenegro where 56.9% of total agri-food product imports

was from other SEE countries, while in Albania it was only 9.1%. Foreign trade between Albania and other SEE countries is low primarily because of differences in language and religion as well as historical events that have influenced trade. According to Trivic and Klimczak (2015), the ability to communicate directly and the similarity of religious structures were two auxiliary factors most likely to determine trade values.

F i g u r e 3

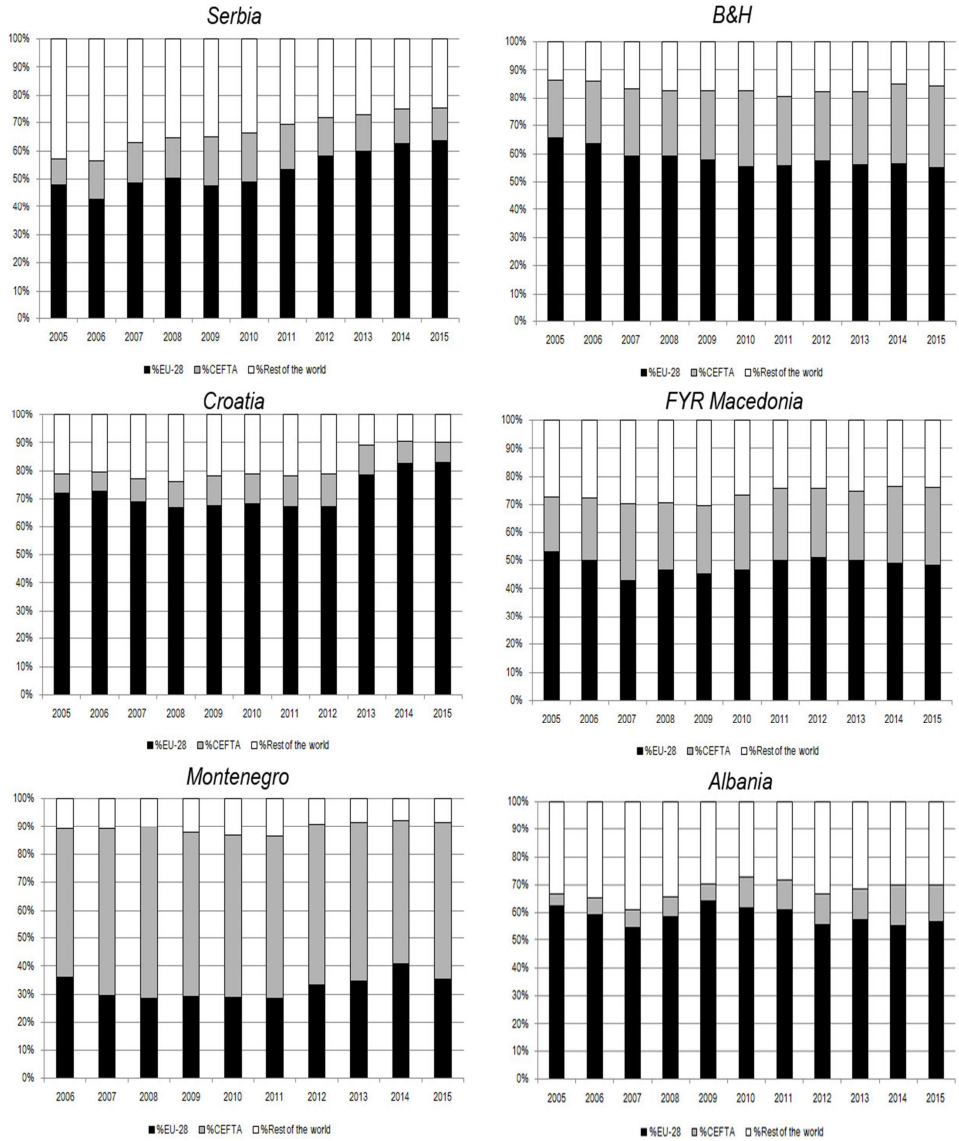
Trends in Agri-food Product Imports of SEE Countries



Source: The authors' calculations on the basis of UN Comtrade (2017).

F i g u r e 4

Regional Structure of SEE Countries' Agri-food Product Imports

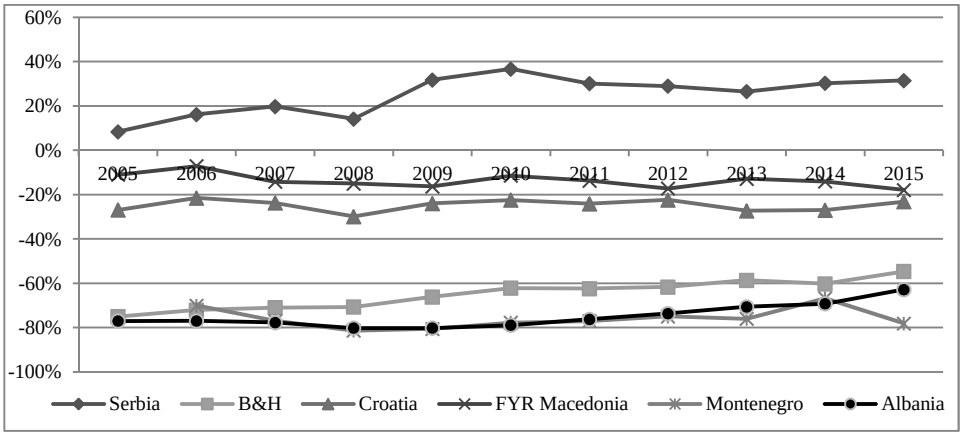


Source: The authors' calculations on the basis of UN Comtrade (2017).

The relative trade balance of SEE countries' agri-food products during this period affirms the fact that all of these countries, with the exception of Serbia, dealt with a trade deficit in the foreign trade of agri-food products (Figure 5). The larger negative relative trade balance of agri-food products was evident in the smaller and less productive economies (Montenegro, Albania, B&H).

F i g u r e 5

The Relative Trade Balance of Agri-food Products of the SEE Countries



Source: The authors' calculations on the basis of UN Comtrade (2017).

3.2. Estimation of the Gravity Model of SEE Countries' Export and Import of Agri-food Products

A different estimation model is needed for the panel data set. In this paper, the standard panel two-stage least squares method shows the best fit. The following step assumes which effect suits better across individual and/or time in the panel data set. A selection process between fixed and random effects model specification in the case of the gravity model is based on testing potential significant correlation coefficients between regressors and bilateral effects (stochastic parts of the model). The null hypothesis assumes that the preferred model is one with random effects versus the alternative hypothesis of using a fixed effects model. According to the results of Hausman tests in Tables 2 and 3, the null hypothesis is accepted in each model. In other words, it is better to apply a random effects model to the observed panel data sample. Furthermore, an application of random effects model specification enables the involvement of important individual variables such as some of the dummy variables fixed in time, which cannot be included in a fixed effects model specification without some appropriate modifications in estimation procedure. The problem of first order autocorrelation was detected in the gravity model of export for FYR Macedonia. Therefore, the potential inefficient parameter estimation in the presence of autocorrelation unraveled with the two-stage least square (TSLS AR(1)) model specification.

According to the 1% significance level and number of parameters K = 7 or 8, the critical values for the Durbin-Watson test are: dL = 1.7499 and dU = 1.7979. When compared with the estimated test results in Table 2, the Durbin-Watson test shows no significant serial correlation of residuals in all six gravity models

of export because dU<DW<4-dU. Additionally, six set estimated gravity models of export in Table 2 perform the White test of heteroscedasticity with asymptotic Chi-square distribution. In all cases, the results (asymptotic Chi-square probability < 0.05) accept the hypothesis that residuals are homoscedastic or have the same finite variance.

T a b l e 2

Estimation of the Gravity Model of Export of SEE Countries' Agri-food Products

	Serbia	**B&H**	**Croatia**	**Macedonia**	**Montenegro**	**Albania**
Regressor	RE model	RE model	RE model	TSLS AR(1)	RE model	RE model
Constant	3.5737	4.8202*	7.3290*	15.317**	6.4440*	7.0333*
GDP_{jt}	0.8746***	1.4770***	0.9509***	0.6719***	0.4250**	1.1319***
GDP_{jt}/POP_{jt}	0.2801*	–0.2761	–0.7234**	–0.5887*	0.0609	–0.0357
D_{ij}	–1.8889***	–3.8884***	–1.4022**	–1.5466***	–0.9226*	–3.3477***
B_{ij}	2.6217***	1.8608*	2.7185***	0.7058	3.3799**	0.9328
CEFTA	0.0137	0.9058***	1.1206***	0.4658	0.4897*	0.3800*
SAA	0.4415***	0.2253*	–0.1221	–0.2355	–0.0773	0.8463***
AR(1)	–	–	–	0.7888***	–	–
Panel data	415	339	410	278	274	298
R-squared	0.5935	0.4232	0.4928	0.8879	0.4085	0.4273
Adjusted R-squared	0.5876	0.4127	0.4853	0.8854	0.3952	0.4155
S.E. of regression	0.7136	1.2045	0.9313	0.7212	1.1053	1.1760
F-statistic	28.0798***	16.681***	10.838***	309.824***	4.997***	17.675***
Durbin-Watson stat	1.8768	1.8644	1.8753	1.8874	2.0147	1.8678
White test	69.9536 (0.0326)	68.1025 (0.0451)	71.2254 (0.0259)	72.6981 (0.0196)	67.7254 (0.0481)	69.1154 (0.0378)
Hausman test	6.8148 (0.1460)	5.2122 (0.2662)	4.1858 (0.3814)	7.3117 (0.1203)	6.9601 (0.1380)	7.3846 (0.1169)

Note: *, ** and *** level of significance 10%, 5% and 1%, respectively.

Source: The authors' calculations.

In the estimated gravity model of export (Table 2), the influence of factor of demand, which is approximated by coefficients of elasticity of GDP and GDP per capita of the importer, is significantly positive: a 1% increase in demand for agri-food products, if other factors are same, led to an average 0.71% increase in the value of agri-food product exports in SEE countries. The influence of demand on the increase in the value of agri-food product exports was present in B&H (1.20%), Serbia (1.15%) and Albania (1.10%), while in Macedonia an increase in demand by 1% led to an increase in the value of exports of these products by only 0.08%. In all SEE countries, the influence of distances between main economic centers was significant and negative for this period, while a shared border had a significant and positive influence in the majority of SEE countries, with the exception of FYR Macedonia and Albania. A shared border was not significant in Albania and Macedonia primarily because of poor relationships with neighboring countries, which is a consequence of historical circumstances.

Regional integration of SEE countries established by CEFTA had different influences among these countries. In some SEE countries, CEFTA had a significant influence on the increase in exports of the agri-food products in countries which are members of CEFTA. CEFTA made the biggest contribution to the agri-food product exports in Croatia, where exports of this sector to other countries that are members of this agreement increased on average by 206.67% [$(e^{1.1206}-1)\cdot 100 = 206.67\%$]. CEFTA also made a significant contribution to the agri-food product exports in B&H, Montenegro, and Albania, where this agreement contributed on average 147.39% [$(e^{0.9058}-1)\cdot 100 = 147.39\%$], 63.18% [$(e^{0.4897}-1)\cdot 100 = 63.18\%$] and 46.23% [$(e^{0.3800}-1)\cdot 100 = 46.23\%$], respectively.

The results of the gravity model of agri-food product exports showed that the SAA made a significant contribution to the increase in agri-food product exports to EU countries only in Albania, Serbia and B&H, while in other SEE countries the effects of this agreement were not significant. This result was expected because the SAA primarily liberalized import, while export has been liberalized since the ATMs. The SAA had an influence on the increase of agri-food product exports in Albania by an average of 133.10% [$(e^{0.8463}-1)\cdot 100 = 133.10\%$], in Serbia 55.50% [$(e^{0.4415}-1)\cdot 100 = 55.50\%$], and in B&H 25.27% [$(e^{0.2253}-1)\cdot 100 = 22.27\%$].

T a b l e 3

Estimation of the Gravity Model of for SEE Countries' Imports of Agri-food Products

	Serbia	**B&H**	**Croatia**	**Macedonia**	**Montenegro**	**Albania**
Regressor	RE model	RE model	RE model	TSLS AR(1)	RE model	RE model
Constant	4.4534	7.7167*	4.2732	11.4667***	5.0669	2.5865
GDP_{jt}	1.0951***	1.3565***	1.1122***	0.8773***	1.2488***	1.3474***
GDP_{jt}/POP_{jt}	–0.2978*	–0.5505**	–0.4291*	–0.3736	–0.1224	–1.1542***
D_{ij}	–2.0574***	–3.1506***	–1.8306***	–2.1054***	–3.1757***	–1.5824***
B_{ij}	1.0868*	1.5039	1.2832*	0.7183	0.6917	1.0775
CEFTA	0.4436**	0.1765	0.6166***	–0.0684	0.5157*	0.7711***
SAA	0.6041***	0.2093*	–0.0757	0.2295	0.0537	0.0742
AR(1)	–	–	–	0.8389***	–	–
Panel data	402	397	408	352	372	359
R-squared	0.5163	0.6285	0.5737	0.9163	0.5326	0.5838
Adjusted R-squared	0.2471	0.2046	0.1626	0.9146	0.1597	0.2011
S.E. of regression	0.8437	0.8363	0.7434	0.6772	1.0509	1.0459
F-statistic	22.9402***	17.9806***	14.1693***	538.1499***	12.7521***	16.0173***
Durbin-Watson stat	1.9016	1.8411	1.9091	2.0624	1.8381	1.9229
White test	71.7254 (0.0236)	72.3341 (0.0211)	77.2205 (0.0080)	70.3719 (0.0303)	69.1214 (0.0378)	70.6189 (0.0290)
Hausman test	7.0144 (0.1351)	5.6744 (0.2248)	8.1804 (0.0852)	4.0216 (0.4031)	8.6299 (0.0710)	8.1455 (0.0864)

Note: *, ** and *** level of significance 10%, 5% and 1%, respectively.

Source: The authors' calculations.

The critical values for the Durbin-Watson test are the same as in the gravity model of exports. In comparison with the estimated test results in Table 3, the Durbin-Watson test shows no significant serial correlation of residuals in all six gravity models of imports because dU<DW<4-dU. Also, the six estimated gravity models of imports in Table 3 implement the White test of heteroscedasticity with asymptotic Chi-square distribution. The result in each estimated model shows the acceptance of the hypothesis that residuals are homoscedastic or have the same finite variance (asymptotic Chi-square probability < 0.0001).

The results of the estimation of the gravity model showed that the model of import supply had a positive and significant contribution to the value of the agri--food product imports in all SEE countries. The factor of supply was approximated by regressors GDP and GDP per capita of the exporter country. An increase of economic activity in the exporter country had the biggest influence on the increase of the value of agri-food product imports in Montenegro, where a 1% increase of economic activity in exporter countries increased the value of agri-food product imports by 1.12%. In other SEE countries, a 1% increase in the economic activity of an exporter country also meant an increase in the value of agri-food product imports as follows: B&H 0.81%, Serbia 0.80%, Croatia 0.68%, FYR Macedonia 0.50% and Albania 0.19%. Relatively low values of coefficients of elasticity in the estimated model as well as negative values of coefficients of regressor GDP per capita were expected because agri-food products are labor-intensive products, and these products are used meet basic needs.

Distance as significant barrier for trade had a significant and negative effect on agri-food product imports, meaning that a larger distance between an SEE country and a trade partner led to lower foreign trade. Only in Serbia and Croatia shared borders had a positive and significant influence on the dynamics of agri--food product imports.

The effect of CEFTA on imports in SEE countries in the gravity model of imports was positive and significant in the majority of SEE countries. As in the first model, CEFTA had the biggest influence on agri-food product imports in Albania, where the agri-food product imports had an average increase of 116.21% [$(e^{0.7711}-1)\cdot 100 = 116.21\%$]. CEFTA also had a significant influence on agri-food product imports in other SEE countries: in Croatia CEFTA increased import of these products by an average of 85.26% [$(e^{0.6166}-1)\cdot 100 = 85.26\%$], in Montenegro by 67.48% [$(e^{0.5157}-1)\cdot 100 = 67.48\%$] and in Serbia by 55.83% [$(e^{0.4436}-1)\cdot 100 = 55.83\%$]. In comparison with the first model (gravity model of exports), in the gravity model of imports, CEFTA made bigger contribution to trade in Serbia, Montenegro, and Albania. In other SEE countries, CEFTA contributed more to exports of agri-food products than imports, while in FYR Macedonia, CEFTA did not have a significant contribution to trade flows of agri-food products.

As for the SAA, out of all the SEE countries, it had a positive and significant influence on agri-food product imports only in Serbia and B&H. The SAA contributed to an increase in agri-food product imports from EU countries: Serbia had an average increase of 82.96% [$(e^{0.6041}-1)\cdot 100 = 82.96\%$] and B&H had an average increase of 23.28% [$(e^{0.2093}-1)\cdot 100 = 23{,}28\%$].

The results in this paper are in line with the results found by Dragutinovic-Mitrovic and Bjelic (2015), who also concluded that the SAA did not have a strong impact on SEE countries˙ bilateral export, and that the SAA introduced symmetry to the trade regime, but no significant impact occurred. They also found that CEFTA made a significant contribution to intra-regional trade among SEE countries, primarily because these countries are natural trade partners with convergent economies at the same level of competitiveness. On the other hand, previous research for period 1999 – 2007 showed that previous liberalization did not improve trade in the SEE region, which may be a result of recent conflicts between these countries (Begovic, 2011). Other studies that analyzed the effects of liberalization on the trade of agri-food products in Serbia also indicated significant positive effects of EU integration and CEFTA integration on the trade of these products (Dragutinovic-Mitrovic and Popovic-Petrovic, 2013; Matkovski, Lovre and Zekic, 2017).

Conclusion

During the last fifteen years, SEE countries have started integration processes with the EU as well as those of mutual political and economic rapprochement. This led to the creation of the CEFTA Agreement and the signing of the SAA with the EU. In these countries, agriculture plays a relatively significant role in the both economy and in foreign trade flows. Because of this, it is interesting to analyze how the liberalization process influences the agricultural sector. In the period analyzed here, a permanent increase of the value of the agri-food product exports was present, but only Serbia had a positive net-export in this sector. In FYR Macedonia and Croatia, there was a small deficit in the agri-food sector, while in B&H, Albania, and Montenegro, the foreign trade deficit in this sector was more pronounced. Trade of agri-food products has been with EU and the CEFTA countries, and trade with EU countries has been most pronounced in Albania and Croatia in in terms of imports, while trade with CEFTA countries has been slightly more pronounced in trade flows in Montenegro.

The results of the estimated gravity model in this paper showed that exports of agri-food products increased under the influence of demand, which had a significant impact in B&H, Serbia, and Albania. Also, the proximity of export destinations contributed to the increase in exports, while a shared border had no significance

only in the cases of Albania and FYR Macedonia. The establishment of CEFTA had the biggest influence on the increase of agri-food product exports in Croatia, B&H, and to a lesser extent in Albania and Montenegro. However, the SAA had a significant impact on the increase of agri-food product exports in Albania, Serbia, and B&H. According to the gravity model of imports, CEFTA had a positive and significant influence on the increase of agri-food product imports in the majority of SEE countries. The biggest influence of this agreement was present in Albania, while the influence of SAA on foreign trade of agri-food products was significant only in Serbia and B&H. Smaller distances also had a positive impact on agri-food product imports in all SEE countries, while a shared border had a significant influence only in Serbia and Croatia.

The scientific contribution of this is reflected in the successful testing of the research hypotheses. The econometric model in this paper was formulated to test all set hypotheses. The results obtained in this study explicitly confirm the general hypothesis, and the sub-hypotheses were mostly confirmed, primarily due to the lack of a statistically significant contribution of some variables on export/ import gravity model. In this context, the results of this study represent a contribution to understanding the complex issues of trade liberalization in agri-food products in SEE countries.

In order to improve foreign trade positions, SEE countries must take certain steps to increase the competitiveness of the agri-food sector. A short-term policy should focus on productive incentives that would primarily encourage livestock production, as well as create preconditions for achieving standards in this sector. In the plant production sector, support should focus on building storage capacities. A long-term policy must go toward the creation of a better market, and therefore an economic position for agricultural producers in these countries. In this context, strengthening institutional capacities in terms of better organization of smaller agricultural producers would be crucial for this process. The manufacturing sector is also one of the main directions for export performance growth, so the future agricultural policy should also take it into account. Therefore, analyses of the agri-food sector's level of competitiveness in SEE countries will be a subject of interest in future studies.

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