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HOW CEFTA INFLUENCED COMPETITIVENESS OF AGRI-FOOD TRADE IN WESTERN BALKANS[1]

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Abstract: The regional integration with the CEFTA significantly influenced the liberalization of market, which influenced the increase of export of agri-food products in Western Balkan economies. The main objective of this paper is to examine the impact of the CEFTA on the export of agri-food products of Western Balkan economies on the global and regional market. In that context, comparative advantages have been analysed, and the gravity model based on panel data has been estimated. According to the results, all the Western Balkan economies have comparative advantages in export on the international market. Results of estimation of the gravity model showed that free trade agreements with the EU and CEFTA had positive effects on the intensification of the export of agri-food products. Western Balkan economies have similar level of economic development and competitiveness, so reintegrating the market established by CEFTA affected the export of agri-food products more than agreement with EU.

Keywords: CEFTA, Agri-food trade, Western Balkan, Revealed Comparative Advantages, Gravity Model.

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1. Introduction

The Central European Free Trade Agreement (CEFTA) was initially a free trade agreement between Central European economies. The agreement was signed on December 2, 1992, in Krakow between Poland, Hungary, and Czechoslovakia. As Kupich (1999) noted intensification of cooperation within the CEFTA was intended to prepare the Central and Eastern European economies for European Union (EU) integration. Therefore, CEFTA should not be understood as an end in itself, but rather as a means to the strategic goal of European integration. In the meantime, Slovenia, Romania, Bulgaria, and Croatia joined the agreement and left it by joining the EU. Today, all members of the CEFTA agreement are Southeast European economies, i.e. the economies of the Western Balkans and Moldova (Table 1).

Table 1. *Members of the CEFTA*

CEFTA members	Year of accession	Former CEFTA members	Year of accession	Year of withdrawal
North Macedonia	2006	Hungary	1992	2004
Serbia	2007	Czech Republic	1992	2004
Bosnia and Herzegovina	2007	Slovakia	1992	2004
Albania	2007	Poland	1992	2004
Moldova	2007	Slovenia	1996	2004
Montenegro	2007	Romania	1997	2007
		Bulgaria	1999	2007
		Croatia	2003	2013

Source: Birovljev et al., 2017

The CEFTA is crucial for the economies of the Western Balkans for several reasons. The first reason is economic. As Kikerkova (2009) noted, this agreement has had a significant effect on trade growth between the Western Balkan economies in just two years. Furthermore, the CEFTA is essential for strengthening cooperation among CEFTA parties that have often conflicted in the relatively recent past. Also, this agreement is important from the perspective of European integration. By strong regional cooperation, the CEFTA can play an indirect role in elimination of political disagreements between these economies. As Petreski (2013) emphasized, strengthening cooperation, reducing non-tariff barriers, the mutual attraction of foreign investments, harmonization of laws on public procurement, and other joint activities can bring significant benefits to Western Balkan economies and accelerate the European integration process and increase global market presence. Recently, an Action Plan for a Common Regional Market has been created in order to be implemented by the end of 2024 (CEFTA, 2021). This agenda proposes four key areas:

- Regional trade area: free movement of goods, services, capital and people, including crosscutting measures, such as the Green Lanes, to align with EU-

compliant rules and standards and provide opportunities for companies and inhabitants;
- Regional investment area, to align investment policies with the EU standards and best international practices and promote the region to foreign investors;
- Regional digital area, to integrate the Western Balkans into the pan-European digital market;
- Regional industrial and innovation area, to transform the industrial sectors, shape value chains they belong to, and prepare them for the realities of today and challenges of tomorrow.

Geographical proximity, as well as cultural similarity, generally affect deeper connections. The Western Balkan economies have specific characteristics that give them good preconditions for regional cooperation (The World Bank, 2008):

- Most Western Balkan economies were part of the former Yugoslavia single market, so significant benefits can be gained from reintegration, for example of supply chains;
- The Western Balkan economies are generally small, so many benefits can be realized through participation in a larger regional market;
- Numerous geographical and ethnic factors lead to the growth of interdependence of these economies: language similarity, common ethnic minorities, geographical specificity of Croatia that surrounds Bosnia and Herzegovina;
- All Western Balkan economies strive for EU integration, which means they have the same long-term regulatory framework.

The main goal of this paper is to determine the impact of the CEFTA on agri-food trade competitiveness of Western Balkan economies. This impact will be examined through comparative advantages analysis and estimation of the gravity model. Based on this goal, general hypothesis is created:

- *CEFTA significantly improved export flows of agri-food products in Western Balkans.*

Additionally, two sub-hypotheses are developed:

- *CEFTA significantly influenced comparative advantages of export of agri-food products in Western Balkans;*
- *CEFTA has a positive effect on export flows of agri-food products in Western Balkans.*

The paper is divided into several chapters. After the introduction, a detailed review of the literature was presented. Then, the basic methods of this research are explained, as well as the databases used. Next, the research results are divided into three parts: global competitiveness, trade and comparative advantages, and estimation of gravity model. Discussion and conclusion are the last two chapters of this paper.

2. Literature review

Analysis of competitiveness is very complex because it can be done from different approaches, and this is confirmed by the numerous definitions of competitiveness (because there is no universal definition), defined levels and forms of competitiveness, with different ways of measurements and expressions. This is one of the main disadvantages in competitiveness analysis; the problem of defining the meaning of the term and many varieties of competitiveness determinants in space and time (Siudek and Zawojska, 2014). The main division of competitiveness in literature is defined as micro and macro level on company or country level, but some authors are including term of meso competitiveness to describe regional competitiveness or position of some part of industry that is revealing competitiveness of an economy (Jambor and Babu, 2016). It is more common to look on the competitiveness of economies from new perspectives that are going beyond traditional ways of observing goals as Gross Domestic Product (GDP) or position of current accounts of economies to analyse position of an economy in international comparison (Aiginiger et al., 2013). New approaches to measuring competitiveness are becoming more usual because of compound position of economies on the world market of developed globalization (Önsel et al., 2008). Competitiveness is often connected with term of comparative advantages, although these two terms should not be mistakenly equalized because they have some differences (Frohberg and Hartmann, 1997). One of the indicators that is used in analysing competitiveness of agri-food trade is index of Revealed Comparative Advantages (RCA) on global market, that can be used for revealing strong and weak points of development of agri-food sector in different economies. According to Bojnec and Fertő (2018) duration of comparative advantages of economies can also be measured by RCA index within regions with trade agreements or trade unions. Other used indexes in literature are net trade index, index of current competitiveness, productivity, Grubel-Lloyd index, the global index of competitiveness and many others. Balassa (1965) index of RCA has been used in literature to determine export competitiveness of the agri-food sector of individual economies or on the regional level. RCA index was used in some researches of export competitiveness on Western Balkan market or CEFTA (Miteva-Kacarski, 2018; Marjanović, 2019) and researches of export competitiveness of agri-food products of individual economies (Cvetković and Petrović-Ranđelović, 2017) or whole region of Western Balkan (Matkovski et al., 2016). Research of authors Matkovski et al. (2016) showed that all economies of Western Balkan region have comparative advantages in export of agri-food products, except Albania. In literature, there are also more alternative indexes of comparative advantages, that are used in recent studies (Yu et al., 2009). Also, index can show comparative advantages of some sectors of an economy in comparison to other economies while those sectors could have negligible impact on domestic economy (Hinloopen and Marrewijk, 2001).

For describing effects of foreign trade liberalization and integration through application of free trade agreements, a gravity model is often used in literature. The model was initially derived from Newton`s law of gravity, and it was introduced in research about the international economy in 1962 (Tinbergen, 1962). Equation of gravity model was then defined as empirically complete, although some indications of gravity model of international trade can be found even in works of Adam Smith in 18th century (1776)

through his research about bilateral volume of trade according to the size of an economy and distance between economies. Those were considered as elements and reasons for the growing wealth of nations with its overflow in foreign economies through international trade (Elmslie, 2018). With the equation of gravity model, it is estimated that trade between two economies is proportional to the GDP of economies and inversely proportionate with their territorial distance, as main factors of a model. More frequent usage of this model, considered as an empirical success although with firstly emphasized theoretical deficiency (Bergstrand, 1985), brought new variables other than GDP and distance in research about international trade between economies. Considered variables are political, institutional, geographical, but also historical, communicational and cultural. These factors can either improve or limit trade while creating or reducing trade barriers between economies (DeRosa, 2008; Trivić and Klimczak, 2015), and these factors are of particular interest when specific attributes of Western Balkan and its trade are considered. Wider range of possible usage of the model resulted in its application in trade analysis of inter and intra trade between regions, with special utilization in questioning effects of free trade through preferential bilateral agreements (Nguyen, 2019) and custom unions (Urata and Okabe, 2010) that have impacted development of regionalism (Martinez-Zarzoso, 2003). Effects of free trade agreements can also be noticed in agri-food trade on a regional level (Grant and Lambert, 2005).

Using the gravity model, some examples in previous literature deal with estimation of effects of CEFTA on the trade of agri-food products in Western Balkans on a level of one economy or for the whole region. So far research for Serbia has shown that trade liberalization and CEFTA had positive results in agri-food or trade of agricultural products, but that there is certainly a place for further improvement of economies position because the spread of positive results was unevenly distributed. Results from research of estimation gravity model for period 2004-2012, showed that market was characterized with improved position of Serbian agri-food trade and export growth in all economies where Serbia signed free trade agreements (Dragutinović-Mitrović and Popović-Petrović, 2013). Other than this, it was discovered that CEFTA had greatest impact in intra-regional trade of Western Balkan economies for the same period of observation because of the barrier's reduction. Comparing with most EU economies Western Balkan economies were in inferior position because of the still present barriers in trade with EU core and their much greater competitiveness (Dragutinović-Mitrović and Bjelić, 2015). According to research of authors Matkovski et al. (2018a), results had shown that in 2005-2015 period there had been deficit of agri-food trade in all the Western Balkan economies, except for Serbia, while results of estimation of gravity model showed that CEFTA impacted unevenly on individual export of economies of this region. Main trade partner of the Western Balkan economies was EU, although intensified trade of agri-food was present inside of CEFTA region with similar tendencies in both export and import (Matkovski et al., 2018b). Also, authors Uberti and Demukaj (2019) analysed regional integration, trade, and development in the Balkans using a dynamic Poisson estimator in panel data. These authors indicated that the ability of CEFTA in taking advantage of trade liberalization depends on the supply-side

environment and concluded that proactive policies for export promotion and industrial upgrading are fundamental.

To the best of our knowledge, there are no recent studies in literature dealing with problematic effects of trade of agri-food products in Western Balkans that simultaneously evaluate the effects of CEFTA using gravity model and comparative advantages, so this research with its **originality** will contribute to filling this gap.

3. Material and methods

In line with the main scope of this research to evaluate changes of the export competitiveness of agri-food product in Western Balkans influenced by CEFTA, an index of revealed comparative advantages and estimation of gravity model are used. First, comparative advantages are calculated using the traditional RCA index, which is developed by author Balassa (1965) often used in determining comparative advantages in the agri-food sector (Mizik, 2021):

$$\mathrm{RCA_{ij}} = \frac{\frac{\mathrm{X_{ij}}}{\mathrm{X_{it}}}}{\frac{\mathrm{X_{nj}}}{\mathrm{X_{nt}}}}$$

where is: X– export; i – country; j – sector; t – total export; n – group of exporting economies. When RCA is greater than 1, there are comparative advantages of the analysed sector. RCA greater than 3 means strong, RCA between 2 and 3 means significant, while values of RCA between 1 and 2 represent the satisfactory level of comparative advantages.

Estimation of the effects of trade liberalization induced by CEFTA is done using the gravity model with panel data. Since Tinbergen (1962) a number of specifications of this model were derived, and this paper uses a linear form of the model like in the paper Dragutinović-Mitrović and Popović-Petrović (2013) and Matkovski et al. (2018b):

$$\ln \mathrm{X_{ijt}} = \ln \alpha + \beta_1 \ln \mathrm{Y_{jt}} + \beta_2 \ln (\mathrm{Y_{jt}}/\mathrm{L_{jt}}) + \beta_3 \ln \mathrm{D_{ij}} + \beta_4 \mathrm{B_{ij}} + \beta_5 \mathrm{CEFTA_{ijt}} + \beta_6 \mathrm{SAA_{ijt}} + \mu_{ij} + \lambda_i + \mathrm{u_{ijt}}$$

where is:

- $\mathrm{X_{ijt}}$– a dependent variable that represents the export value of agri-food products of exported economy i to the economy j in period t;
- $\mathrm{Y_{jt}}$ – an independent variable that represents GDP of the importer economy j in period t, while $(\mathrm{Y_{jt}}/\mathrm{L_{jt}})$ is an independent variable that represents the GDP of the importer economy j in period t. These two independent variables together represent a factor of demand of importer economy j, and it is expected that these two variables have positive effects on the export of agri-food products;
- $\mathrm{D_{ij}}$ – an independent variable that represents a distance between the main economic centres of economies i and j. It is expected that this variable has negative effects on the export of agri-food products;

- B_{ij} – a dummy variable that examines effects of the shared border of economies i and j. Since shared border, as a rule, increases trade exchange, this variable has the value 1 for the economies that have shared border with the Western Balkan economy and the value 0 for other economies. It is expected that this variable has positive effects on the export of agri-food products;
- $CEFTA_{ijt}$ – a dummy variable that examines the effects of CEFTA on the trade of agri-food products between economies i and j. This variable has value 1 if both economies are CEFTA members in time t. It is expected that this variable has positive effects on the export of agri-food products;
- SAA_{ijt} – a dummy variable that examines the effects of Stabilisation and Association Agreement (SAA) on the trade of agri-food products between economies i and j. This variable has value 1 for economy i that signed SAA in time t. It is expected that this variable has positive effects on the export of agri-food products;
- μ_{ij} – individual effects in the panel model which cover specific of bilateral trade between economies i and j;
- λ_i – temporal effects in the panel model that vary over time, but not in county pairs;
- u_{ijt}– a stochastic variable of the model.

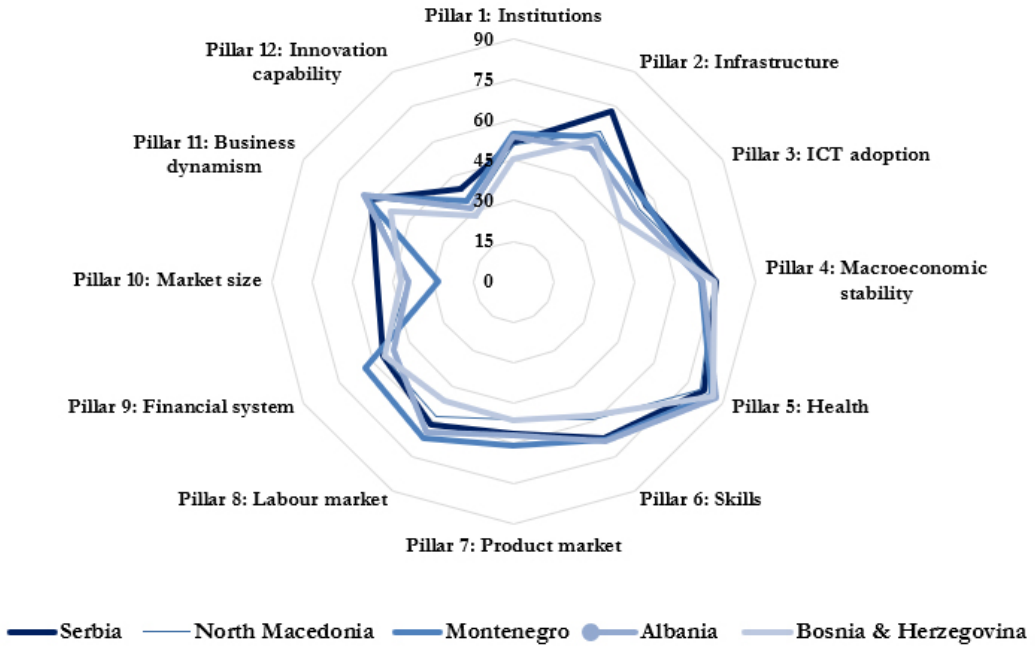
The data sample includes export from five Western Balkan economies (Serbia, Bosnia and Herzegovina, North Macedonia, Montenegro and Albania) to 38 most significant trade partners (economies of EU, CEFTA, Turkey, Russian Federation, Switzerland, Kazakhstan and Belarus) in period 2005-2020, so the estimated model covers 2,501 observations of the panel data (unbalanced panel data). The procedure of the model estimation was carried out using Gretl 1.10.0 software, while an empirical base was completed using: UN Comtrade Database (2021) for values of export, the World Bank (2021) for values of GDP and GDP per capita, World Atlas (2021) for distances in kilometres between main economic centres and European Commission (2021) and CEFTA Portal (2021) for completing dummy variables CEFTA and SAA, respectively. According to Standard International Trade Classification – Revision 4, concept of agri-food products in this research includes 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, and 43.

4. Results

4.1. Global competitiveness

Before analysing the competitiveness of the agri-food sector, the global competitiveness of the Western Balkan economies will be analysed based on the Global Competitiveness Index 4.0 (GCI). Covering 140 economies, the GCI measures national competitiveness, defined as the set of institutions, policies, and factors that determine the level of productivity (World Economic Forum, 2021). This index was created based on many indicators grouped into 12 pillars, and the results for Western Balkan economies are shown in Figure 1.

Figure 1. *Global competitiveness index of the Western Balkan economies in 2018*



Source: The authors' calculations on the basis of World Economic Forum, 2021

The first noticeable thing is that all Western Balkans economies are at a similar level of competitiveness in terms of all indicators, which indicates the potential of creating a single market in this region as envisaged by the Action Plan for a Common Regional Market (CEFTA, 2021). Second, Serbia, which is also the best-ranked economy in the region (ranked 65th), stands out in terms of indicators related to infrastructure (Pillar 2) and market size (Pillar 10). Regional infrastructure projects mediated by the EU would significantly improve the position of other economies. Third, perhaps the biggest problem of the Western Balkan economies is the low level of innovation capability (Pillar 12) and the lack of quality institutions and administration (Pillar 1).

4.2. Trade and comparative advantages

The economic importance of the agri-food sector is reflected in the relatively high share of these products in total exports (Table 2). The largest share of agri-food products in total exports is evident in Serbia, which was 20.5% on average for the analysed period. The high importance of exports of these products is also observed in Montenegro and North Macedonia, where it was 14.9% and 14.7% averagely, respectively. A slightly smaller share of exports of agri-food products is evident in Albania and Bosnia and Herzegovina, where it was 8.3% and 8.2%, respectively. The largest exporter of agri-food products from the Western Balkans is Serbia, which exported value was more than 2.5 billion dollars on average in the analysed period. Also, in the analysed period, all economies recorded an increase in exports of agri-food products, while the average

annual growth rate was the highest in Albania (11.2% on average per year). The growth of exports is undoubtedly a consequence of the changed conditions of foreign trade, i.e. the liberalization of the market with the EU and CEFTA economies, which are the main foreign trade partners of the Western Balkans.

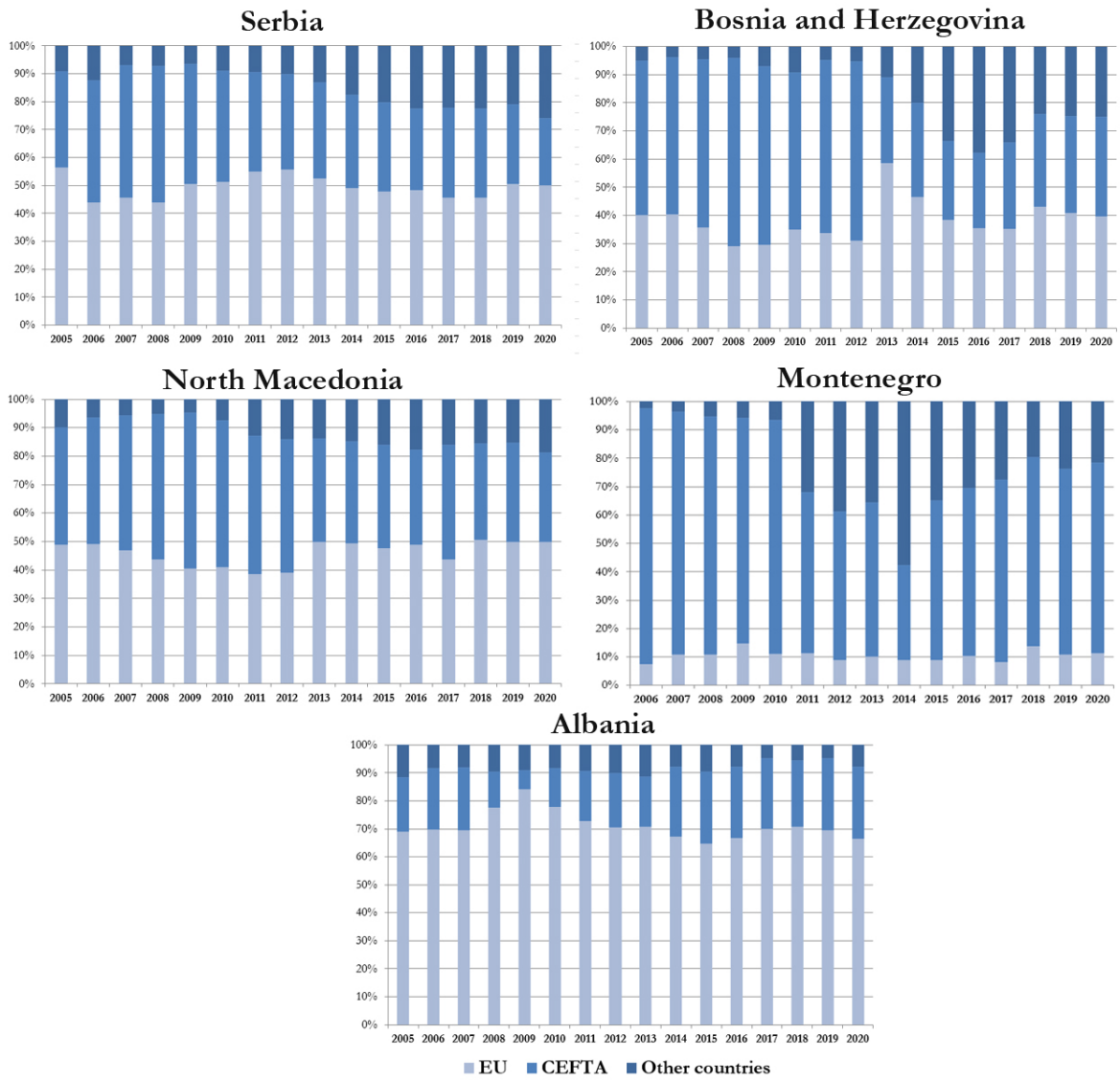
Table 2. *Value of the agri-food export in a million USD and share of the export of agri-food products in total export in the Western Balkans*

	Serbia		Bosnia and Herzegovina		North Macedonia		Montenegro		Albania	
Year	Mill. USD	%	Mill. USD	%	Mill. USD	%	Mill. USD	%	Mill. USD	%
2005	922	**20.6%**	181	**7.6%**	345	**16.9%**			60	**9.1%**
2006	1,267	**19.7%**	217	**6.3%**	399	**16.6%**	51	**9.3%**	71	**8.9%**
2007	1,686	**19.1%**	272	**6.5%**	474	**14.1%**	56	**9.0%**	87	**8.1%**
2008	1,956	**17.8%**	344	**6.8%**	555	**18.4%**	64	**10.4%**	96	**7.1%**
2009	1,944	**23.3%**	333	**8.4%**	499	**18.5%**	60	**15.4%**	86	**8.0%**
2010	2,243	**22.9%**	407	**8.5%**	559	**16.7%**	67	**15.3%**	98	**6.4%**
2011	2,480	**21.1%**	471	**8.1%**	650	**14.5%**	79	**12.6%**	123	**6.3%**
2012	2,707	**24.1%**	456	**8.8%**	614	**15.3%**	82	**17.5%**	130	**6.6%**
2013	2,804	**19.2%**	504	**8.9%**	669	**15.7%**	82	**16.6%**	151	**6.5%**
2014	3,072	**20.7%**	481	**8.2%**	644	**13.0%**	128	**29.0%**	99	**4.1%**
2015	2,870	**21.5%**	492	**9.6%**	1,078	**24.0%**	64	**18.1%**	145	**7.6%**
2016	3,186	**21.5%**	553	**10.4%**	586	**12.3%**	60	**16.8%**	201	**10.3%**
2017	3,164	**18.7%**	636	**10.0%**	607	**10.7%**	59	**13.9%**	233	**10.1%**
2018	3,370	**17.5%**	548	**7.6%**	641	**9.3%**	59	**12.6%**	268	**9.3%**
2019	3,627	**18.5%**	485	**7.4%**	697	**9.7%**	58	**12.6%**	293	**10.8%**
2020	4,150	**21.3%**	518	**8.4%**	676	**10.2%**	58	**14.2%**	343	**13.7%**

Source: The authors' calculations on the basis of the UN Comtrade Database, 2021

The analysis of the geographical allocation of exports of agri-food products from the Western Balkans shows that the largest percentage of these products is exported in EU economies: in Serbia, about 49% of agri-food products are exported to EU economies on average annually for the period 2005-2020 while at the same time these products were exported from other economies to the EU: Bosnia and Herzegovina 38%, North Macedonia 46%, Albania 72%. Exports of agri-food products from Montenegro to EU economies accounted for about 10% of exports of these products. For products from Montenegro, the dominant market is CEFTA economies, with an average of 66% of these products are exported annually for the analysed period. In the remaining economies of the Western Balkans, the CEFTA market is also significant, so in the analysed period on average, it is exported to this market: from Serbia 36% of total exports of agri-food products, from Bosnia and Herzegovina 46%, from North Macedonia 42% (Figure 2).

Figure 2. *Regional structure of export of agri-food products in the Western Balkans*

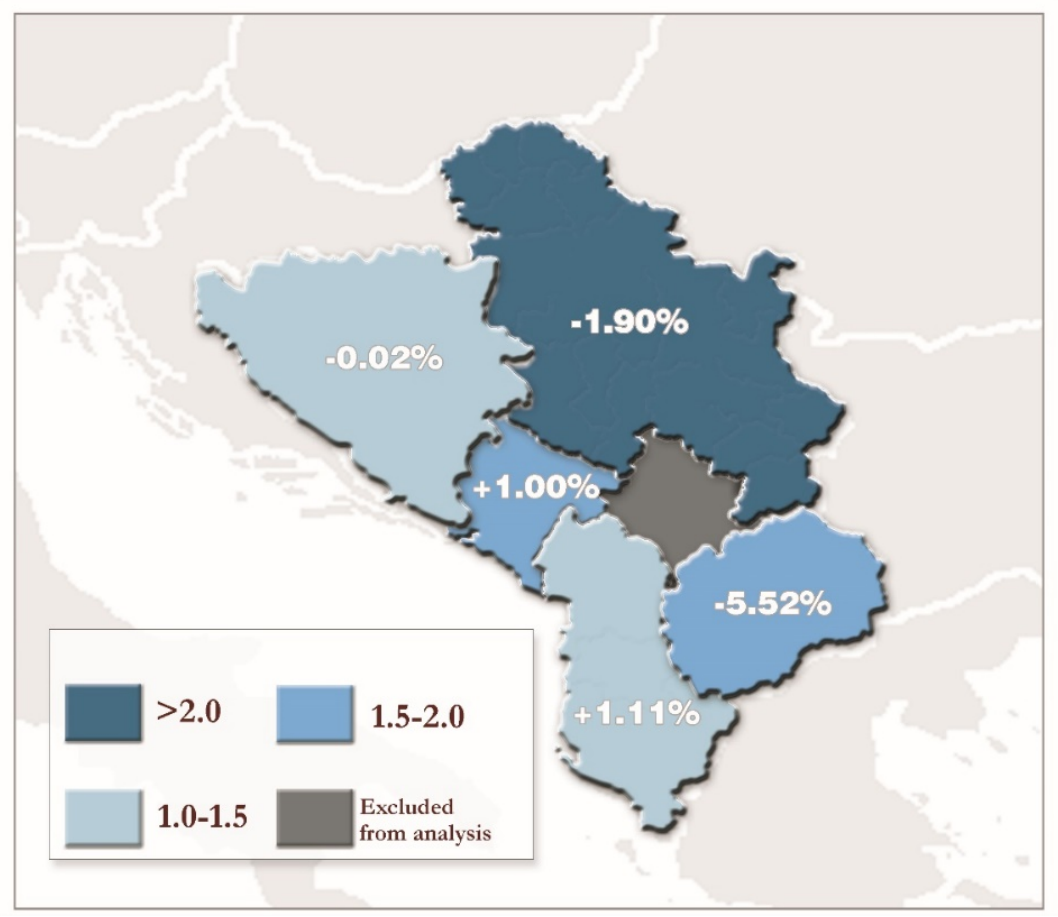


Source: The authors' calculations on the basis of the UN Comtrade Database, 2021

The percentage of exports of agri-food products to other Western Balkan economies is at a slightly lower level only in Albania, which is logical because of the large differences between the Albanian market and other Western Balkan economies, which were part of the former Yugoslavia. Foreign trade between Albania and other Western Balkan economies is low, primarily due to large differences in language, religion, and historical circumstances affecting trade. Namely, the population's ability to communicate directly and the similar religious structure of the population are two secondary factors that influence the formation of foreign exchange between economies (Trivić and Klimczak. 2015).

Analysing the index of revealed comparative advantages, it can be noticed that in the analysed period, on average, all economies have comparative advantages in the export of agri-food products, with average values higher than 1 (Figure 3). The highest level of comparative advantages is observed in Serbia, while the lowest level is in Albania. An unsatisfactory level of revealed comparative advantages in Albania has been recorded for most of the years, but there has been a slight increase at an average annual rate of 1.1%. In addition to Albania, Bosnia and Herzegovina have a low level of comparative advantages, while in Montenegro and North Macedonia, the RCA index is at a higher level, but North Macedonia also records the highest average annual rate of decline, of 5.5% per year. As already mentioned, in some Western Balkans economies, there are negative tendencies in the trend of the index of revealed comparative advantages. One of the reasons may be inadequate reactions to improving competitiveness required by the world market in regional and international integration and relatively poorer export performances (Matkovski et al., 2016).

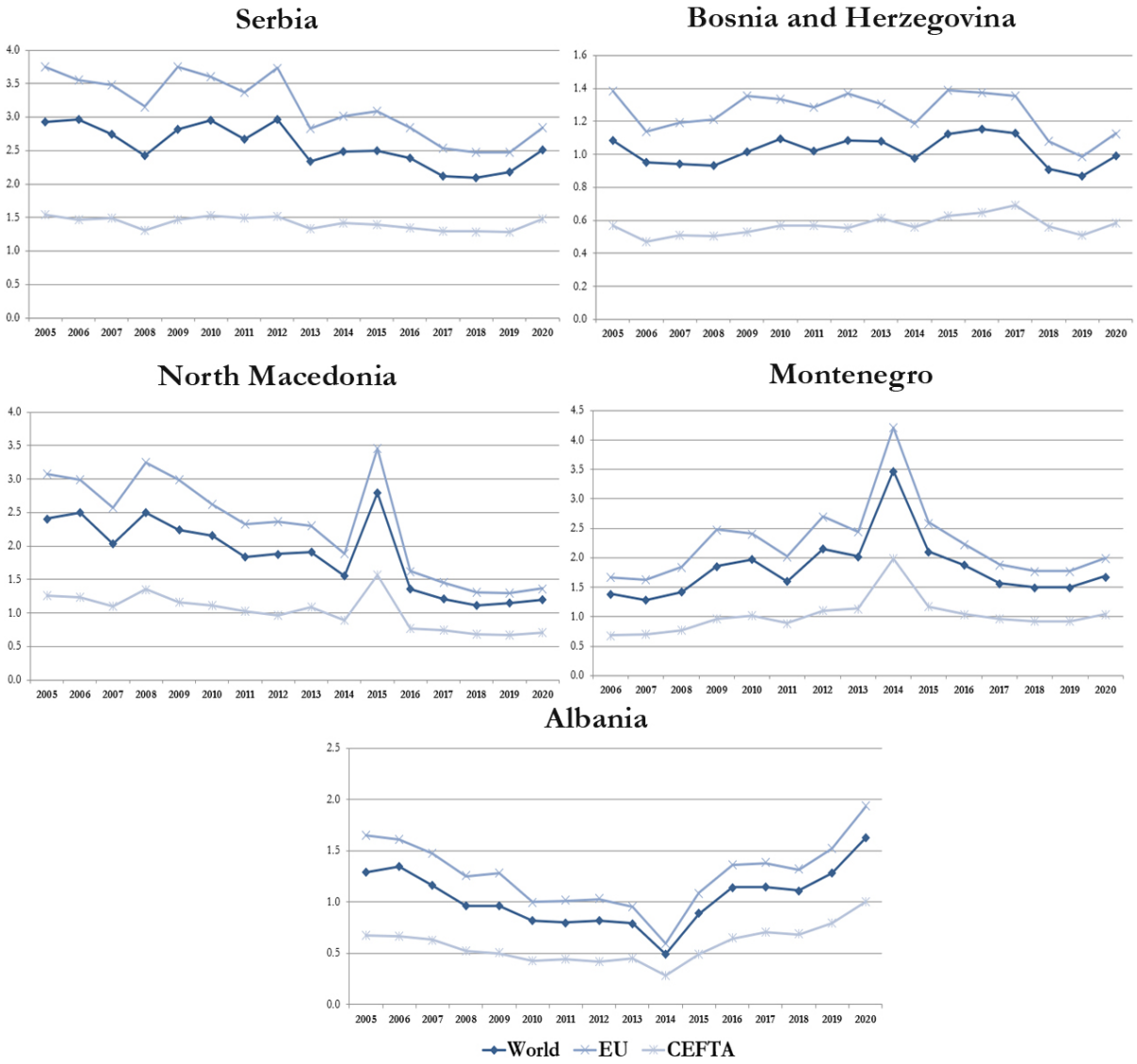
Figure 3. *Level of the revealed comparative advantages in the Western Balkans and its changes in the period 2005-2020*



Source: The authors' calculations on the basis of the UN Comtrade Database, 2021

Considering the differences in comparative advantages in the export of agri-food products by individual foreign trade partners (Figure 4), it can be concluded that all Western Balkan economies have a high level of comparative advantages in the export of these products on the EU market; Serbia has strong comparative advantages. North Macedonia and Montenegro have significant comparative advantages, while comparative advantages in the export of agri-food products from Bosnia and Herzegovina and Albania have been revealed at a satisfactory level.

Figure 4. *Revealed comparative advantages of agri-food products in the Western Balkans*



Source: The authors' calculations on the basis of the UN Comtrade Database, 2021

In the export of agri-food products to the markets of other economies in the region (CEFTA), Serbia, North Macedonia and Montenegro have a satisfactory level of revealed comparative advantages, while Bosnia and Herzegovina and Albania do not have comparative advantages in exporting these products to the region. The main reason for

the lack of comparative advantages in the mentioned two economies, having in mind the way of calculating the index of revealed comparative advantages, should be sought in the similar trade structure of these economies, but also in the previously mentioned changes in the regional structure of agri-food exports from these economies. Albania's lower trade with the economies of the region and lower levels of comparative advantages are various historical economic circumstances that have meant a closed market for years and have affected the somewhat lower level of foreign trade between these economies.

4.3. Estimation of gravity model

The selection of an adequate model using panel data is a particular challenge in the procedure of estimation. The initial model specification is the Random Effects (RE) model, where the Breusch-Pagan test is used to analyse whether the Ordinary Least Square (OLS) or RE model is more suitable. Results of Breusch-Pagan test showed that RE is preferred (Table 3).

Table 3. *Estimation of the gravity model of export of agri-food products in Western Balkans using OLS. FE and RE models*

Dependent Variable: X_{ijt}				
Variable	**ORDINARY LEAST SQUARE (OLS)**			
	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
Constant	9.8931	1.0926	9.0547	<0.0001
Y_{jt}	0.740843	0.0393807	18.8124	<0.0001
Y_{jt}/L_{jt}	−0.28423	0.0834936	−3.4042	0.0007
D_{ij}	−1.75695	0.106002	−16.5747	<0.0001
B_{ij}	2.00608	0.198828	10.0895	<0.0001
$CEFTA_{ijt}$	0.848217	0.213595	3.9711	<0.0001
SAA_{ijt}	0.151389	0.121709	1.2439	0.2137
R-squared	0.314415	Adjusted R-squared		0.312766
F-statistic	190.6286	Prob(F-statistic)		0.0000
Total observations		2,501		
Dependent Variable: X_{ijt}				
Variable	**FIXED EFFECTS (FE)**			
	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
Constant	−24.4121	11.8192	−2.0655	0.0390
Y_{jt}	1.05999	0.707377	1.4985	0.1341
Y_{jt}/L_{jt}	1.10505	0.691899	1.5971	0.1104
D_{ij}	0.0401595	0.176272	0.2278	0.8198
B_{ij}	0.461989	0.0826077	5.5926	<0.0001
$CEFTA_{ijt}$	−24.4121	11.8192	−2.0655	0.0390
SAA_{ijt}	1.05999	0.707377	1.4985	0.1341
R-squared	0.837401	Adjusted R-squared		0.097271
F-statistic	62.61453	Prob(F-statistic)		0.000000
Durbin Watson (DW)	1.394027			
Total observations		2,501		
Dependent Variable: X_{ijt}				
Variable	**RANDOM EFFECTS (RE)**			
	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
Constant	4.46302	3.15189	1.4160	0.1569
Y_{jt}	0.881395	0.131076	6.7243	<0.0001
Y_{jt}/L_{jt}	0.651409	0.187159	3.4805	0.0005
D_{ij}	−2.87796	0.346289	−8.3109	<0.0001
B_{ij}	2.52479	0.733722	3.4411	0.0006
$CEFTA_{ijt}$	0.360814	0.168331	2.1435	0.0322
SAA_{ijt}	0.491333	0.0807794	6.0824	<0.0001
Hausman test	39.2055 (0.0000)	Breusch-Pagan test		7213.47 (0.0000)

Total observations	2,501

Source: The authors' calculations.

The next step is the selection process between the Fixed Effects (FE) and RE models using the Hausman test. The results of the Hausman test showed that FE was preferred. However, the problem of estimation in the FE model is the impossibility of estimating the effects of distance and border, since they do not change over time. Additionally, an autocorrelation problem is detected in the estimated FE model, as the Durbin-Watson test shows the presence of autocorrelation, since the test value is lower than the lower critical value (Table 3).

In order to eliminate the problem of inefficient estimation of regression parameters in the presence of autocorrelation in the model of FE, the gravity model of exports of agri-food products was evaluated by the Weighted least squares (WLS) method. WLS in the process of minimizing the sum of the squares of the residuals gives a lower weight to those residues that are higher in absolute value, and vice versa. The results of the evaluation of the gravity model of exports of agri-food products from the Western Balkans using WLS (Table 4) show that the impact of demand factors on exports of these products is significant and positive, which shows a positive sum of the coefficient of elasticity Y_{jt} и Y_{jt}/L_{jt}, as an approximation of demand. The results show that with the unchanged level of other factors, with a one percent increase in demand, exports of agri-food products from the Western Balkans increased by an average of 0.37% ($\beta_1 + \beta_2$). The distance between the main economic centres of the Western Balkans and their main foreign trade partners has a significant and negative impact on the export of agri-food products. In contrast, the shared border with some Western Balkan economies has a significant and positive impact on exporting agri-food products.

Table 4. *Estimation of the gravity model of export of agri-food products in Western Balkans using WLS model*

Variable	Dependent Variable: X_{ijt} Weighted Least Square (WLS)			
	Coefficient	Std. Error	t-Statistic	Prob.
Constant	9.82596	0.52281	18.7945	<0.0001
Y_{jt}	0.724001	0.0197977	36.5700	<0.0001
Y_{jt}/L_{jt}	−0.34888	0.0437943	−7.9663	<0.0001
D_{ij}	−1.60819	0.0604347	−26.6104	<0.0001
B_{ij}	2.21873	0.0856536	25.9035	<0.0001
$CEFTA_{ijt}$	0.731533	0.0809503	9.0368	<0.0001
SAA_{ijt}	0.419269	0.0603057	6.9524	<0.0001
Sum squared resid	2448.731	S.E. of regression		0.990883
R-squared	0.733670	Adjusted R-squared		0.733029
F(6. 2494)	1145.054	P-value(F)		0.000000
Log-likelihood	−3522.354	Akaike criterion		7058.708
Schwarz criterion	7099.479	Hannan-Quinn		7073.509
Total observations		2,501		

Source: The authors' calculations.

Regarding the effects of trade agreements (CEFTA and SAA) on agri-food exports to the Western Balkans, the results of the estimated WLS model show that both agreements had a significant and positive impact on agri-food exports of these economies. The CEFTA contributed to the growth of exports of agri-food products of the Western Balkan economies by an average of 107.85%. The agreement with the EU economies (SAA) had

a slightly weaker impact on export growth and significant and positive. The results of the estimated model show that this agreement affected the growth of exports of agri-food products of the Western Balkan economies by an average of 52.08%. This result is expected, bearing in mind that in the analysed period, there was a liberalization of exports with the economies of the region (CEFTA from 2007), and that the export of agri-food products to the EU market was enabled even earlier with Autonomous Trade Measures. In addition, it was previously mentioned that the economies of the Western Balkans are close trading partners, i.e. that all economies of the Western Balkans, except Albania, were part of the former Yugoslavia, so it is natural that a large part of exports are placed in these economies. It has been proven that geographical distance and border are important factors in foreign trade.

5. Discussion

The research results showed that **Serbia** in the regional framework shows the best results in foreign trade in agri-food products, as well as the highest level of comparative advantages. Additionally, previous research of comparative advantages of agri-food export of Serbia pointed out that there had been improvement of comparative advantages of agri-food export on the EU market, CEFTA region, and other significant trade partners. The global financial crisis in 2008 deteriorated this trend for a while, but this did not stop intensified trade of agri-food that CEFTA brought through trade liberalization (Matkovski et al., 2017). According to Marković et al. (2019), to improve the competitiveness of Serbian foreign agri-food trade, quantity growth of export value should not be the only goal but mainly improving its value through structural adjustments and product differentiation.

Bosnia and Herzegovina has relatively low export performances on the global market. Looking at the agri-food export and import trends of Bosnia and Herzegovina with CEFTA economies through their intra-industry foreign trade, Brkić et al. (2021) noticed how certain variables had positive effects impact on intra-industry agri-food trade between Bosnia and Herzegovina and economies of CEFTA region in 2008-2018 period. These variables are the size of economies measured through GDP, ethnic origin and similarities, territorial borders between economies, and economic integration realised with trade liberalization. Variables that had a negative impact on intra-industry agri-food trade were differences in productivity and GDP per capita. Changes in the share of agri-food foreign trade in total trade with CEFTA region were noticed after accession of Croatia in EU, and these noticeable changes were mostly noticed in structure and geographical orientation of foreign trade of Bosnia and Herzegovina towards CEFTA economies with markedly lesser importance of this region for its foreign trade (Brkić and Sušić, 2019).

The position of **North Macedonia** in foreign trade of agri-food products with CEFTA region was estimated as positive because of trade liberalization, but with still great dependency on import with the foreign trade deficit in the trade of agricultural products. Causes for this can be found in insufficient competitiveness, problems with produced

amounts of food and low level of production and export of product with more added value (Mojsovska, 2019) which is characteristic of production and industry for all Western Balkan economies.

Exports of agri-food products from **Montenegro** are modest, given the low production potential, so export performances are relatively low. The unsatisfactory development of the agricultural sector had a negative impact on Montenegro's competitiveness in agri-food foreign trade. Import dependency and food insecurity were rated as largest compared to other CEFTA economies, so Montenegro was in the most unfavourable position among all these economies (Jovanović et al., 2015). Low productivity and neglected agriculture with abandonment of rural areas are main reasons for lack of comparative advantages in agri-food export, but of more concern is still great import dependency (Fabris and Pejović, 2012) mostly from CEFTA region and EU. As a result, export is mainly oriented towards CEFTA region, but of small value (Zekić and Matkovski, 2019).

As an economy with great agricultural potential, **Albania** has not used its possibilities for improving export of agricultural products in CEFTA economies (although the delayed reaction is expected that will improve its position), but its export remained constant after its original growth as a result of accession in free trade arrangement. Main reasons behind this slower growth of export, are still present administrative barriers, custom and other procedures and measures (Braha et al., 2017). Still, importance of CEFTA on Albania as former most isolated country in Europe, cannot be neglected and this can be confirmed through results that showed positive effects on Albanian trade as a whole with CEFTA region that was possible because of less protectionism in comparison to years prior CEFTA (Choi and Minondo, 2019).

Competitiveness of agri-food sector on the level of whole region implies the need for improved competitiveness because of the importance of agriculture and especially agri-food sector for all mentioned economies of CEFTA region. All of them are in difficult situation because of the external pressures coming mainly from EU. In order to improve its competitiveness, partial productivity improvement is needed and recommended which will benefit comparative advantages that are estimated as relatively acceptable for all Western Balkan economies (Matkovski et al., 2019).

There are a few threats to the further integration of the Western Balkan region which are not in the scope of this research. First, European integration of the Western Balkan economies has slowed down significantly due to global crises caused by the COVID-19 virus. In addition to the health threat, the pandemic is a potential cause of the political and economic crisis. According to Bieber et al. (2020), greater regional cooperation is necessary to prevent new polarization and tensions, and the EU should include the region in planning for post-COVID-19 reconstruction. Also, as Crescenzi et al. (2020) stated, individual EU member states have become sceptical about any further progress of the process of economic and political integration. Namely, some economies insist on more policy autonomy, and sometimes they also rethink the core values of the EU (for

example, critique of liberal democracy in Hungary and challenge of centrally imposed fiscal constraints in Italy). Additionally, the migrant crisis has caused the rise of nationalism throughout the EU, especially in border states. Because of all these crises, regional cooperation and coordination will be especially important in preventing new polarization and tensions.

However, this research has some **limitations**. Limitations connected with the usage of the RCA index are problems of its utility in comparative studies because it only shows the relative position of economies, but at the same time is considered as a good indicator of comparative advantages of commodities. Furthermore, it is highlighted that this index tends to address biased comparative advantages that are found. Because of these limitations, results can often be inconsistent, especially for economies with a smaller share of export on the global market. Also, it is not easy to include all factors in the process of econometric estimation using the gravity model, so the model includes only most significant factors that affect the export of agri-food products in the Western Balkans. Due to problem of quantifications, indicators that represents potential trade barriers in agri-food chains are not included in estimated model. Previous research showed that these barriers have been significant in cross-border regional trade among CEFTA (Krasniqi et al., 2019).

The research results have certain **theoretical and practical implications** of trade agreements for the export of agri-food products and changes in the level of comparative advantages, which is important from both macroeconomic and microeconomic aspects. Given that liberalization also poses a threat to the agri-food sector, the research results may indicate economies where additional efforts are needed to improve competitiveness. The results of the research could be useful for agricultural policymakers, in terms of more effective support to the agri-food sector, which would contribute to "favouring" domestic producers, and at the same time, increase competitiveness in the international market. **Future research** can be directed towards a more detailed review of the competitive positions of certain segments of agri-food products and analysis of factors influencing changes in the competitiveness of agri-food products in the international, regional and EU markets.

5. Conclusions

In the field of foreign trade, in all economies of the Western Balkans, there has been an intensification of the exchange of agri-food products and a partial change in the orientation of the exchange. In all Western Balkans economies, there is an increase in exports of agri-food products, and the analysis of the geographical allocation of exports shows that most of these products are placed in EU economies, followed by CEFTA economies. Considering the comparative advantages of agri-food products of the Western Balkan economies, it can be noticed that all economies have comparative advantages on the international market. Serbia has the highest level of comparative advantages in this sector, while the most unfavourable situation is in Albania, which in

most years does not achieve a satisfactory level of comparative advantages in exporting these products to the international market.

The econometric research results show the impact of the liberalization of trade in agri-food products on exports in the Western Balkans by applying the gravity model. The estimated export model of agri-food products indicates a significant growth of exports with changing demand, a significant and negative impact of distance between economies, and a significant and positive impact of the shared state border on exports of these products. The regional integration with the CEFTA has significantly contributed to the intensification of exports of agri-food products in these economies. The SAA has also made a significant and positive contribution to the export of these products.

The econometric research results clearly indicate the impact of the CEFTA on the intensification of exports of agri-food products. The economies of the Western Balkans are natural trading partners. Most of these economies were part of the single market of the former Yugoslavia, and significant benefits can be achieved by reintegrating the market established by the CEFTA. Also, the Western Balkans economies represent economies with a similar level of economic development, i.e. a similar level of competitiveness measured by GCI, so the placement of agri-food products is more accessible than the placement on the much more demanding EU market. The EU market is highly demanding in terms of quality standards, but it is difficult to achieve the appropriate quantity and stability of supply for this market. Because of that, efforts in the economies of the Western Balkans must be directed towards the integration of the producers themselves, but also towards the fulfilment of the required standards by this market and the encouragement of exports of agri-food products of higher value. In this way, the economies of the Western Balkans could make greater use of the opportunities provided by liberalization with the EU market, which was established with the SAA.

Through successful **testing of the main research hypothesis**, the research results indicate that CEFTA integration processes dominantly affect the export of agri-food products in the Western Balkans, and the main hypothesis was confirmed. Furthermore, sub-hypotheses were also confirmed, given that the research clearly showed that the liberalization of trade in the Western Balkans had a significant impact on shaping the level of comparative advantages of agri-food products on the international market. Also, the gravity model results indicate that CEFTA statistically significantly influenced export of agri-food products in the Western Balkans.

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