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Original Paper

Trade of agri-food products in the EU enlargement process: Evidence from the Southeastern Europe

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Abstract: Since the last decade, significant changes have occurred in the trade flows of agri-food products of the Southeastern European countries (SEE) due to adjustment to international market. Namely, as all countries of the SEE strive to be full members of the EU; market opportunities have been changing, primarily because of the reduced barriers on trade with the EU, as well as with the regional countries. In order to investigate the effects of the liberalization process of the agri-food sector of the SEE countries on their export, as well as the total foreign trade, a gravity model based on panel data in the period 2005–2015 has been estimated. According to the results, liberalization of the market in the SEE countries, as a consequence of the EU enlargement process, as well as regional integrations, had positive effects on the total foreign trade of agri-food products. Despite the positive liberalization effects on the agri-food trade, all SEE countries have a lower level of competitiveness than the EU countries, so an organized access to products which possess comparative advantages will be an important condition for the achievement of their particular positions at the international market.

Keywords: agri-food products, Central European Free Trade Agreement (CEFTA), EU, gravity model, Southeastern European countries (SEE)

The beginning of the last decade of the 20th century in the Southeastern European countries (SEE)[1] was marked by political and economic changes, which resulted in the transformation from the centrally planned socialist economy to market oriented economy. The integration of the SEE countries into the global market brings major challenges for their market of agri-food products. The actors along the food chain are faced with new market opportunities, but also with weaknesses of adopting new standards and roles. Producers of agri-food products are forced to accelerate the technical and technological innovations, as well as the innovations in management in order to be competitive in the global market. At this moment, the SEE countries are in different stadiums of the integration to the European Union (EU).

The EU granted the asymmetrical trade concession to the SEE countries primarily because of their low level of competitiveness in the global market.

The Autonomous Trade Measures (ATM) are asymmetrical trade preferences in favour of the SEE countries and these measures enabled the tariff free and quota free export from the SEE to the EU, except for sugar, throat, baby-beef and wine. In most SEE countries, the ATMs have been established in 2000, except in Serbia and Montenegro, where the application of this regime started in 2003. The Stabilization and Association Agreement (SAA) established the free trade zone between the SEE countries and the EU, so the SAA introduced the reciprocity in trade with the EU. The SAA has influenced import from the EU to the SEE countries, but slowly, since the period of transition was usually 8 years (Erjavec 2008). In some countries (Serbia and B&H), before the SAA entered into force, the application of the Interim Agreement on trade and trade related issues started and it is crucial for the trade regime implementation. The development of cooperation among the SEE countries

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[1]Southeastern Europe (SEE) is geographical and political region located primarily on the Balkan Peninsula. The countries included can vary greatly due to the political economy consideration of the observer and in this paper Serbia, Bosnia and Herzegovina (B&H), Croatia, Former Yugoslav Republic of Macedonia (FYR Macedonia), Montenegro and Albania are included. This SEE subregion is also named Western Balkan (Eberlin et al. 2014).

Table 1. Important dates in the trade regime of the Southeastern European countries (SEE)

	ATMs	SAA signed	SAA entry into force	CEFTA entry into force
Serbia	2003	29/04/2008*	01/02/2010	24/10/2007
B&H	2000	16/06/2008*	01/07/2008	22/11/2007
Croatia	2000	29/10/2001	01/02/2005	22/08/2007
FYR Macedonia	2000	09/04/2001	01/04/2004	26/07/2007
Montenegro	2003	15/10/2007	01/05/2010	26/07/2007
Albania	2000	12/06/2006	01/04/2009	26/07/2007

*Serbia and Bosnia and Herzegovina (B&H) – the dates are for the Interim Agreement on trade and trade related issues; ATM – Autonomous Trade Measures; CEFTA – Central European Free Trade Agreement; FYR Macedonia – Former Yugoslav Republic of Macedonia; SAA – Stabilization and Association Agreement

Source: Dragutinović-Mitrović and Bjelić (2013)

was an important requirement for the preparation for the membership in the EU. Countries of the SEE region signed a new Central European Free Trade Agreement in 2006 (CEFTA). This agreement removed barriers on trade, so it liberalized the intra-regional trade of the SEE countries.

The transition from the central planning to a market economy, trade liberalization, free trade agreements, regional/European integration and rapid adjustments to the EU membership might have induced substantial changes in the structure of the agri-food trade flows and changes in the comparative advantages of the SEE countries (Bojnec and Ferto 2009). However, the main problems of the export of agri-food products of the SEE are the domination of products represented by raw materials and the low value added (processed) products (Volk et al. 2012), with a lack of export specialization for higher-values processed consumer-ready food (Bojnec and Ferto 2010). Also, the problems of export are a low quality, quantity and fluctuation, as well as the price competitiveness. Thus, reaching the EU standards and requirements concerning product quality will be a large problem. The main factor of lower levels of the agri-food competitiveness in the SEE to the EU is, in addition to other factors, a low level of productivity, primarily the labour productivity (Zekić et al. 2010).

In this paper, the liberalization effects on the agri-food sector in the SEE are in the focus of the research. Those effects involve the effects of the achieved trade agreements with the EU and the CEFTA countries on the export and the bilateral trade of agri-food products, primarily the change of intensity, trends and structure of foreign trade exchange. One of the ways of determining liberalization effects is the estimation of gravity model, so in this paper, two gravity models are estimated: the gravity model of export and the

gravity model of the total foreign trade. The main objective of this paper is analysing to which extent the SAA and the CEFTA have effects on the export and the total foreign trade of agri-food products in the SEE.

In the SEE countries, there are few researches, which analyse effects of the Preferential Trade Agreements (PTA) and regional integrations on the total foreign trade. Dragutinović-Mitrović and Bjelić (2015), using the panel data, estimated the gravity model of total foreign trade from the SEE countries to the core EU members in the period 2001–2010. The importance of trade between the SEE countries was highlighted by the authors Toševska-Tripčevska and Tevdovski (2014) in their paper, which measured the effects of certain customs and administrative procedures on the trade between the SEE countries in period 2008–2012. The authors Bjelić et al. (2013) analysed the effects of non-tariff measures in the intraregional trade of the SEE, as well as in the export of the SEE region to the EU in period 2006–2011, and concluded that technical barriers to trade significantly reduced the SEE trade with the EU and noticed that administrative barriers were also an important factor that affected the SEE trade.

Braha et al. (2015) analysed the effects of integrations on the trade in the SEE countries as the selected EU candidate countries and concluded that liberalization had a positive impact on the export performances of the EU candidate countries. Additionally, Trivić and Klimczak (2015) analysed the determinants of the intra-regional trade in the SEE using the gravity model in the period 1995–2012 and found that the strongest influences on the trade values were exhibited by the variables representing the ease of a direct communication and the similarity of religious structures. Also, Klimczak (2014) analysed

the international trade in the SEE using the gravity model in the period 1995–2007 and concluded that the communicational, cultural and historical factors have had a statistically important influence on the value of trade. There are few papers that deal with the problem of trade liberalization using the gravity model for one country of the SEE. Bjelić and Dragutinović-Mitrović (2012) analysed the effects of competing trade regimes on the bilateral trade flows in the case of Serbia in period 2001–2010 and the main conclusion of their research was that in Serbia, distance played a more prominent role in the total foreign trade than the degree of liberalization of the trade regimes. Nastić (2013) analysed export of Bosnia and Herzegovina using the gravity model in the period 2002–2011 and concluded that a greater influence on the export of this country was that of CEFTA than the integration with the EU.

The regional trade integration has more influence on the trade of agri-food products than other products (Grant and Lambert 2008). In this context, the authors Dragutinović-Mitrović and Popović-Petrović (2013), and Matkovski et al. (2017) analysed the effects of the foreign trade liberalization on the export of agri-food products of Serbia and found positive correlation between the liberalization and trade intensification, especially an increase of the food export from Serbia.

MATERIAL AND METHODS

The effects of the liberalization of trade of agri-food products in the SEE in the EU enlargement process are determined using the gravity model for panel data. The gravity model has been used since the second half of the twentieth century in different forms. In last period model is often used for determination of the effects of PTAs on the total foreign trade. From the basic form of the gravity model (Tinbergen 1962), a numerous specifications of the model are derived, but in this paper, a linear form of the models like in the paper Dragutinović-Mitrović and Popović-Petrović (2013) is used. The first model is the gravity model of export of agri-food products in the SEE countries:

$$\ln X_{ijt} = \ln \alpha + \beta_1 \ln Y_{jt} + \beta_2 \ln (Y_{jt}/L_{jt}) + \beta_3 \ln D_{ij} +$$

$$+ \beta_4 B_{ij} + \beta_5 \text{CEFTA}_{ijt} + \beta_6 \text{SAA}_{ijt} + \mu_{ij} + \lambda_i + u_{ijt} \quad (1)$$

where is: X_{ijt} – a dependent variable which represents the value of export of agri-food products of

the exporter country i in the country j in period t; Y_{jt} – an independent variable which represents GDP of the importing country j in period t; Y_{jt}/L_{jt} – an independent variable which represents GDP per capita of the importing country j in period t; D_{ij} – an independent variable which represents a distance between the countries i and j; B_{ij} – a dummy variable which examines the effects of the mutual border on the export of agri-food products of Serbia. Since the mutual border, as a rule, implies a greater foreign trade exchange of the countries, a variable has the value 1 for the countries, which have the mutual border with the SEE countries, and the value 0 for other countries; CEFTA_{ijt} – a dummy variable, which covers the effects of the CEFTA on the export of agri-food products of the SEE countries. The variable has the value 1 for the member states during the implementation of the agreement, and the value 0 for other countries; SAA_{ijt} – a dummy variable which covers the effects of the SAA on the export of agri-food products of the SEE countries. The variable has the value 1 during the implementation of the agreement for the EU countries, and the value 0 for other countries; μ_{ij} – individual effects in the panel model which cover the specifics of trade between country i and j, but not in time t; λ_t – temporal effects in the panel model, covering impacts of the factors which vary through time, but not by pairs of countries; u_{ijt} – represents a stochastic variable of the model.

A positive influence of demand on export of agri-food products (approximated by the sum of coefficients β_1 and β_2) is expected. A negative value of the estimated coefficients of variable GDP per capita is expected as well, which means that in export from countries of the SEE, the products for the basic human needs dominate.

The second model is a model of the total foreign trade of agri-food products of the SEE:

$$\ln X^*_{ijt} = \ln \gamma + \delta_1 \ln Y_{it} + \delta_2 \ln (Y_{it}/L_{it}) + \delta_3 \ln Y_{jt} +$$

$$+ \delta_4 \ln (Y_{jt}/L_{jt}) + \delta_5 \ln D_{ij} + \delta_6 B_{ij} + \delta_7 \text{CEFTA}_{ijt} +$$

$$+ \delta_8 \text{SAA}_{ijt} + \mu_{ij} + \lambda_i + u_{ijt} \quad (2)$$

In this model, the dependent variable X^*_{ijt} includes the total foreign trade of agri-food products in both directions, e.g. both import and export of agri-food products are considered. The SAA and the CEFTA influence import side, so the estimation of this model can show the effects of these agreements on the

import of agri-food products. In this model, two other variables are included: Y_{it} – an independent variable, which represents GDP of the exporting country, i in period t; Y_{it}/L_{it} – an independent variable, which represents GDP per capita of the exporting country, i in period t.

According to the Standard International Trade Classification (SITC) – Revision 4 (United Nations 2006), the concept of agri-food products covers the following divisions and commodity groups: 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 11, 12, 21, 22, 261, 263, 264, 265, 268, 29, 41, 42, 43.

A gravity model of the export of agri-food products in the SEE (Equation 1) covers 2 091 observations of the panel, while second model – a gravity model of the total foreign trade of agri-food products (Equation 2) covers 4 426 observations of the panel. A foreign trade between countries of the SEE and main foreign trade partners is observed in the both analysed models. The main partners of the SEE countries in the trade of agri-food products on the international markets are the countries of the EU, but the intra-trade between the countries of the SEE is also very significant and it is regulated by the CEFTA. Except the EU and the CEFTA countries, Turkey, Russia, Switzerland, Kazakhstan and Belorussia are also included in the estimation of models. The research covers the 2005–2015 period of time and unbalanced panel data is used, due to the fact that in some years, there was no trade between some countries of the SEE and their foreign trade partners. The estimation procedure, as well as testing, is done in the software *Gretl 1.10.0.* For the necessary empirical basic of this research, several international databases are used. The data for the foreign trade are taken from the UN Comtrade Database (2016), while data for GDP and GDP per capita are taken from the World Bank Database (The World Bank 2016). For the data about the distances of main economic centres, the data is taken from the World Atlas database World Atlas (2016), and other dummy variables are created using the information from the EU and the CEFTA portals (CEFTA Portal 2017).

RESULTS AND DISCUSSION

Foreign trade of agri-food products in the SEE

According to the data of the UN Comtrade (2016), agri-food products are a significant part of the total export
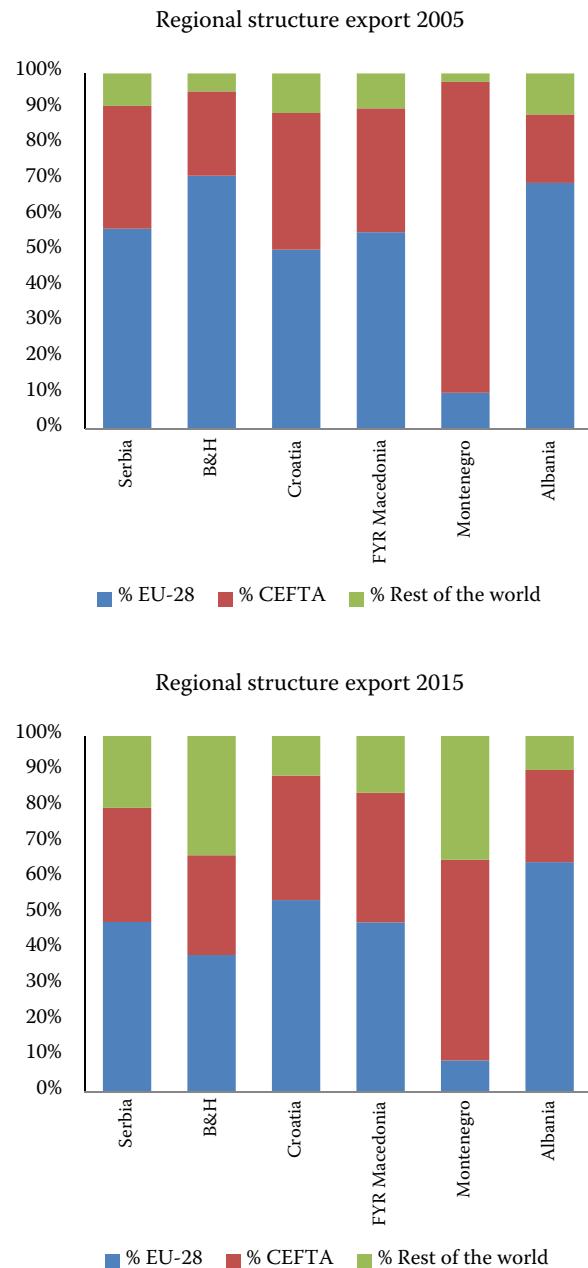

Figure 1. Regional structure of export of agri-food products of the Southeastern European countries (SEE)
*Montenegro – the data is for 2006; CEFTA – Central European Free Trade Agreement

Source: The authors' calculations on the basis of the UN Comtrade (2016)

in all SEE countries, especially in Serbia, where in the period 2005–2015, the agri-food products contributed to the total export by 21%, in average. In the same period, the significance of agri-food products in the total export in FYR Macedonia was 15%, in Croatia 12%, in Montenegro 10%, in B&H 8% and in

Albania 7%. On the other hand, the biggest share of the agri-food import in the total import among the SEE countries was present in Montenegro (22%, in the average of the analysed period 2006–2015). The import of agri-food products was also a significant part of the total import in B&H, where it contributed 18% in the total import, and in Albania 17%. A slightly lower proportion is present in FYR Macedonia, Croatia and Serbia, 13%, 11% and 7%, respectively.

The main trade partner of all SEE countries is the EU, except in the case of Montenegro, where the CEFTA countries are the main partner in the foreign trade. The trade with the EU countries had a dominant share in the structure of export in almost all economies of the SEE (Figure 1). Analysing the regional structure of export of the SEE countries in 2005 and 2015, it can be stated that the shares of exports with the analysed partners varied in accordance to the relevant trade regimes. The share of export of agri-food products from the EU decreased from 2005 to 2015 in the majority of the SEE countries, while this share of export from rest of the world increased. The EU was the most important export market for agri-food products from Albania (73.1% of agri-food products was exported to the EU, in average for the period 2005–2015), while the CEFTA was the most important export market for agri-food products for Montenegro (66.2% of agri-food products was exported to the CEFTA countries, in average for the period 2006–2015).

The regional structure of the import of agri-food products was similar to the export structure. The EU was the dominant market for import of agri-food products in the most SEE countries (Figure 2). The CEFTA was not a very significant import market, except in Montenegro. The EU was the most significant import market in Croatia (in average 72.3% of agri-food products was imported from the EU countries, for the period 2005–2015), while on the other hand, in Montenegro only 32.5% of agri-food products was imported from the EU (in average for the period 2006–2015). In Montenegro, the majority of agri-food products was imported from the CEFTA countries (in average 56.9% of agri-food products was imported from the CEFTA countries, for the period 2006–2015), while the CEFTA market participated in import of agri-food products in Albania and Croatia by only 9.1% (in average for the period 2005–2015). The trade among Albania and other SEE countries was on a low level, primarily because of the historical circumstances and a great gap in culture, language,
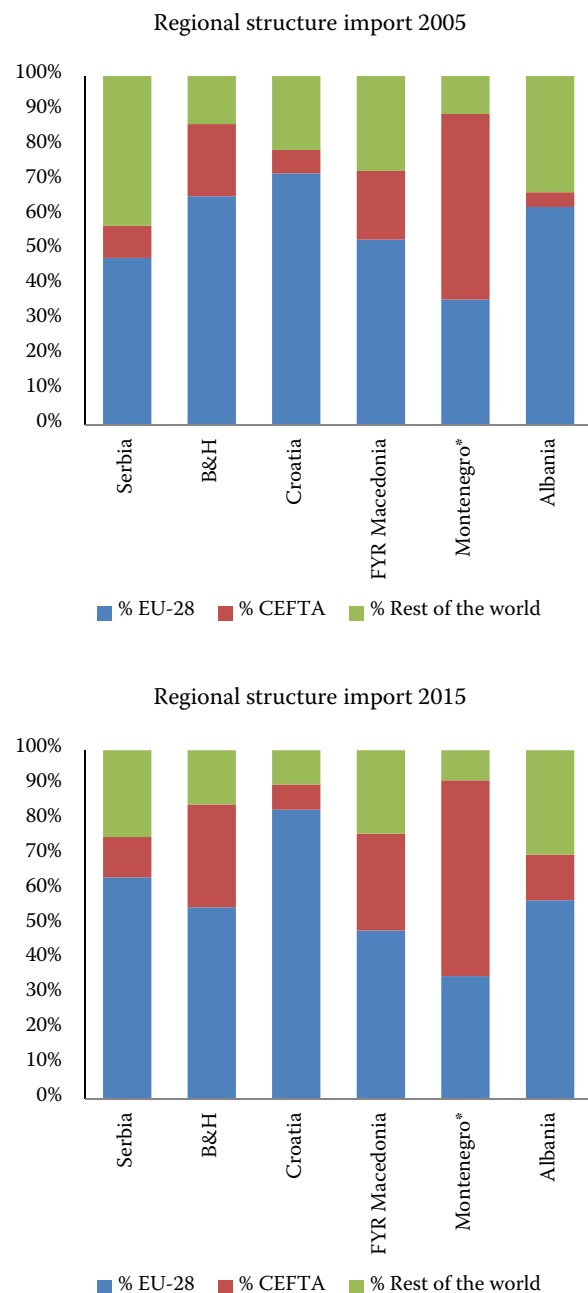
Figure 2. Regional structure of import of agri-food products of the Southeastern European countries (SEE)

*Montenegro – data is for 2006; CEFTA – Central European Free Trade Agreement

Source: The authors' calculations on the basis of UN Comtrade (2016)

religion and other factors. The ability of citizens to communicate in the same language as well as the similarity of religion are very important factors that determine the trade value in a great measure (Trivić and Klimczak 2015).

Table 2. Net-export of agri-food products of Southeastern European countries (SEE) in million USD

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Serbia	export	923	1 267	1 686	1 956	1 945	2 244	2 480	2 707	2 804	3 072	2 870
	import	779	914	1 129	1 472	1 006	1 040	1 331	1 490	1 630	1 646	1 496
	net-export	143	353	557	484	938	1 204	1 149	1 217	1 174	1 427	1 374
B&H	export	181	217	272	344	333	408	471	456	504	481	492
	import	1 268	1 332	1 601	1 999	1 634	1 746	2 033	1 922	1 932	1 938	1 679
	net-export	–1 087	–1 116	–1 329	–1 656	–1 301	–1 339	–1 562	–1 466	–1 428	–1 457	–1 187
Croatia	export	949	1 215	1 334	1 415	1 372	1 373	1 585	1 612	1 596	1 766	1 751
	import	1 648	1 880	2 165	2 621	2 236	2 169	2 592	2 541	2 791	3 071	2 806
	net-export	–699	–665	–832	–1 206	–864	–796	–1 007	–929	–1 195	–1 305	–1 055
FYR Macedonia	export	345	399	474	487	499	559	651	614	668	644	539
	import	430	460	631	779	693	704	857	870	865	855	773
	net-export	–85	–61	–157	–293	–194	–145	–207	–255	–197	–211	–235
Montenegro	export	–	52	56	64	60	67	79	82	82	128	64
	import	–	292	432	625	556	534	612	572	603	640	521
	net-export	–	–241	–376	–561	–496	–467	–533	–490	–521	–513	–457
Albania	export	60	71	87	96	87	99	123	131	151	99	146
	import	460	545	696	871	788	836	912	859	878	547	638
	net-export	–400	–474	–609	–776	–701	–738	–789	–728	–727	–448	–492

B&H – Bosnia and Herzegovina; FYR Macedonia – Former Yugoslav Republic of Macedonia

Source: The authors' calculations on the basis of the UN Comtrade (2016)

As far as the net-export of agri-food products of the SEE countries is concerned (Table 2), a positive net-export with a permanent increase of the surplus in foreign trade of agri-food products was present only in Serbia. We can conclude that smaller and less productive countries, such as B&H, Montenegro and Albania, coped with a deeper trade deficit of agri-food products.

Estimation of Gravity Model of agri-food products in the SEE

The first step in both models is the estimation of the gravity model of random-effects (RE). The results of the *Breusch-Pagan test*, which is used to see if simple pooled model (OLS) or RE is adequate, showed that the RE is preferred. The *Hausman test* is often used in order to choose between the fixed-effects (FE) and RE, e.g. the *Hausman test* tests whether there is a significant difference between the fixed and random effects estimators. As the *Hausman test* is significant, the FE model is preferred. The estimation of the FE model is often suggested in literature for the estimation of the gravity model of trade, but in this model, it is not possible to estimate the effects of time-invariant regressors such as distance and border. Also, in both estimated gravity models using the FE, Durbin-Watson test (DW) showed autocorrelation of the first order, because the value of DW test is less than lower the critical value (Table 3).

In order to remove the problem of the inefficient estimation in the models of RE and FE, the gravity models of agri-food products of the SEE countries are estimated using the Weighted Least Squares method (WLS). In this method, the residuals, which have the higher absolute value, get the less weight and *vice versa*. Two models in Table 4 perform the *White test* of heteroscedasticity with the asymptotic Chi-square distribution. In both cases, the results (asymptotic chi-square probability < 0.0001) accept the hypothesis that residuals are homoscedastic or have the same finite variance. Also, the *Durbin-Watson test* shows no significant serial correlation of residuals in both models because dU < DW < 4-dU (dU – upper critical value of DW test).

In the estimated gravity model of the export of agri-food products in the SEE countries using the

Agric. Econ. – Czech, 64, 2018 (8): 357–366

Original Paper

Table 3. Estimation of the gravity model of the agri-food products in the model of random-effects and fixed-effects of the Southeastern European countries (SEE)

Model of the export of agri-food products

Regressor	random-effects (RE)		fixed-effects (FE)	
	coefficient	*p*-value	coefficient	*p*-value
Const	4.9548	0.0930*	−25.0887	0.0884*
Y_{jt}	0.9239	< 0.0001***	1.4901	0.1046
Y_{jt}/L_{jt}	0.1567	0.3629	0.0778	0.9337
D_{ij}	−2.3850	< 0.0001***	–	–
B_{ij}	2.6590	< 0.0001***	–	–
CEFTA$_{ijt}$	0.4552	0.0001***	0.2406	0.0540*
SAA$_{ijt}$	0.3782	< 0.0001***	0.3472	< 0.0001***
Hausman test	33.78 (0.0000)		*R*-squared	0.90
Breusch-Pagan test	5 345.80 (0.0000)		Durbin-Watson test	1.40
Observations	2 091			2 091

Model of the total foreign trade of agri-food products

Regressor	random-effects (RE)		fixed-effects (FE)	
	coefficient	*p*-value	coefficient	*p*-value
Const	−13.3875	< 0.0001***	87.7400	< 0.0001***
Y_{jt}	0.8433	< 0.0001***	−0.4737	0.5371
Y_{jt}/L_{jt}	−0.4004	0.0011***	1.4168	0.0664*
Y_{it}	1.2484	< 0.0001***	−5.0964	< 0.0001***
Y_{it}/L_{it}	−0.4327	0.0004***	5.5725	< 0.0001***
D_{ij}	−2.2945	< 0.0001***	–	–
B_{ij}	1.5169	< 0.0001***	–	–
CEFTA$_{ijt}$	0.3983	< 0.0001***	0.2467	0.0032***
SAA$_{ijt}$	0.2115	< 0.0001***	0.1862	< 0.0001***
Hausman test	104.41 (0.0000)		*R*-squared	0.91
Breusch-Pagan test	9 548.25 (0.0000)		Durbin-Watson test	1.231
Observations	4 426			4 426

*,** and*** level of significance 10%, 5% and 1%, respectively; B_{ij} – a dummy variable which examines the effects of the mutual border on the export of agri-food products of Serbia; CEFTA – Central European Free Trade Agreement; CEFTA$_{ijt}$ – effects of the CEFTA on the export of agri-food products of the SEE countries; D_{ij} – distance between the countries *i* and *j*; Y_{it} – GDP of the exporting country, i in period t; Y_{it}/L_{it} – GDP per capita of the exporting country, *i* in period *t*; Y_{jt} – GDP of the importing country *j* in period *t*; Y_{jt}/L_{jt} – GDP per capita of the importing country *j* in period *t*; SAA – Stabilization and Association Agreement; SAA$_{ijt}$ – a dummy variable which covers the effects of the SAA on the export of agri-food products of the SEE countries

Source: The authors' calculations

WLS method (Table 4), we can see that demand had a positive and significant influence on the increase of the export of agri-food products. Demand is approximated by the coefficients of elasticity of GDP (Y_{jt})

and GDP per capita (Y_{jt}/L_{jt}) of the importer and the results of estimated model showed that 1% increase of demand for agri-food products, if other factors are same, led to the increase of export of agri-food products in the SEE countries by 0.24% in average. The distance between the exporter and the foreign trade partner had a significant and negative influence on export of agri-food products, while mutual country border had a significant and positive influence on the export flows of the agri-food products in the SEE. As far as the free trade agreements are concerned, the results of the estimated gravity model of export of agri food products in the SEE showed that the CEFTA, as well as the SAA, had a significant and positive impact on the export of agri-food products of the SEE countries. The CEFTA contributed to the increase of the export of agri-food products of the SEE countries in average by

123.71% [(e$^{0.805188}$ − 1) × 100 = 123.71%].

The results showed that the SAA also had a positive and significant influence on the increase of the export of agri-food products of the SEE countries, but in some lesser extent than the CEFTA. The SAA contributed to the increase of the export of agri-food products in average by

50.78% [(e$^{0.410665}$ − 1) × 100 = 50.78%].

In the model of the total foreign trade of agri-food products of the SEE countries, which is also estimated using the WLS method, a complete analysis of foreign trade has been done, so the import of agri-food products, as well as export, is considered. The SAA primarily liberalized import from EU countries, so the estimation of this model can better determine the effects of the foreign trade liberalization with the EU than in the estimation of the model of export. The CEFTA is also important in the import of agri-food products, as it led to the free trade on both sides - export and import. In this model, an increase of demand had a positive and significant influence on the increase of the total foreign trade of these products. If other factors are the same, an increase of demand, which is approximated by the regressors GDP and GDP per capita of the importer country, led to the increase of the total trade of agri-products (an increase of demand for 1% led to the increase of the total trade of agri-food products by 0.17%). An increase of the economic activity, which is approximated by the regressors GDP and GDP per capita of the exporter country, is the factor of supply. In the

Original Paper

Agric. Econ. – Czech, 64, 2018 (8): 357–366

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Table 4. Estimation of the gravity model of agri-food products in the model of Weighted Least Squares of the Southeastern European countries (SEE)

Model of the export of agri-food products

Regressor	Weighted Least Squares (WLS)			
	coeff.	std. error	*t*-ratio	*p*-value
Const	10.4237	0.5142	20.2721	< 0.0001***
Y_{jt}	0.7538	0.0191	39.3752	< 0.0001***
Y_{jt}/L_{jt}	−0.5118	0.0375	−13.6530	< 0.0001***
D_{ij}	−1.5503	0.0541	−28.6703	< 0.0001***
B_{ij}	2.0211	0.0901	22.4403	< 0.0001***
$CEFTA_{ijt}$	0.8052	0.0912	8.8265	< 0.0001***
SAA_{ijt}	0.4107	0.0558	7.3627	< 0.0001***
R-squared	0.76			
Adjusted *R*-squared	0.76			
F-test (6, 2084)	1 100.95			
P-value (F)	0.0000			
White test	678.44 (0.0000)			
DW test	2.03			
Observations	2 091			

Model of the total foreign trade of agri-food products

Regressor	Weighted Least Squares (WLS)			
	coeff.	std. error	*t*-ratio	*p*-value
Const	−9.6265	0.3766	−25.5628	< 0.0001***
Y_{jt}	0.7840	0.0120	65.0457	< 0.0001***
Y_{jt}/L_{jt}	−0.6175	0.0232	−26.6207	< 0.0001***
Y_{it}	1.2111	0.0101	119.8695	< 0.0001***
Y_{it}/L_{it}	−0.6616	0.0205	−32.2236	< 0.0001***
D_{ij}	−1.8834	0.0239	−78.7108	< 0.0001***
B_{ij}	1.1617	0.0319	36.4248	< 0.0001***
$CEFTA_{ijt}$	0.8295	0.0522	15.9014	< 0.0001***
SAA_{ijt}	0.3888	0.0251	15.4571	< 0.0001***
R-squared	0.87			
Adjusted *R*-squared	0.87			
F-test (8, 4417)	3 849.56			
P-value (F)	0.0000			
White test	1 234.15 (0.0000)			
Durbin-Watson test	2.05			
Observations	4 426			

*,**,*** level of significance 10%, 5%, 1%, respectively; B_{ij} – a dummy variable which examines the effects of the mutual border on the export of agri-food products of Serbia; CEFTA – Central European Free Trade Agreement; $CEFTA_{ijt}$ – effects of CEFTA on the export of agri-food products of the SEE countries; D_{ij} – distance between the countries *i* and *j*; Y_{it} – GDP of the exporting country, *i* in period *t*; Y_{it}/L_{it} – GDP per capita of the exporting country, *i* in period *t*; Y_{jt} – GDP of the importing country *j* in period *t*; Y_{jt}/L_{jt} – GDP per capita of the importing country *j* in period *t*; SAA – Stabilization and Association Agreement; SAA_{ijt} – a dummy variable which covers the effects of the SAA on the export of agri-food products of the SEE countries

Source: The authors' calculations

estimated gravity model of the total foreign trade of agri-food products of the SEE countries, the factor of supply had a significant and positive impact on the total foreign trade of agri-food products. The distance between the main economic centres, i.e. the SEE countries and their trade partners, had a significant and negative influence on the trade flows of agri-food products, which means that larger distance led to lower foreign flows of agri-food products. A mutual country border in this model had a significant and positive influence on the trade of agri-food products. The effect of the CEFTA on the total foreign trade of agri-food products in the SEE was positive and significant. Namely, the CEFTA had influenced the increase of the total foreign trade of agri-food products in countries of the SEE averagely for

129.23% $[(e^{0.829542} − 1) × 100 = 129.23\%]$.

The SAA with the EU also significantly and positively influenced the total foreign trade of agri-food products of the SEE countries. This Agreement led to the increase of the total foreign trade in these countries for 47.52% in average

$[(e^{0.388776} − 1) × 100 = 47.52\%]$.

The fact that the CEFTA influenced an increase of the total foreign trade of agri-food products in the SEE to a greater extent than the SAA is in line with result in the paper Nastić (2013) and Dragutinović-Mitrović and Popović-Petrović (2013).

CONCLUSION

In the last two decades, significant changes occurred in the SEE countries, primarily as a consequence of the foreign integrations. Namely, all SEE countries noted as strategic objectives the membership in the EU, so all these countries are in different stadiums of adjustments to the roles of the EU, except Croatia, which is a full member since 2013. Foreign trade is liberalized through the SAA, which influenced the changes in the foreign trade flows. Also, the SEE countries liberalized the intra trade through the CEFTA. In that context, this paper investigated the effects of the achieved liberalization on the export, as well as the total foreign trade of agri-food products.

The results of the estimated gravity model of the export of agri-food products showed that the SAA and the CEFTA had an impact on the increase of the export of agri-food products. The agreement

with other SEE countries (CEFTA) contributed to the increase the export of agri-food products of the SEE countries in average by 123.71%, while the SAA influenced the increase of the export of agri-food products in average by 50.78%. The second gravity model, the gravity model of the total foreign trade, showed similar results as the first gravity model. Namely, according the second estimated model, the CEFTA contributed to the increase of the total foreign trade of agri-food products of the SEE in average by 129.23%, while the SAA led to the average increase by 47.52%. Also, in both models the distance, as well as the mutual country border, had a statistically significant influence on the trade flows of agri-food products: the mutual border had a positive influence on the trade flows, while the distance had a negative influence on the trade flows.

Although the results of both gravity models showed a positive impact on the foreign trade flows of the agri-food products, production, as well as the foreign trade performances are noticeably worse in the SEE than in the EU countries. Also, some previous researches showed that the EU enlargement has a negative impact on the agri-food relative trade advantages. So, in focus of our future researches, there will be analysing of the level of comparative advantages of the agri-food products in the international market.

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