
COMPETITIVENESS OF AGRI-FOOD EXPORTS OF THE REPUBLIC OF SERBIA IN THE COVID-19 CONDITIONS

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ARTICLE INFO

Review Article

Received: 24 November 2021

Accepted: 02 March 2022

doi: 10.5937/ekoPolj2201227M

UDC 339.564:[616-036.21:578.834(497.11)]

Keywords:

exports, agri-food sector, competitiveness, Republic of Serbia, pandemic

JEL: Q17, Q18, F14

ABSTRACT

The research aims to determine the intensity and direction of the impact of the global health and economic crisis from 2020 on the export competitiveness of the agri-food sector of the Republic of Serbia. Empirical study shows that there was an increase in the importance of exports of agri-food products in the crisis year 2020 according to all analysed indicators (net exports index, index of contribution to trade balance, relative coverage of imports by exports, unit values of exports). This confirms the hypothesis that this sector has exceptional resilience to crisis events. Moreover, net exports of these products increased significantly in 2020 compared to 2019 as a pre-crisis year. Therefore, the agri-food sector of the Republic of Serbia plays an important role in periods of such a crisis caused by non-economic factors, because it can compensate for the decline in exports and gross value added of other sectors.

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Introduction

The global health and economic crisis caused by the COVID-19 has affected almost all sectors of the economy. The crisis of a non-economic nature quickly spread to the economic sphere (Cvijanović & Pantić, 2021). Economic disruptions were inevitable due to government efforts to curb the spread of the virus to protect the population health (Kerr, 2021). Travel restrictions caused difficult movement of goods, an increase in stocks in companies' warehouses due to problems in supply chains, but also a lack of manpower (Kalogiannidis & Melfou, 2020). On the other hand, farmers engaged in

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the production of fresh fruits, vegetables and dairy products, at first suffered heavy losses due to logistical and transport difficulties (Štreimikienė et al., 2021). All this has affected the reduction of exports and production due to the difficult import of inputs needed for food production (seeds, pesticides, agricultural machinery). Labour shortages and declining imports in import-oriented countries have resulted in a significant decline in the agricultural sector, as a typical labour-intensive sector. Due to the need to enhance immunity, there has been a change in the demand. In addition, larger purchases and the creation of stocks are noticeable, which has led to an increase in the demand for agri-food products.

At the macro level, the restriction of socio-economic activities has led to a deterioration in national accounts, as many sectors have collapsed. The negative impact is especially noted on the tourism, air transport and foreign trade sectors (Rueda Cantuche, 2021). As the link between exports and economic growth is two-way (Syamni, 2021), countries with a high share of tourism, as well as some industrialized countries, have faced negative growth rates. On the other hand, the Republic of Serbia in 2020 achieved a decline in gross domestic product of only 1.1%, which is one of the better results given the European countries (Savić et al., 2021). This is the result of a well-conducted macroeconomic policy, timely and effective measures to overcome the consequences of the crisis, but also above-average results in certain sectors of the economy. The ICT industry stands out in particular, as well as the agri-food sector, as part of the real sector of the Serbian economy.

The agri-food sector of the Republic of Serbia has a high share in total exports, employment and gross value added. Since it is a traditional export-oriented sector (with significant net exports), it can meet all the needs of the population and place a certain “surplus” abroad. Therefore, improving the balance of payments is one of the most important roles of this sector. As the agri-food sector is considered one of the most unpredictable sectors (Jámbor, Czine & Balogh, 2020), it is essential to investigate the effects of the COVID-19 pandemic on food prices, demand, supply, but also the macroeconomic consequences on exports, imports, and the competitiveness of the same.

In the period before the crisis, the Republic of Serbia achieved good results when it comes to the competitiveness of agriculture and the food industry. In times of crisis, the challenge is to achieve food security of the population and to realize adequate foreign exchange inflows based on exports. The objective of this paper is to review and compare the importance and competitiveness of exports before and during a pandemic. For that purpose, the index of net exports, the index of contributions to the trade balance, as well as the relative coverage of imports by exports were used. An additional goal is to analyse the movement of unit values of exports of this sector in regular circumstances (2019) and in the midst of the crisis caused by the COVID-19 at the end of 2020, in order to explore the effects from the point of view of price competitiveness factors. The chances of Serbian agriculture in the period of the current pandemic are summarized in the Conclusion, as the last part of the paper.

Materials and methods

The agri-food sector includes the following divisions classified according to the methodology of the Statistical Office of the Republic of Serbia (2019) and according to the SITC (revision 4), marked with two-digit numbers: 00 - Live animals other than animals of division 03; 01 - Meat and meat preparations; 02 - Dairy products and birds eggs; 03 - Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates; preparations thereof; 04 - Cereals and cereal preparations; 05 - Vegetables and fruit; 06 - Sugar, sugar preparations and honey; 07 - Coffee, tea, cocoa, spices, and manufactures thereof; 08 - Feeding stuff for animals (not including unmilled cereals); 09 - Miscellaneous edible products and preparations; 11 - Beverages; 12 - Tobacco and tobacco manufactures; 21 - Hides, skins and furskins, raw; 22 - Oil-seeds and oleaginous fruits; 29 - Crude animal and vegetable materials, not elsewhere specified; 41 - Animal oils and fats; 42 - Fixed vegetable fats and oils, crude, refined or fractionated; 43 - Animal or vegetable fats and oils, processed; waxes of animal or vegetable origin.

The research within this study covers a fourteen-year period, more precisely from 2007 to 2020. The main source of empirical data is the database of the Statistical Office of the Republic of Serbia. The study will try to answer the research question: did the importance and competitiveness of agri-food exports of Serbia decrease in the period of COVID-19?

Indicators of the importance of agri-food exports for total foreign trade may be different. The value of exports, the value of net exports, as well as the share of exports of the agri-food sector in total exports of the economy and world exports, can be the starting measures in the analysis and assessment of competitiveness. The main indicators of the importance of total and sectoral exports present in the literature and which will be applied in the forthcoming analysis are:

- (i) net export index (NEI),
- (ii) index of the contribution of the external trade of a sector to the trade balance of goods (or shorter, contribution to the trade balance of goods) (CTB) and
- (iii) relative coverage (RC) of imports by exports.

These are relative indicators that more comprehensively reflect the competitiveness of exports and are used when it comes to analysing the role of partial segments of the economy.

The first in a series of measures of export competitiveness that will be calculated and monitored is the NEI. This is a typical indicator that is used in the analysis of the external competitiveness of the entire economy or its parts. The term relative foreign trade balance or net trade index is also used in the literature (Marković, Krstić & Radenović, 2019), and shows the revealed comparative advantages (RCA index) (Marjanović & Marjanović, 2019). Unlike a simple indicator of import-export coverage, this one includes the entire external trade exchange of the analysed sector. The index is calculated simply, as the quotient of the difference and the sum of the values of exports and imports of a certain group of products, in this case the agri-food sector, using the following formula (Bozduman & Erkan, 2019; Marković, 2019; Božić, Nikolić & Božić, 2021):

$$NEI = \frac{x_{ij} - m_{ij}}{x_{ij} + m_{ij}} \quad (1)$$

where:

NEI – index of net exports of the agri-food sector,

x_{ij} – value of exports of the agri-food sector *i* of the country *j*,

m_{ij} – value of imports of the agri-food sector *i* of the country *j*.

The logic of this indicator is such that its growth indicates that there has been an increase in net exports of the sector compared to the sum of sectoral exports and imports. To enhance the competitiveness of exports, it is necessary that (in addition to the absolute growth of net exports) the value of exports grows in a higher percentage than the increase in imports of the agri-food sector.

In contrast to the presented index, the CTB index measures the importance of the sector's exports in relation to the total external trade balance of the economy. The index is obtained by the following formula: (Melišek, 2012; Jovović & Jovović, 2018; Marković, 2019; Marković & Marjanović, 2021):

$$CTB = \left(\frac{x_{ij} - m_{ij}}{X_j + M_j} - \frac{X_j - M_j}{X_j + M_j} * \frac{x_j + m_j}{X_j + M_j} \right) * 100 \quad (2)$$

where:

CTB – index of contribution of the agri-food sector to the (external) trade balance of goods,

x_{ij} – value of exports of the agri-food sector *i* of the country *j*,

m_{ij} – value of imports of the agri-food sector *i* of the country *j*.

X_j – value of goods exports of all sectors *i* of the country *j*,

M_j – value of goods imports of all sectors *i* of the country *j*.

A higher value of this index implies a greater importance of the sector in the external trade balance of goods (Marković & Marjanović, 2021).

The next indicator, as well as the previous one, measures the internal competitiveness of agri-food exports. In fact, it is the RC of imports by exports of the agri-food sector in relation to the entire economy. The coefficient of RC of imports by exports is calculated as follows (Kersan-Škabić, 1999; Milanović, Stevanović & Vićentijević, 2013; Marković & Marjanović, 2021):

$$RC_{ij} = \frac{\frac{x_{ij}^t}{m_{ij}^t}}{\frac{\sum_{i=1}^n x_{ij}^t}{\sum_{i=1}^n m_{ij}^t}} \quad (3)$$

where:

RC_{ij} - coefficient of relative coverage of imports by exports of the agri-food sector,

x_{ij} – exports of agri-food sector i of the country j ,

m_{ij} – imports of agri-food sector i of the country j ,

$\sum_{i=1}^n x_{ij}^t$ – total exports of all sectors i of the country j ,

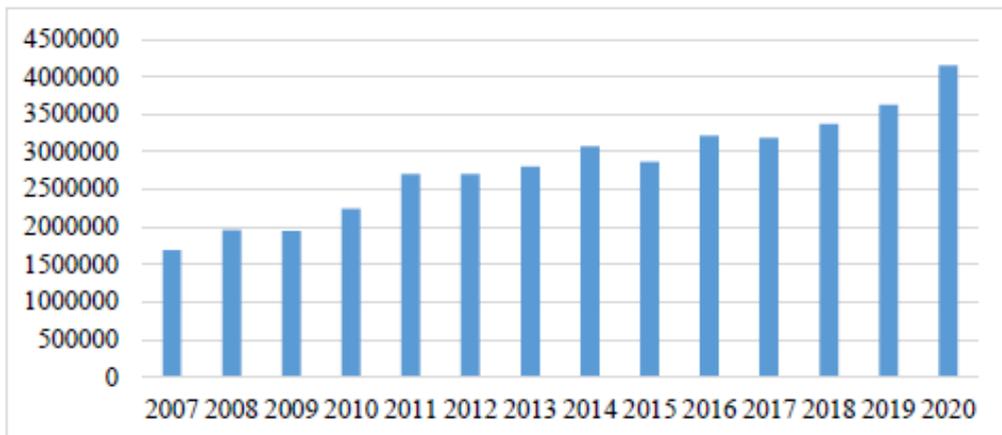
$\sum_{i=1}^n m_{ij}^t$ – total imports of all sectors i of the country j .

The higher importance of agri-food exports in the total economy will be in the case that exports increase or imports of this sector fall, and will further increase if the deficit of the total external trade balance of goods deepens.

Results and Discussions

At the very beginning of the analysis, it is interesting to see whether there was an increase or decrease in exports of the agri-food sector of the Republic of Serbia in 2020. The results show that in the period of the pandemic, an enormous growth of exports of the agri-food sector of as much as 14.4% was recorded, so that the value of exports at the end of 2020 exceeded USD 4 billion (Figure 1). Starting in 2012, this is the highest annual growth rate of the value of exports of this sector. Also, for comparison, the average growth of the agri-food exports was about 7% in the analysed period.

Figure 1. Evolution of the value of exports of the Serbian agri-food sector (thousands of USD)

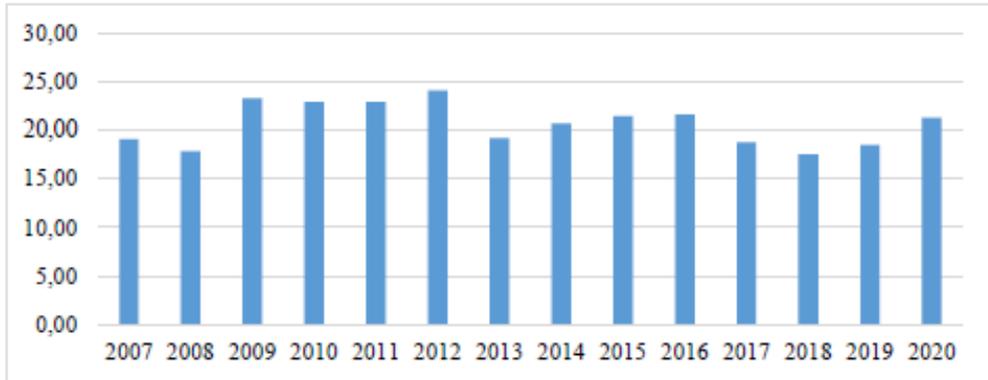


Source: Authors' presentation according to the data of the Statistical Office of the Republic of Serbia, 2021.

As absolute values in economic research often have less analytical significance, the share of agri-food sector in the total exports of the Republic of Serbia for the same period was also considered. The data in Figure 2 show that this share increased in the

crisis year 2020, and again amounted to over 20% (after several years of stagnation). The importance of agri-food exports in the Serbian economy has obviously increased during the pandemic, unlike the economic crisis of 2008, which had a negative impact on its exports.

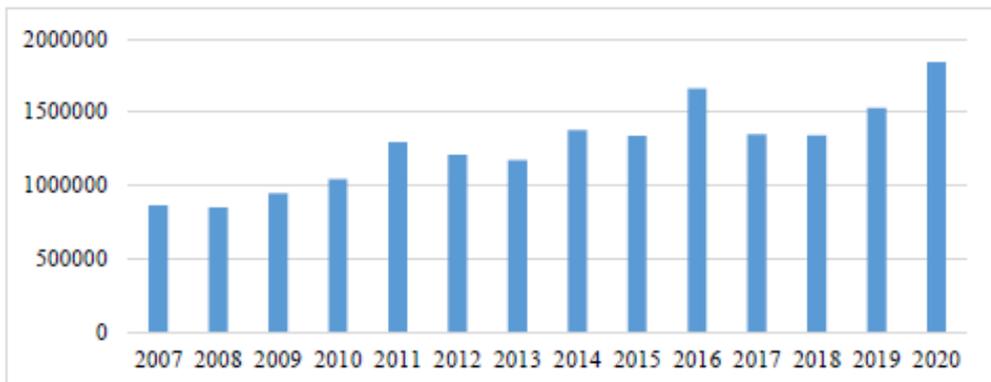
Figure 2. Share of the agri-food exports in the total exports of the Republic of Serbia (%)



Source: Authors' calculation according to the data of the Statistical Office of the Republic of Serbia, 2021.

On the way to relative indicators of importance and competitiveness of exports, it remains to see the value of net exports of the analysed sector. Net exports of the agri-food sector were at their peak in the year of the COVID-19 pandemic, amounting to over USD 1.84 billion at the end of 2020 (Figure 3).

Figure 3. Value of net exports of the Serbian agri-food sector (in thousands of USD)

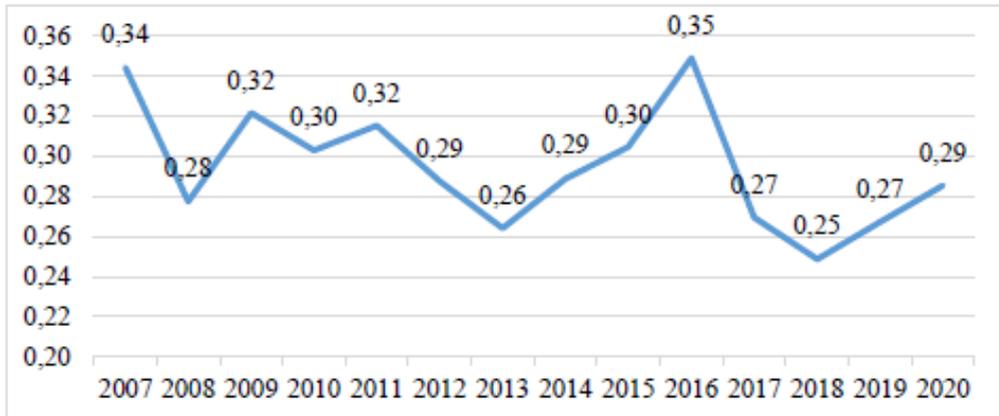


Source: Authors' calculation according to the data of the Statistical Office of the Republic of Serbia, 2021.

Compared to 2019, net exports of this sector increased by over 20%. So, in addition to the increase in exports, there has been a significant growth in net exports, which shows that the agri-food sector of the Republic of Serbia belongs to the leading export-oriented activities even in times of crisis of this type.

Figure 4 aims to present the first indicator of the importance of exports described in the research methodology. The results show that the NEI of the agri-food sector of the Republic of Serbia also increased in 2020, which is logical given the movement of the previously analysed absolute indicators. Regardless of the growth of imports, the growth of exports was high and enabled the growth of the NEI value, in contrast to the purely economic crisis from 2008, when there was a sharp decline in this indicator.

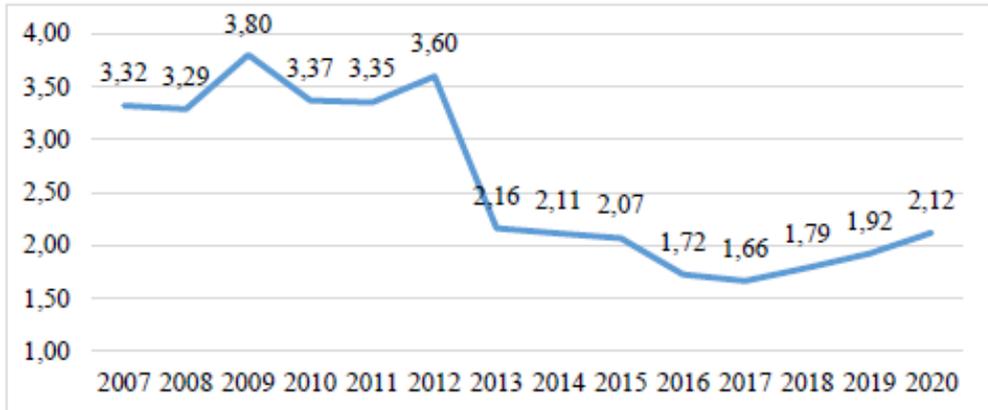
Figure 4. NEI of the agri-food sector of the Republic of Serbia



Source: Authors' calculation according to the data of the Statistical Office of the Republic of Serbia, 2021.

The following two Figures describe the importance of the agri-food sector in total external trade in goods. The movement of the CTB index values is the subject of Figure 5. Since 2013, there has been a significant decline in the value of this index. This is because the total external trade in goods of the Republic of Serbia grew much faster, so that the relative importance of net exports of agriculture and the food industry in that sense has decreased. In fact, the relative importance of external trade in agri-food products decreased in relation to other sectors in the trade balance (until 2017) due to the relative reduction of the share of exports in relation to the entire external trade of the Republic of Serbia. However, in addition to that, in 2020, the CTB index of agri-food exports to the trade balance increased, thanks to the good export results of the respective sector in a pandemic.

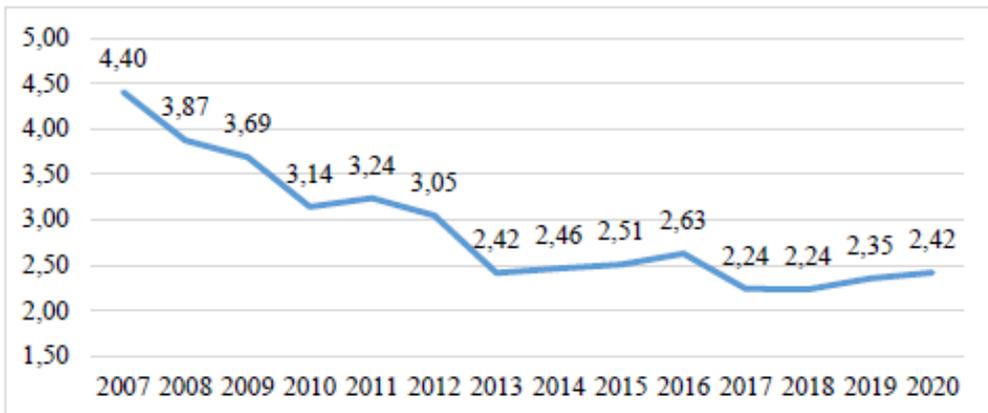
Figure 5. CTB index of the agri-food sector of the Republic of Serbia



Source: Authors' calculation according to the data of the Statistical Office of the Republic of Serbia, 2021.

The coefficient of RC of imports by exports of the agri-food sector from 2013 shows a declining importance of this sector in the overall economy (until the outbreak of the pandemic). This is a normal consequence of the structural transformation of a developing country in which industrial high-tech products get a larger share in external trade. More precisely, there was a stronger reduction in the deficit of the overall balance in relation to the coverage of imports by exports of the agri-food sector. However, in 2020, this coefficient will also enhance due to significantly weaker achieved results of other sectors of the Serbian economy and an increase in the external trade deficit of agriculture and the food industry. The rest of the trends can be seen by a detailed review of Figure 6.

Figure 6. Coefficient of RC of imports by exports of the Serbian agri-food sector



Source: Authors' calculation according to the data of the Statistical Office of the Republic of Serbia, 2021.

Based on all analysed indicators, the growth of the importance of Serbian exports of agri-food products during the pandemic period is evident. However, it is important to

determine whether this is the result of increased export quantity, or whether rising food prices played a decisive role.

The fact is that food prices are very unstable, significantly sensitive to shocks and have an unpredictable trajectory during the crisis. The COVID-19 pandemic conditioned the rise in prices because it reduced the supply of food and at the same time raised the demand. Due to the panic on the market, there was an excessive purchase of food products, while the weaker supply was due to the lack of workers who were engaged in harvesting crops, as well as the transport of goods (Daglis, Konstantakis & Michaelides, 2020). Therefore, these effects are examined in Table 1 and Table 2. In doing so, all 4 parts of agri-food exports were analysed separately: Food and live animals, Beverages and tobacco, Crude materials and Animal and vegetable oils, fats and waxes.

The Tables 1 and 2 show the unit values of exports and imports of the analysed sector in 2019 and 2020. They are obtained by simple calculation; the value of exports/imports is put in relation to the amount of exports/imports. Based on the calculated data, an increase in unit prices was observed in two sectors, and it was most pronounced in the sector with the highest added and market value - Beverages and tobacco. In this sub-sector, the unit values of imports are higher by over 30% in 2020. Therefore, despite the decline in export volumes, there was an increase in the total value of exports of these products. The authors believe that this is a consequence of higher demand for these products on a global level during this type of crisis events, which has raised prices on the world market. The situation was similar in the sector that includes Animal and vegetable oils and fats.

Table 1. Unit values of exports and imports of sectors belonging to agri-food products in 2019 (in thousands of USD per ton)

Sector	Total, USD thousand	Quantity, tonnes	Unit export values
Food and live animals	2583896,2	5545367,7	0,47
Beverages and tobacco	582500,4	599280,5	0,97
Part of the Sector Crude materials*	235978	425084,6	0,55
Animal and vegetable oils, fats and waxes	222231,1	299605,5	0,74

Source: Authors' calculation according to the data of the Statistical Office of the Republic of Serbia, 2021.

Note: (*) only divisions 21, 22 and 29 of the Crude materials sector belong to the agri-food products

Table 2. Unit values of exports and imports of sectors belonging to agri-food products in 2020 (in thousands of USD per ton)

Sector	Total, USD thousand	Quantity, tonnes	Unit export values
Food and live animals	2945956,0	6179824,5	0,48
Beverages and tobacco	689752,8	539953,4	1,28
Part of the Sector Crude materials	291553,1	522159,9	0,56
Animal and vegetable oils, fats and waxes	222092,3	259009,4	0,86

Source: Authors' calculation according to the data of the Statistical Office of the Republic of Serbia, 2021.

As there has been an increase in unit values of exports of beverages, tobacco and animal and vegetable fats, agricultural policymakers should keep this in mind when deciding on stimulative measures, because these parts of agri-food exports can radically improve the structure and value of exports during the crisis. As these are also products with the highest added value, special attention in further strategies of agricultural development must be directed towards them. It is imperative to get the maximum results in crisis periods in order to compensate for the bad economic results in other sectors of the Serbian economy, which obviously did not show resistance to the crisis caused by the non-economic cause.

In periods of crisis, there is a noticeable increase in the price of basic agricultural products, which can be useful for the future improvement in the value of exports and the reduction of the chronic deficit of the balance of payments of the Republic of Serbia. In addition, it turned out that in these conditions, thanks to agriculture and the ICT sector, there was a smaller decline in economic growth compared to the European average. This is because the demand for food (basic foodstuffs) is, by definition, quite inelastic (Elleby et al., 2020).

Conclusions

The aim of the paper was to investigate the consequences of the COVID-19 pandemic on the export and competitiveness of the Republic of Serbia's agri-food sector and at the same time prove the benefits and possibilities of this sector for the Serbian economy in the current crisis period. Specific indicators of external (index of net exports and unit value of exports) and internal competitiveness of exports (index of contribution to the trade balance and relative coverage of imports by exports) were used to assess the place and importance of agri-food exports in total foreign trade in goods.

The fact is that the agri-food sector has significantly improved its macroeconomic accounts. Exports increased, the value of net exports increased drastically, as did the share in total exports of the Republic of Serbia. In addition, progress has been made when it comes to growing the net export index and improving the competitiveness of this sector in foreign markets.

The research covered a longer period of time, in order to compare the effects of the present crisis due to the coronavirus pandemic with the impact of the global and

financial crisis from 2008. In contrast to that crisis of a purely economic character, completely different movements of almost all applied indicators were determined. Undoubtedly, structural transformations in the economy reduce the relative importance of agriculture and the food industry in the Serbian economy (Marković, Milanović & Marjanović, 2019). However, the COVID-19 pandemic has raised again the question of the importance of this sector, both from the point of view of ensuring national food security and internal competitiveness. Serbian agriculture and the food industry have obviously withstood the crisis, recorded an increase in competitiveness in the foreign market. Their impact was reflected in a reduction in the trade and balance of payments deficit, as well as a substantial increase in exports.

Almost all values of the indices applied in the research show that the pandemic has increased the relative importance of the agri-food sector in the total external trade in goods. Despite the decline in the importance of this sector since 2012 in the overall economy as a result of structural changes in the growing economy, it is necessary to note that the agri-food sector since 2019 is growing again in total trade. On the one hand, the poor structure of exports is an unfavorable situation for the economy. However, in this situation, the crisis did not affect the agricultural sector, so that was the reason for the reduced impact of the pandemic negative trends on the economy.

The crisis period could be a chance for Serbian agriculture, as many countries have restricted exports to ensure national food security. Negative trends and declining economic activities were compensated by the good results in the agri-food sector. The challenge was to meet the rapidly increasing consumption from countries which are in possession of sufficient quantities of food supplies ready to export to foreign markets.

The authors recommend that economic policy makers must continuously improve the structure of production and exports of the agri-food sector, not only because of its significant role in times of crisis, but also because of the strengthening of the Republic of Serbia's economy in regular circumstances. However, livestock production will face a special challenge, given the time it takes to replenish food stocks, as well as the uncertain future business decisions of farmers (Beckman & Countryman, 2021).

Acknowledgements

The paper is a part of the research financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Agreements on the implementation and financing of scientific research in 2022; registration number 451-03-X/2022-XX/200371 and 451-03-X/2022-XX/200100).

Conflict of interests

The authors declare no conflict of interest.

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