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## HOW CEFTA INFLUENCED THE COMPETITIVENESS OF AGRI-FOOD TRADE IN THE WESTERN BALKANS

**ABSTRACT:** *The regional integration with the CEFTA significantly influenced the liberalisation of the market, which led to an increase in exports of agri-food products in the 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 markets. In this 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 exporting on the international market. Results of the gravity model estimation showed that free trade agreements with the CEFTA positively affected the intensification of agri-food product exports. Western Balkan economies have similar economic development and competitiveness levels. Thus, reintegrating the market established by CEFTA affected the export of agri-food products.*

**KEY WORDS:** *CEFTA, agri-food trade, Western Balkans, revealed comparative advantages, gravity model.*

**JEL CLASSIFICATION:** Q17, Q18, F15.

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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 between Poland, Hungary, and Czechoslovakia in Krakow on December 2, 1992. As Kupich (1999) noted, the 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 have left it by joining the EU. Today, all the members of the CEFTA agreement are Southeast European economies, i.e. the economies of the Western Balkans (Serbia, North Macedonia, Bosnia and Herzegovina, Albania, and Montenegro) and Moldova.

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 significantly affected 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 means of strong regional cooperation, the CEFTA can play an indirect role in the elimination of political disagreements between these economies. As Petreski (2013) emphasised, strengthening cooperation, reducing non-tariff barriers, the mutual attraction of foreign investments, harmonisation 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.

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 realised 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 the agri-food trade competitiveness of Western Balkan economies. This impact will be examined through analysis of the comparative advantages and estimation of the gravity model. Based on this goal, two **hypotheses** are created:

- *CEFTA significantly improved export flows of agri-food products in Western Balkans;*
- *CEFTA significantly influenced the comparative advantages of the export of agri-food products in the Western Balkans.*

It is indeed rare to find this methodology used to achieve such a research goal and test these hypotheses in the context of the agri-food sector of the Western Balkan countries. The above methods provide a broader picture of the effects of CEFTA on the foreign trade positions of the analysed sector. This is the reason for this study, as there is a lack of papers analysing trade and competitiveness in the agri-food sector compared to trade and competitiveness in the industrial sector. On the other hand, the main motivation is to fill the gap in the literature on the effects of trade agreements on the above sector. With its originality in research and defined policy implications, the paper will undoubtedly contribute to filling the gap in the literature.

The paper is divided into several sections. After the introduction, a detailed review of the literature is presented. This is then followed by an explanation of the basic methods of this research and the databases used. Next, the research results are divided into three parts: global competitiveness, trade and comparative advantages, and gravity model estimation. The discussion and conclusion are the last two sections of this paper.

## **2. LITERATURE REVIEW**

The analysis of competitiveness is very complex because it can be conducted using different approaches, and this is confirmed by the numerous definitions of competitiveness (there is no universal definition), defined levels and forms of competitiveness, and different ways of measuring and expressing it. This is one of the main disadvantages of competitiveness analysis; the problem of defining the meaning of the term and the wide varieties of competitiveness determinants in space and time (Siudek & Zawajska, 2014). In the literature, competitiveness is generally divided into micro and macro levels at the company or country level, but some authors include the term meso competitiveness to describe regional competitiveness or the position of some part of the industry in revealing the competitiveness of an economy (Jambor & Babu, 2016). It is more common to look at competitiveness from new perspectives that go beyond traditional ways of viewing the Gross Domestic Product (GDP) to analyse the position of an economy in international comparison (Aiginger et al., 2013). New approaches to measuring competitiveness are becoming more common as economies become more integrated in the world market of developed globalisation (Önsel et al., 2008). Competitiveness is often connected with the term comparative advantages, although these two terms should not be mistakenly equated, because they have some differences (Frohberg & Hartmann, 1997). Competitive advantages are based on comparative advantages, but many other factors determine the competitiveness of a country (Bhawsar & Chattopadhyay, 2015). The strength of comparative advantage is that it takes into account the intrinsic advantage of a particular export commodity and is consistent with changes in the relative factors and productivity of the economy (Maryam et al., 2018).

One of the indicators used in analysing the competitiveness of the agri-food trade is the index of revealed comparative advantages (RCA) on the global market (Balassa, 1965), which can be employed to reveal strong and weak points of development of the agri-food sector in different economies. Also, the index can show comparative advantages of some sectors of an economy compared to other economies while those sectors could have negligible impact on the domestic economy (Hinloopen & Marrewijk, 2001). According to Bojnec and Fertő (2018), the duration of the comparative advantages of economies can also be measured by the RCA index within regions with trade agreements or trade unions. Costinot et al. (2012) made a theoretically consistent alternative to RCA by putting

productivity differences at the forefront of the analysis of a central question in international economics. In the literature, more alternative indexes of comparative advantages have also been used in recent studies (Yu et al., 2009). Other indexes employed in the literature are the net trade index, the index of current competitiveness, productivity, Grubel-Lloyd index, the global index of competitiveness, and many others. French (2017) concluded that certain indexes could be usefully employed for certain tasks, as no single ideal index is appropriate for all tasks. According to Mizik (2021), the choice for measuring competitiveness depends on the available datasets, as well as on the choice of the researcher.

A gravity model is often used in the literature to describe the effects of foreign trade liberalisation and integration through the application of free trade agreements. The model was initially derived from Newton's law of gravity, and was introduced in research on the international economy in 1962 (Tinbergen, 1962). The equation of the gravity model was defined as empirically complete at that time, although some indications of the gravity model of international trade can be found as early as the 18th century (1776) in the works of Adam Smith through his research on the bilateral volume of trade as a function of the size of an economy and the distance between economies. These were considered as elements of and reasons for the growing wealth of nations spilling over into foreign economies through international trade (Elmslie, 2018). In the equation of the gravity model, trade between two economies is considered to be proportional to the GDP of economies and inversely proportional to their territorial distance, these being the main factors of a model. More frequent use of this model, which is considered an empirical success although it initially had theoretical shortcomings (Bergstrand, 1985), brought new variables other than GDP and distance into research on international trade between economies. The variables are political, institutional, geographical, historical, communicational, and cultural. These factors can either improve or limit trade while reducing or creating trade barriers between economies (DeRosa, 2008; Trivić & Klimczak, 2015), and these factors are of particular interest when specific attributes of the Western Balkans and its trade are considered. Although traditional models neglected the influence of certain variables on trade, the gravity model allows us to see the influence of geographical distance, which reduces trade, as well as comparative advantages, which promote trade (Eaton & Kortum, 2002).

Anderson and van Wincoop (2003) developed a method that consistently and efficiently estimated the gravity model and concluded that national borders reduce trade between industrialised countries by moderate amounts of 20-50%. A wider range of possible uses of the model resulted in its application in the trade analysis of inter- and intra-trade between regions, with special utilisation in questioning the effects of free trade through preferential bilateral agreements (Nguyen, 2019) and customs unions (Urata & Okabe, 2010) that have impacted the development of regionalism (Martinez-Zarzoso, 2003). The effects of free trade agreements can also be noticed in agri-food trade at a regional level (Grant & Lambert, 2005).

Arkolakis et al. (2012) investigated how micro-level data, as part of a new and richer quantitative trade models, showed larger gains from trade but concluded that this is not the case. They suggested, however, that these data should be used in combination with trade models. A significant contribution to theoretical and empirical gravity modelling was provided by Head and Mayer (2014), who facilitated the diffusion of best-practice methods by illustrating their application and concluded that estimation of the gravity model was just a first step before a deeper analysis of the implications of the results (in terms of welfare). Additionally, Baier et al. (2014) developed an estimation of economic integration agreements on international trade flows to account for the endogeneity of such agreements. This type of modelling has led to larger and more precise estimates.

The index of RCA has been used in the literature to determine the export competitiveness of the agri-food sector of individual Western Balkan economies and at the regional level. It has been used in some research on export competitiveness in the Western Balkan market and CEFTA (Miteva-Kacarski, 2018; Marković & Marjanović, 2019; Matkovski et al., 2021) and in research on the export competitiveness of agri-food products of individual economies (Cvetković & Petrović-Randelović, 2017) and the whole region of the Western Balkans (Matkovski et al., 2016). Research by the authors Matkovski et al. (2016) showed that all the economies of the Western Balkan region, except Albania, have comparative advantages in the export of agri-food products.

Using the gravity model, some examples in the literature so far deal with the estimation of the effects of CEFTA on the trade of agri-food products in the

Western Balkans at the level of one economy or for the whole region. So far, research for Serbia has shown that trade liberalisation and CEFTA have had positive impacts on the agri-food sector and the trade of agricultural products, but there is certainly a place for further improvement of the economy's position as the spread of positive results was unevenly distributed. Results from research on the estimation of the gravity model for the period 2004-2012 showed that the market was characterised by an improved position of the Serbian agri-food trade and export growth in all the economies with whom Serbia signed free trade agreements (Dragutinović-Mitrović & Popović-Petrović, 2013). Furthermore, it was discovered that CEFTA had the greatest impact on intra-regional trade of the Western Balkan economies for the same period of observation because of the reduction in trade barriers. Western Balkan economies were in an inferior position compared to most EU economies because of the barriers still present in trade with the EU core and their much greater competitiveness (Dragutinović-Mitrović & Bjelić, 2015). According to the research of Matkovski et al. (2018a), in the 2005-2015 period, there was a deficit in the agri-food trade in all the Western Balkan economies, except for Serbia, while results of the estimations of the gravity model showed that CEFTA impacted unevenly on the individual exports of the economies of this region. The main trade partner of the Western Balkan economies was the EU, although intensified trade in agri-food was present inside the CEFTA region with similar tendencies in both export and import (Matkovski et al., 2018b). Also, 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 to take advantage of trade liberalisation 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 the literature dealing with problematic effects of the trade in agri-food products in the Western Balkans that simultaneously evaluate the effects of CEFTA using the gravity model and comparative advantages. Therefore, our research will contribute to filling this gap.

### 3. MATERIAL AND METHODS

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

$$RCA_{ij} = \frac{\frac{x_{ij}}{x_{it}}}{\frac{x_{nj}}{x_{nt}}} \quad (1)$$

where: X is exports; i is country; j is sector; t is total exports; and n is the group of exporting economies. When RCA is greater than 1, there are comparative advantages of the analysed sector. An RCA greater than 3 means a strong level, an RCA between 2 and 3 means a significant level, while values of RCA between 1 and 2 represent a satisfactory level of comparative advantages (Matkovski et al., 2022).

The effects of trade liberalisation induced by CEFTA are estimated using the gravity model with panel data. Since Tinbergen (1962), a number of specifications of this model have been derived, and this paper uses a linear form of the model similar to that in the paper of Dragutinović-Mitrović and Popović-Petrović (2013) and Matkovski et al. (2018b):

$$\ln X_{ijt} = \ln \alpha + \beta_1 \ln Y_{jt} + \beta_2 \ln(Y_{jt}/L_{jt}) + \beta_3 \ln D_{ij} + \beta_4 B_{ij} + \beta_5 CEFTA_{ijt} + \beta_6 SAA_{ijt} + \mu_{ij} + \lambda_i + u_{ijt} \quad (2)$$

where:

- $X_{ijt}$  is a dependent variable that represents the export value of agri-food products of exported economy i to the economy j in period t;
- $Y_{jt}$  is an independent variable that represents the GDP of the importer economy j in period t, while  $(Y_{jt}/L_{jt})$  is an independent variable that represents the GDP per capita of the importer economy j in period t. These two independent variables together represent a factor of demand of the

importer economy  $j$ , and it is expected that these two variables have positive effects on the export of agri-food products;

- $D_{ij}$  is an independent variable that represents the 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;
- $B_{ij}$  is a dummy variable that examines the effects of the shared border of economies  $i$  and  $j$ . Since a shared border, as a rule, increases trade exchange, this variable has a value 1 for the economies that have shared borders with the Western Balkan economy and a value 0 for other economies. It is expected that this variable has positive effects on the export of agri-food products;
- $CEFTA_{ijt}$  is 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;
- $SAA_{ijt}$  is a dummy variable that examines the effects of the 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;
- $\mu_{ij}$  stands for individual effects in the panel model which cover the specifics of bilateral trade between economies  $i$  and  $j$ ;
- $\lambda_t$  stands for the temporal effects in the panel model that vary over time, but not in county pairs;
- and  $u_{ijt}$  is a stochastic variable of the model.

The data sample includes exports from five Western Balkan economies (Serbia, Bosnia and Herzegovina, North Macedonia, Montenegro, and Albania) to the 38 most significant trade partners (economies of the EU, CEFTA, Turkey, the Russian Federation, Switzerland, Kazakhstan, and Belarus) in the period 2005-2020. Thus, 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 and StataIC 13 software, while an empirical base was completed using the UN Comtrade Database (2021) for the values of exports, the World Bank (2021) for values of GDP and GDP per capita, the World Atlas (2021) for distances in kilometres between the main economic centres, and the European Commission (2021) and the CEFTA Portal (2021) for completing the dummy

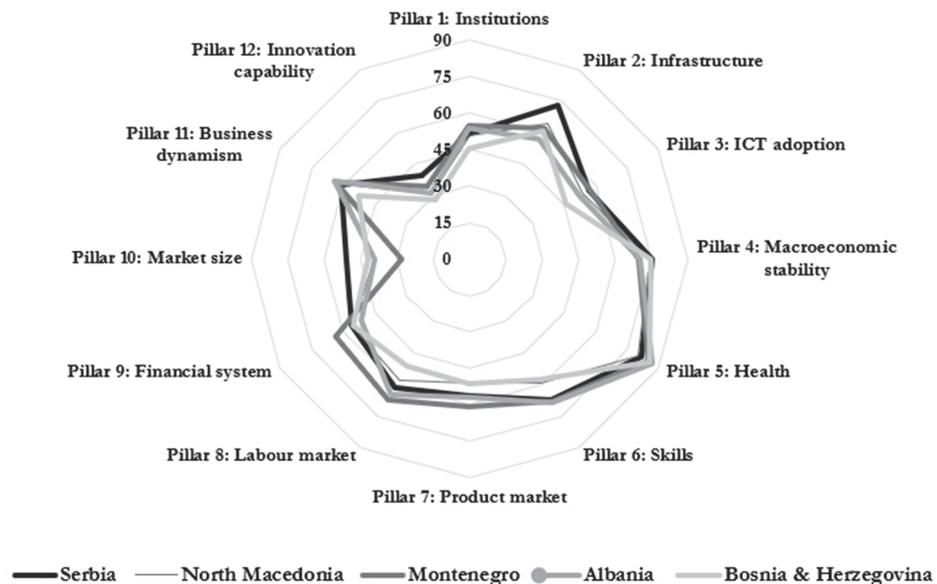
variables CEFTA and SAA. According to the Standard International Trade Classification – Revision 4, the concept of agri-food products (Matkovski et al., 2022) includes the following divisions and commodity groups: 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 11, 12, 21, 22, 261, 263, 264, 265, 268, 29, 41, 42, 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 using 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 on the basis of 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 the Western Balkan 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 65<sup>th</sup> globally), 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 1). 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 these exports averaged 14.9% and 14.7%, respectively. A slightly smaller share of exports of agri-food products is evident in Albania and Bosnia and Herzegovina, at 8.3% and 8.2%, respectively. The largest exporter of agri-food products from the Western Balkans is Serbia, with an average export value of more than 2.5 billion dollars in the analysed period. Furthermore, in the analysed period, all the economies recorded an increase in exports of agri-food products, with the average annual growth rate in Albania being the highest (11.2% on average per year). The growth of exports is undoubtedly a consequence of the changed conditions of foreign trade, i.e. the liberalisation of the market with the EU and CEFTA economies, which are the main foreign trade partners of the Western Balkans.

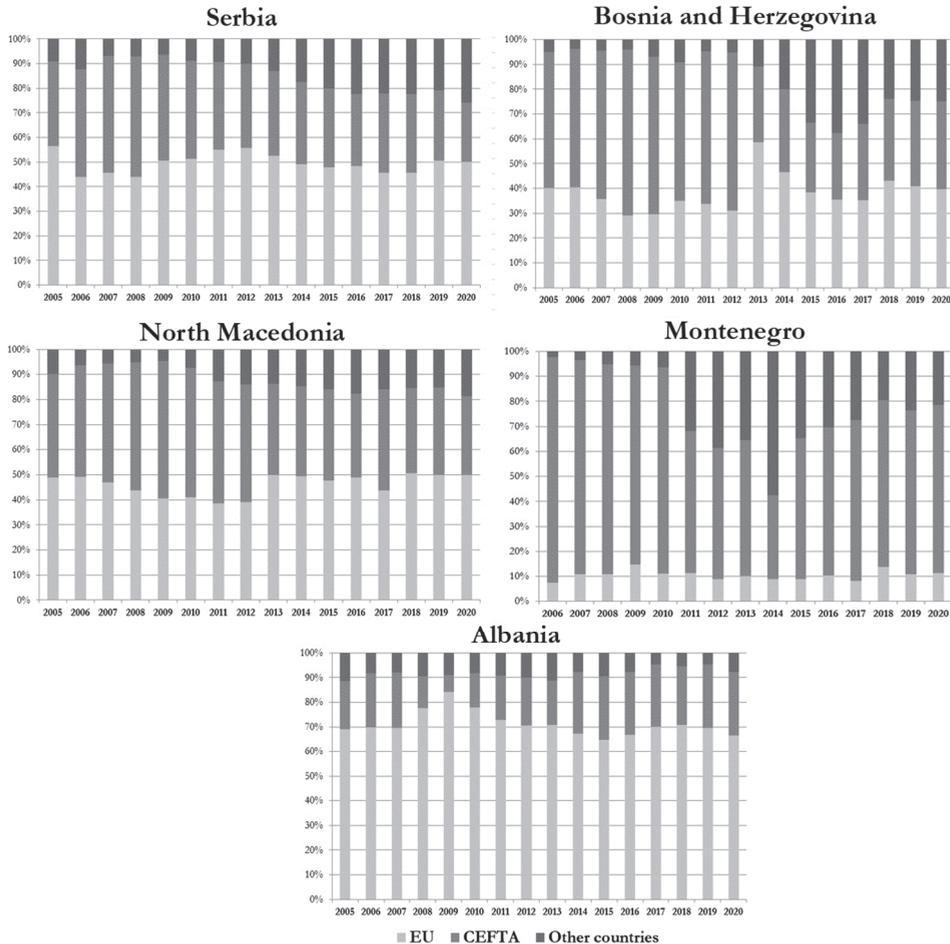
**Table 1.** Value of the agri-food exports in million USD and share of the export of agri-food products in total exports in the Western Balkans

| Year | Serbia    |       | Bosnia and Herzegovina |       | North Macedonia |       | Montenegro |       | Albania   |       |
|------|-----------|-------|------------------------|-------|-----------------|-------|------------|-------|-----------|-------|
|      | Mill. USD | %     | Mill. USD              | %     | Mill. USD       | %     | Mill. USD  | %     | Mill. USD | %     |
|      | 2005      | 922   | 20.6%                  | 181   | 7.6%            | 345   | 16.9%      |       |           | 60    |
| 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 were exported to EU economies: in Serbia, this amounted to an average of about 49% of agri-food products annually for the period 2005-2020, while at the same time exports of these products from other economies to the EU were as follows: 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 Montenegro, the dominant market is CEFTA economies, with an average of 66% of these products being exported annually in the analysed period. In the remaining economies of the Western Balkans, the CEFTA market is also significant, with average exports to this market in the same period accounting for 36% of total exports of agri-food products from Serbia, 46% from Bosnia and Herzegovina, and 42% from North Macedonia (Figure 2).

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



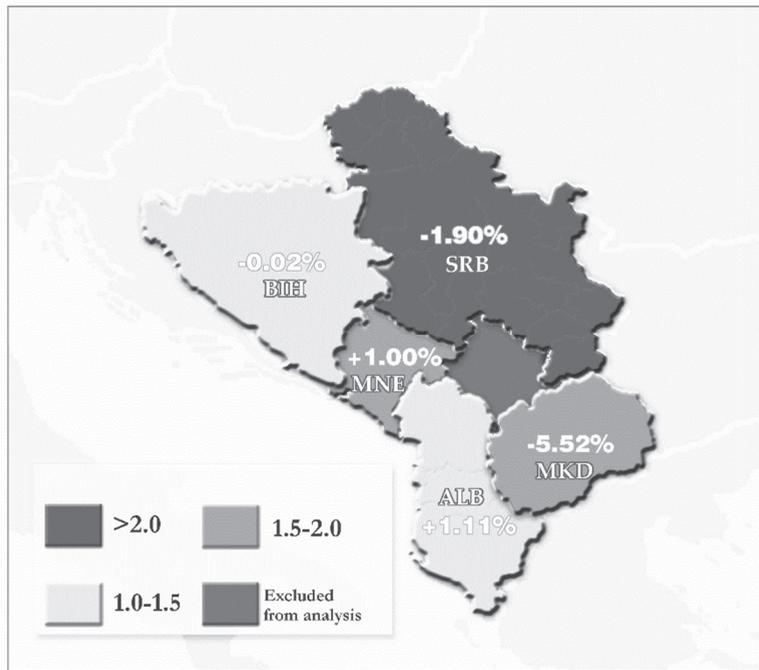
**Source:** The authors' calculations on the basis of the UN Comtrade Database, 2021

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 language differences and historical circumstances affecting trade. The ability of

populations to communicate directly is namely a factor that influences the formation of foreign exchange between economies (Trivić & Klimczak. 2015). Regarding the commodity structure of exports from Western Balkan countries, products from the section 'food and live animals' dominate (Matkovski et al., 2022). According to this research, there are differences between countries, and the subcategory of vegetables and fruit is significant in the structure of exports in a large number of countries. For example, in Serbia, vegetables and fruit, along with cereals and cereal preparation, make up 47% of exports. For North Macedonia, the export of tobacco and tobacco manufactures is important, while for Montenegro, an important item of export is beverages.

Analysing the index of revealed comparative advantages, it can be noticed that in the analysed period, on average, all the 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 is recorded for most of the years, but there is a slight increase at an average annual rate of 1.1%. In addition to Albania, Bosnia and Herzegovina has 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 the improving competitiveness required by the world market in regional and international integration and relatively poorer export performances (Matkovski et al., 2016). Additionally, previous research (Matkovski et al., 2022) showed that, although the section 'food and live animals' is dominant in the export of all Western Balkan countries, the comparative advantages of this section are achieved only by Serbia. Serbia gains the most significant comparative advantages in the export of cereals and cereal preparations and fruit and vegetables. North Macedonia also achieves a high level of comparative advantages in the export of cereals and cereal preparations, and also in the export of tobacco and tobacco manufactures.

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

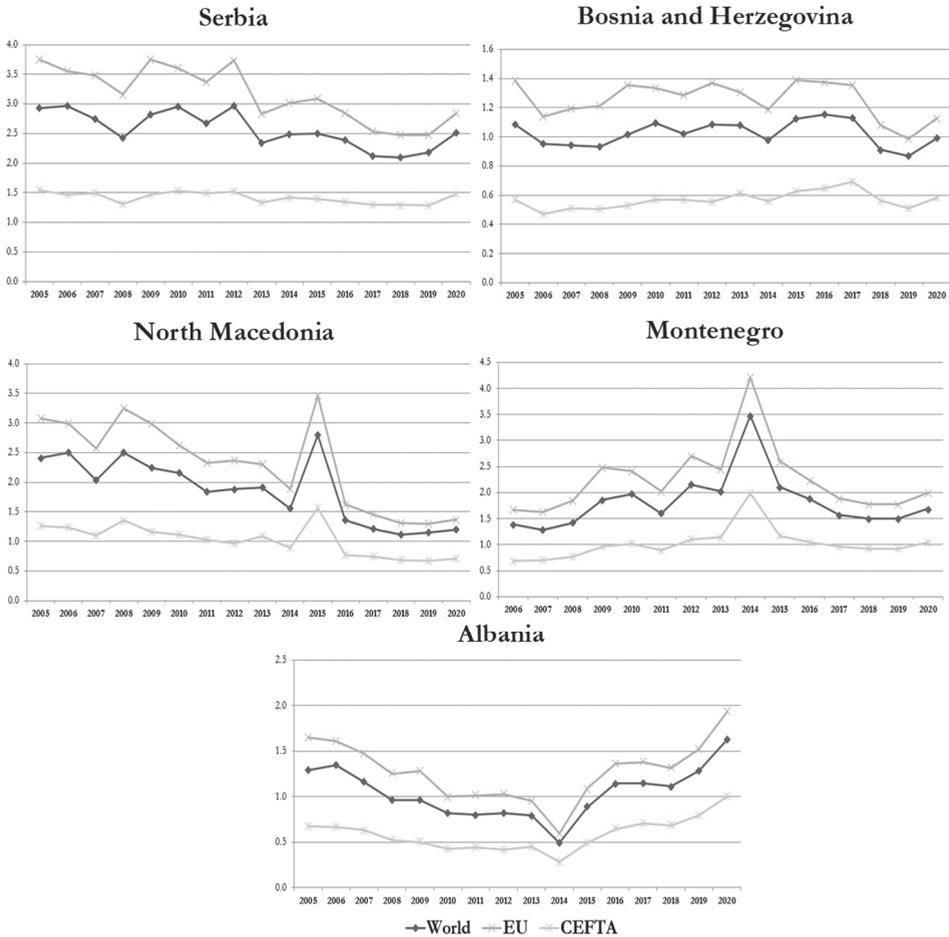


**Source:** The authors' calculations on the basis of the UN Comtrade Database, 2021

*Note:* SRB – Serbia; BIH – Bosnia and Herzegovina; MNE – Montenegro; ALB – Albania; MKD – North Macedonia.

Considering the differences in comparative advantages in the export of agri-food products by individual country (Figure 4), it can be concluded that all the Western Balkan economies have a high level of comparative advantages in the export of these products to the EU market. Serbia has strong comparative advantages, North Macedonia and Montenegro have significant comparative advantages, while the comparative advantages in the export of agri-food products from Bosnia and Herzegovina and Albania are revealed to be at a satisfactory level. Bearing in mind the method of calculation of RCA, it is quite logical that comparative advantages are realised at a higher level on the EU market, given that the share of agri-food exports to the EU is higher than the share of exports of these products in the CEFTA countries in total.

**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 two latter economies, bearing in mind the method of calculating the index of revealed

comparative advantages, should be sought not only 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 due to 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 the 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, with the Breusch-Pagan test being used to analyse whether the ordinary least square method (OLS) or RE model was more suitable. The results of the Breusch-Pagan test showed that RE is preferred (Table 2).

The next step in the selection process was the choice between the fixed effects (FE) and RE models using the Hausman test. The results of the Hausman test showed that FE is 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 show the presence of autocorrelation, since the test value is lower than the lower critical value (Table 2).

**Table 2.** Estimation of the gravity model of export of agri-food products in the Western Balkans using OLS, FE, and RE models

| Variable        | Dependent Variable: $X_{ijt}$ |            |             |         |
|-----------------|-------------------------------|------------|-------------|---------|
|                 | 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  |
| $CEFTA_{ijt}$                 | 0.0401595          | 0.176272           | 0.2278      | 0.8198  |
| $SAA_{ijt}$                   | 0.461989           | 0.0826077          | 5.5926      | <0.0001 |
| 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               |                    |                  |         |

Note:  $X_{ijt}$  - export of agri-food products;  $Y_{jt}$  - GDP of the importer;  $Y_{jt}/L_{jt}$  GDP per capita of the importer;  $D_{ij}$  - distance;  $B_{ij}$  - shared border;  $CEFTA_{ijt}$  - effects of CEFTA;  $SAA_{ijt}$  - effects of Stabilisation and Association Agreement (SAA).

Source: The authors' calculations.

In order to eliminate the problem of inefficient estimation of regression parameters in the presence of autocorrelation in the FE model, and to control for the zero-trade observations and the bias of the OLS coefficients in the presence of the heteroscedasticity, the gravity model of exports of agri-food products was estimated with the Poisson pseudo maximum likelihood (PPML) method (Silva & Tenreyro, 2006). Additional research by Santos-Silva and Tenreyro (2010) showed that PPML is generally well behaved, even when the proportion of zeros in the sample is very large. Following the guide of Yotov et al. (2016), who concluded that PPML is a very attractive choice for this type of modelling, we present the results of our estimation in Table 3.

The results of estimating the gravity model of exports of agri-food products from the Western Balkans using PPML indicate that the impact of demand factors on exports of these products is significant and positive, as shown by a positive sum of the coefficient of elasticity  $Y_{jt}$  and  $Y_{jt}/L_{jt}$  as an approximation of demand. The results show that with the unchanged level of other factors, a one per cent increase in demand leads to an increase in exports of agri-food products from the Western Balkans of an average of 0.03% ( $\beta_1 + \beta_2$ ). 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 significantly and positively impacts exporting agri-food products.

**Table 3.** Estimation of the gravity model of export of agri-food products in Western Balkans using the PPML model

| Variable           | Dependent Variable: $X_{ijt}$<br>Poisson Pseudo Maximum Likelihood (PPML) |                       |        |            |
|--------------------|---|-----------------------|--------|------------|
|                    | Coefficient   | Std. Error            | z      | P>z        |
| Constant           | 2.330152  | 0.0748847             | 31.12  | <0.0001    |
| $Y_{jt}$           | 0.0548954   | 0.0031151             | 17.62  | <0.0001    |
| $Y_{jt}/L_{jt}$    | -0.0216491  | 0.0065165             | -3.32  | 0.001      |
| $D_{ij}$           | -0.1291506  | 0.0085491             | -15.11 | <0.0001    |
| $B_{ij}$           | 0.1209605   | 0.0103676             | 11.67  | <0.0001    |
| CEFTA $_{ijt}$     | 0.0590485   | 0.0119684             | 4.93   | <0.0001    |
| SAA $_{ijt}$       | 0.0100566   | 0.0084705             | 1.19   | 0.235      |
| R-squared          | 0.31546813  | Pseudo log-likelihood |        | -6268.2651 |
| Total observations |   | 2,501                 |        |            |

Note:  $X_{ijt}$  – export of agri-food products;  $Y_{jt}$  – GDP of the importer;  $Y_{jt}/L_{jt}$  GDP per capita of the importer;  $D_{ij}$  – distance;  $B_{ij}$  – shared border; CEFTA $_{ijt}$  – effects of CEFTA; SAA $_{ijt}$  – effects of Stabilisation and Association Agreement (SAA).

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 PPML model show that only CEFTA 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 6.08%. This result is expected, bearing in mind that in the analysed period there was a liberalisation 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

When it comes to the comparative advantages of the agri-food sector, the results of this research are in line with previous research on these topics. The results clearly indicate that Serbia achieves the best results, while Albania the worst (Matkovski et al., 2016; Matkovski et al., 2019). As far as econometric modelling using the gravity model is concerned, previous research also indicates a significant and positive effect of the CEFTA agreement on export flows of agri-food products (Dragutinović-Mitrović & Popović-Petrović, 2013, Matkovski et al., 2018a, Matkovski et al., 2018b). However, given the importance of agriculture and especially the agri-food sector for all the aforementioned economies of the CEFTA region, the current level of competitiveness at the overall regional level implies there is an need to improve this competitiveness (Birovljev et al., 2017). All of these economies face difficult situations because of the external pressures coming mainly from the EU. In order to improve competitiveness, productivity improvement is needed and recommended, as agricultural performance in the Western Balkans is at a lower level (Marcikić Horvat et al., 2020).

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

**Bosnia and Herzegovina** has relatively low export performance 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 a positive impact on intra-industry agri-food trade between Bosnia and Herzegovina and the economies of the CEFTA region in the period 2008-2018. These variables are the size of the

economies measured by GDP, ethnic origin and similarities, territorial borders between economies, and economic integration realised with trade liberalisation. 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 the CEFTA region were identified after the accession of Croatia to the EU, and these were mostly noticed in the structure and geographical orientation of foreign trade of Bosnia and Herzegovina towards CEFTA economies with the markedly lesser importance of this region for its foreign trade (Brkić & Sušić, 2019).

The position of **North Macedonia** in the foreign trade of agri-food products with the CEFTA region was estimated as positive because of trade liberalisation, but still with a great dependency on imports with the accompanying foreign trade deficit in agricultural products. The causes for this can be found in insufficient competitiveness, problems with amounts of food produced, and low levels of production and export of products with more added value (Mojsovska, 2019), which is characteristic of production and industry for all the Western Balkan economies.

Exports of agri-food products from **Montenegro** are modest, given the low production potential, thus export levels 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 the largest compared to other CEFTA economies, leading to Montenegro's most unfavourable position among all these economies (Jovanović et al., 2015). Low productivity and neglected agriculture with abandonment of rural areas are the main reasons for the lack of comparative advantages in agri-food exports, but of more concern is the continuing high level of import dependency (Fabris & Pejović, 2012) mostly on the CEFTA region and EU. As a result, Montenegro's export trade is mainly oriented towards the CEFTA region, but of small value (Zekić & Matkovski, 2019).

As an economy with great agricultural potential, **Albania** has not made use of its opportunities to improve its export of agricultural products to CEFTA economies (although a delayed reaction that will improve its position is expected), but its level of exports remained constant after its original growth as a result of accession to the free trade arrangement. The main reasons behind this slower growth of

exports are the still existing administrative barriers, customs and other procedures and measures (Braha et al., 2017). Nevertheless, the importance of CEFTA to Albania as the former most isolated country in Europe cannot be neglected and this can be confirmed by the results that showed the positive effects on Albanian trade as a whole with the CEFTA region that was possible because of less protectionism in comparison to the years prior to CEFTA (Choi & Minondo, 2019).

There are a few threats to 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 political and economic crises. According to Bieber et al. (2020), greater regional cooperation is necessary to prevent new polarisation and tensions, and the EU should include the region in planning for post-COVID-19 reconstruction. Also, as Crescenzi et al. (2020) pointed out, increasing scepticism of individual EU member states about any future progress in the process of economic and political integration has emerged. Indeed, some economies insist on greater policy autonomy, and sometimes they also challenge the core values of the EU (for example, the critique of liberal democracy in Hungary and questioning centrally imposed fiscal constraints in Italy). Additionally, the migrant crisis has caused a rise in nationalism throughout the EU, especially in border states. In the face of all these crises, regional cooperation and coordination will be especially important in preventing new polarisation and tensions.

However, this research has some **limitations**. Limitations connected with using the RCA index are problems of its utility in comparative studies because it only shows the relative position of economies. At the same time, it is considered a good indicator of the comparative advantages of commodities. Furthermore, it has been highlighted that this index tends to address biased comparative advantages that are found. Owing to these limitations, results can often be inconsistent, especially for economies with a smaller share of exports on the global market. In addition, it is not easy to include all factors in the process of econometric estimation using the gravity model, so the model includes only the most significant factors that affect the export of agri-food products in the Western Balkans. Due to the problem of quantification, indicators that represent potential

trade barriers in agri-food chains are not included in the estimated model. Previous research has shown that these barriers are significant in cross-border regional trade within CEFTA (Krasniqi et al., 2019). Some authors have also argued that free trade agreements are endogenous (Baier et al., 2014). Therefore, this specification will be used in our future research in order to find more unbiased effects of CEFTA and other agreements on trade in agri-food products in the Western Balkans.

## **6. CONCLUSIONS**

An intensification of the foreign trade in agri-food products and a partial change in the orientation of this trade is observed in all the economies of the Western Balkans, with an increase in exports of agri-food products and the analysis of the geographical allocation of exports showing that most of these products go to EU economies, followed by CEFTA economies. Considering the comparative advantages of agri-food products in the Western Balkan economies, it can be noticed that all the 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 liberalisation 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 in exports with changing demand, a significant and negative impact of distance between economies, and a significant and positive impact of shared state borders 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 econometric research results clearly indicate this impact of the CEFTA on the intensification of exports of agri-food products. This is not surprising. 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. Moreover, the Western Balkan 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 here is easier 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. For this reason, efforts in the economies of the Western Balkans must be directed not only towards the integration of the producers themselves, but also towards the fulfilment of the required standards of 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 liberalisation with the EU market.

Through successful testing of the main research hypothesis, the results indicate that CEFTA integration processes affect the export of agri-food products in the Western Balkans the most, and the hypotheses were confirmed. Namely, the research clearly showed that the liberalisation 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. Furthermore, the gravity model results indicate that CEFTA statistically significantly influenced the export of agri-food products in the Western Balkans.

The research results have certain **practical implications** for trade agreements for the export of agri-food products and changes in the level of comparative advantages, which is important for both macroeconomic and microeconomic aspects. Given that liberalisation 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. That support should go in the direction of adapting to the current support within the Common Agricultural Policy of the EU, and when it comes to foreign trade measures, the rules of the World Trade Organization should be respected. **Future research** can be directed toward 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.

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