COMPETITIVENESS OF THE AGRI-FOOD SECTOR OF SERBIA THROUGH THE PERSPECTIVE OF UNIT VALUES OF EXPORTS AND IMPORTS

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ABSTRACT

The paper aims to investigate the export competitiveness of the Serbian agricultural and food (agri-food) sector at the divisional level. The core of the methodological approach is the calculation of export unit values (EUV) and import unit values (IUV) using data from the Statistical Office of the Republic of Serbia (SORS). The paper looks at export values, unit values, net exports, and competitiveness factors of the agri-food divisions for 2023. The obtained values indicate that Vegetables and Fruits is the division that has the largest share in agri-food exports, shows excellent terms of trade, and belongs to the group (category) of rare divisions that achieve competitiveness with quality. The Tobacco division is another important chapter of the agri-food sector, which also achieves non-price competitiveness, has a positive terms of trade and significant net exports, which are very good circumstances in conditions of the necessary structural changes and sustainable export growth of the overall sector. These highly propulsive divisions show the greatest potential for development and increase in the degree of processing, so in the future they should be further supported by the measures of the agricultural policy of Serbia.

Introduction

The agricultural and food (agri-food) sector is the key to ensuring the food security of any nation. In addition, countries have (more or less) economic benefits, considering the continuous increase in the prices of these products on the global level. In developing countries, these benefits improve the trade balance. Furthermore, if we consider the two-way link between agriculture and ecology (environment), it can

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be pointed out that the agri-food sector has significant implications for sustainable socio-economic development.

The Republic of Serbia has very exceptional initial conditions and good production opportunities (including processing capacities) for the development of agriculture, so that with the interaction of other (additional) factors, this sector can achieve a long-term competitive advantage in the world market. When it comes to the necessity of reducing the balance of payments deficit, Serbia relies heavily on the agri-food exports. Therefore, it is essential to study the export competitiveness, export structure and terms of trade of this sector. The period from 2020 to 2023 was marked by many global upheavals, such as the health crisis, the economic and monetary crisis, and the conflict between Russia and Ukraine. All of these events have had an impact on the world economy and international trade (Pantović et al., 2023; Milenković et al., 2023). In such circumstances, there has been disruption in supply chains, a change in the way businesses operate, and a change in global demand. Hence, there is a justification and value of this research.

This research aims to identify the most important divisions in agri-food exports and determine their position from the point of view of achieved unit values, bearing in mind both the world trade and the largest foreign trade partners: the European Union and the members of the CEFTA agreement. According to the latest available data for 2023 (SORS, 2024), Serbia exports 46.79% of its agri-food products to the European Union, while it sells slightly less than 30% (29.13%) to CEFTA members. Competitiveness research is important both for the national economy and the agri-food sector itself, as well as for businesses (micro level) to identify opportunities for the placement of their products and, at the same time, increase their participation and influence in the international market (Lădaru et al., 2024).

Sharples and Milham (1990) define export competitiveness as the ability of a country to produce and sell products and services in a particular market at competitive prices compared to other countries (Paul & Dhiman, 2021). The competitiveness of exports depends on a wide range of factors that affect the economic position of a country: the level of domestic production, the level of domestic demand, production costs, labour productivity, product quality, exchange rate, economic and trade policy of the country, the built brand of the country and certain products, the level of innovation, international standards and certificates, etc. (Sharma, 1992). It relies mostly on productivity (which is determined by production costs), but also on non-price factors of competitiveness, among which stand out: the image and reputation of the country or company, the range and quality of products, and other factors that allow the country to compete in the international market regardless of price (Pantović et al., 2022; Verma, 2002).

To understand external competitiveness, products that belong to the tradable sector are particularly important, because they are placed abroad. Agri-food products are the typical tradable products of every country. Mizik (2021) highlights the following factors that most affect the competitiveness of the agri-food sector: the country's trade

policy, production efficiency, and the degree of sophistication of the product. A much broader definition points out that competitiveness in international trade is a measure of a country's advantage or disadvantage in selling its products on the international market (OECD, 2008, p. 87). As a result, the measurement of export competitiveness is a complex issue (Durand et al., 1992). That is why in the scientific community, export competitiveness is one of the leading issues that is approached in different ways. One of the perspectives is an analysis of the export unit values (EUV) and import unit values (IUV). This research addresses this and aims to remedy the scarcity of literature regarding this aspect of the study of competitiveness.

Analysis of export competitiveness through the perspective of IUV and EUV involves consideration of the relationship between price and quality (Aiginger, 1997). The authors will look at four categories of competitiveness, bearing in mind the two-way trade of agri-food products between the Republic of Serbia and the entire world, as well as the most important groups of countries to which it is exported. Simplified, the analysis is based on the foreign trade balance and import-export prices (Juhász & Wagner, 2013). An increase in unit values of products from a particular section may mean either an increase in prices at the level of the section or an increase in exports of more expensive products within the analysed section (Deaton, 1988; McKelvey, 2011), so that unit values cannot be fully used in analyses as a proxy for price. On the other hand, unit values can be a reflection of the quality of a product only if: (i) the EUV is higher than the IUV, and the quantity of exports is higher than the quantity of imports, or (ii) the EUV is lower than the IUV, and the quantity of exports is lower than the quantity of imports (Fischer, 2010). This indicates that there are non-price factors of the competitiveness that a particular sector or group of products has in the world market. Otherwise, the unit values may reflect high production costs.

The research is organized in the following way. The first section discusses the material used in the research, as well as the applied methodology. Then, the results of the research are presented in the form of tables, followed by a discussion related to the most important contribution of this study. The last section deals with the justification of the research and provides the most important conclusions of the paper.

Materials and methods

The calculation is based on SORS data for 2023, so the paper identifies the state of competitiveness of exports of agri-food divisions for the latest available period.

The basis for the empirical analysis consists of export data relating to the following sections (18) of the agri-food sector (Standard International Trade Classification/ SITC – Rev. 4 (United Nations, 2006):

00 - Live animals other than animals of division 03 (abbreviated division title in the text: Live animals),

01 - Meat and meat preparations (Meat),

02 - Dairy products and birds' eggs (Dairy products),

03 - Fish (not marine mammals), crustaceans, molluscs, and aquatic invertebrates (Fish),

04 - Cereals and cereal preparations (Cereals),

05 - Vegetables and fruit (Vegetables and fruit),

06 - Sugar, sugar preparations and honey (Sugar),

07 - Coffee, tea, cocoa, spices, and manufactures thereof (Coffee, tea, and cocoa),

08 - Feeding stuff for animals (not including unmilled cereals) (Feeding stuff for animals),

09 - Miscellaneous edible products and preparations,

11 - Beverages,

12 - Tobacco and tobacco manufactures (Tobacco),

21 - Hides, skins and furskins, raw (Hides),

22 - Oilseeds and oleaginous fruits,

29 - Crude animal and vegetable materials, not elsewhere specified (Crude materials),

41 - Animal oils and fats,

42 - Fixed vegetable fats and oils, crude, refined or fractionated (Fixed vegetable fats and oils),

43 - Animal or vegetable fats and oils, processed; waxes of animal or vegetable origin (Animal or vegetable fats and oils).

These are segments that are common, i.e. accepted as standard parts of the agricultural and food products of Serbia, based on previous literature dealing with agri-food trade and competitiveness (Matkovski et al., 2017; Marković et al., 2022; Matkovski et al., 2019). Bearing in mind the minor participation of Division 26, as well as the fact that it does not include only agri-food products, certain commodity groups from this division were excluded from the analysis due to the simplification of the tabular presentations (Verter et al., 2020). They are five commodity groups: Silk; Cotton; Jute and other textile bast fibres; Vegetable textile fibres; and Wool and other animal hair.

One of the main measures of the quality of agri-food products are the EUV and IUV (Dimitrijević et al., 2023). In addition to a measure of quality, unit values can indicate the degree of productivity and competitiveness (Aiginger, 1997). EUV are obtained by dividing export value by export volume (this can be at the level of sectors, divisions, commodity groups and products). On the other hand, the IUV are calculated by comparing the sum of the import values to the physical volume of imports (at the level of sectors, divisions, commodity groups or products, too).

Whether a particular division of the sector of agri-food products achieves export competitiveness and of what type, it can be determined by analysing the EUV and IUV (together with the observation of the quantities of exports and imports). This analysis is often used as an indicator of the reached price competitiveness, but also the existence of non-price aspects of competitiveness, which is determined based on the following relations (Marković et al., 2019; Mrdalj et al., 2022, Nikolić et al., 2023):

i) Pxij > Pmij Ù Qxij > Qmij Þ non-price competitiveness (competitiveness with quality),

ii) Pxij < Pmij Ù Qxij > Qmij Þ price competitiveness,

iii) Pxij > Pmij Ù Qxij < Qmij Þ price non-competitiveness, and

iv) Pxij < Pmij Ù Qxij < Qmij Þ non-price non-competitiveness (non-competitiveness in quality).

The first group consists of those divisions whose export quantity (Qxij) exceeds the volume of imports (Qmij) and whose EUV (Pxij) is higher than the IUV (Pmij). This category achieves competitiveness with quality. Products from this group, although more expensive than imported equivalents, achieve a higher volume of exports than imports, which shows the existence of certain non-price factors of competitiveness.

The second group of products also has a positive foreign trade balance (in quantities), which means that they are competitive on the global scene. However, the lower EUV than the IUV for the same division implies that these segments achieve price competitiveness.

The third segment is related to price non-competitiveness. A country (in exports of this category) achieves a lower volume of exports than imports, and as the EUV are higher, such divisions are not price competitive in a global or specific market.

The last category consists of divisions with a negative trade balance (bearing in mind the quantities) despite the lower EUV compared to the IUV. Judging by the previous mathematical relation, as expected, this segment includes divisions (products) that do not have satisfactory quality on average, so they are a mirror of non-competitiveness in quality.

Results

Table 1 offers a view of the export value of agricultural and food divisions in 2023, and their share in total exports of agriculture and food industry of Serbia. The data show that the Vegetables and Fruits are the most represented (22.25%), while Cereals are in second place in total exports (16.43%). Exports from these two divisions generate nearly USD 2 billion. According to data for 2023, exports from the agri-food sector of Serbia amounted to over USD 5 billion.

Table 1. Export values of agri-food divisions and their importance in exports of the analysed sector (2023)

Divisions	Export value (in thousands of dollars)	Participation in sectoral exports (in percentages)
00 Live animals	52,056	1.04%
01 Meat	109,585	2.19%
02 Dairy products	195,353	3.90%
03 Fish	15,710	0.31%
04 Cereals	823,461	16.43%
05 Vegetables and fruit	1,115,575	22.25%
06 Sugar	86,251	1.72%
07 Coffee, tea, and cocoa	214,044	4.27%
08 Feeding stuff for animals	429,489	8.57%
09 Miscellaneous edible products and preparations	357,623	7.13%
11 Beverages	506,711	10.11%
12 Tobacco	593,369	11.84%
21 Hides	12,248	0.24%
22 Oilseeds and oleaginous fruits	146,471	2.92%
29 Crude animal and vegetable materials	63,022	1.26%
41 Animal oils and fats	5,100	0.10%
42 Fixed vegetable fats and oils	278,122	5.55%
43 Animal or vegetable fats and oils	8,626	0.17%
Total agri-food export	**5,012,816**	**100%**

Source: Calculation of authors using the data of the SORS, 2024.

Table 2 provides an overview of the EUV and IUV of 18 divisions in the examined period. EUV are determined as the quotient of the export value to the quantity of exports, while the IUV represent the ratio of the value of imports to the import quantity. The highest EUV are of Fish (10.21) and Tobacco (9.95), while the highest IUV are noticed from the divisions of Tobacco (7.63), Live animals (5.08), and products from division 07 (tea, coffee, cocoa, etc.) (4.73). Cereals have the lowest EUV (0.38), while the lowest IUV for 2023 is recorded by the Oilseeds and oleaginous fruits division (0.89).

Table 2. EUV and IUV of the agri-food sector at the level of divisions (USD per tonne)

Divisions	EUV	IUV
00 Live animals	3.02	5.08
01 Meat	4.09	3.69
02 Dairy products	2.35	2.95
03 Fish	10.21	3.87
04 Cereals	0.38	2.45
05 Vegetables and fruit	1.86	1.24
06 Sugar	0.94	1.31
07 Coffee, tea, and cocoa	5.01	4.73
08 Feeding stuff for animals	0.73	1.20

Divisions	EUV	IUV
09 Miscellaneous edible products and preparations	2.94	3.38
11 Beverages	0.69	1.05
12 Tobacco	9.95	7.63
21 Hides	1.23	1.30
22 Oilseeds and oleaginous fruits	0.63	0.89
29 Crude animal and vegetable materials	2.05	2.70
41 Animal oils and fats	0.85	1.72
42 Fixed vegetable fats and oils	1.11	1.72
43 Animal or vegetable fats and oils	1.21	1.46

Source: Calculation of authors using the data of the SORS, 2024.

Table 3 aims to show the terms of trade (relative unit values), which in this sense will be calculated as the ratio of the EUV to the IUV of a particular division of the Serbian agri-food sector. Trade ratios are greater than 1 (positive terms of trade) if the EUV are higher than the IUV, and vice versa. The Republic of Serbia has by far the best terms of trade when it comes to the Fish division (2.64), while the worst terms of trade are recorded by the Cereals division (0.16). The improvement of the processing of products from the Cereals division is especially important due to the previous fact, as well as the highest value of net exports that this chapter achieves in relation to all others, which in 2023 amounted to over half a billion USD. Vegetables and fruits are also performing well with net exports of over USD 400 million. The Fish division would have to be further supported by agrarian and economic policy makers, given the excellent terms of trade. Of particular concern may be the large absolute decline in the net exports value of the Meat division, so in fact, the highest net imports in 2023 were present in this division (SORS, 2024).

Table 3. Terms of trade of agri-food sector divisions and the net export values

Divisions	Terms of trade	Net exports
00 Live animals	0.59	26,474
01 Meat	1.11	-207,818
02 Dairy products	0.80	-34,537
03 Fish	2.64	-132,309
04 Cereals	0.16	500,702
05 Vegetables and fruit	1.50	402,502
06 Sugar	0.71	-13,414
07 Coffee, tea, and cocoa	1.06	-200,661
08 Feeding stuff for animals	0.61	267,051
09 Miscellaneous edible products and preparations	0.87	22,638
11 Beverages	0.66	311,849
12 Tobacco	1.30	283,357
21 Hides	0.94	-13,566
22 Oilseeds and oleaginous fruits	0.71	33,374

Divisions	Terms of trade	Net exports
29 Crude animal and vegetable materials	0.76	-24,109
41 Animal oils and fats	0.50	-27,778
42 Fixed vegetable fats and oils	0.64	200,467
43 Animal or vegetable fats and oils	0.83	3,102

Source: Calculation of authors using the data of the SORS, 2024.

Table 4 shows the types of competitiveness/non-competitiveness at the level of agri-food divisions, based on the research method for the observed year. It also provides a detailed insight into the number and the share of the formed categories, i.e. groups of divisions in the entire sectoral exports. The data shows that the highest number of divisions belong to those that achieve price competitiveness (12). In addition, the greatest percentage of sectoral exports value are products (divisions) with price competitiveness (91.63%). In general, the situation is favourable because the categories of non-competitive products bring together only six divisions, with a share of only 8.37%.

Table 4. Number, codes and share in exports of agri-food divisions by category to which they belong

Grouping of divisions		2023
Competitiveness with quality	Number of divisions	2
	Division codes	05, 12
	Share in the agri-food export	34.09%
Price competitiveness	Number of divisions	10
	Division codes	00, 02, 04, 06, 08, 09, 11, 22, 42, 43
	Share in the agri-food export	57.54%
Price non-competitiveness	Number of divisions	3
	Division codes	01, 03, 07
	Share in the agri-food export	6.77%
Non-competitiveness in quality	Number of divisions	3
	Division codes	21, 29, 41
	Share in the agri-food export	1.60%

Source: Authors' elaboration and calculation on the basis of the SORS, 2024.

The data presented in Table 5 deal with the evaluation of EUV for the analysed years by the most significant export markets of Serbia, to present a comprehensive picture of the export competitiveness of this sector, bearing in mind the geographical distribution of exports. There are two markets: one brings together the European Union countries, and the other, the CEFTA markets.

Table 5. Unit values of divisional exports on the European Union and CEFTA markets

Divisions	EUV	
	EU	CEFTA
00 Live animals	3.85	3.01
01 Meat	5.13	4.03
02 Dairy products	2.65	1.80
03 Fish	16.64	6.14
04 Cereals	0.35	0.41
05 Vegetables and fruit	2.14	1.12
06 Sugar	0.86	0.97
07 Coffee, tea, and cocoa	4.77	5.00
08 Feeding stuff for animals	0.69	0.39
09 Miscellaneous edible products and preparations	2.31	3.46
11 Beverages	0.79	0.57
12 Tobacco	6.75	11.97
21 Hides	1.24	1.27
22 Oilseeds and oleaginous fruits	0.61	0.51
29 Crude animal and vegetable materials	2.63	0.68
41 Animal oils and fats	0.75	6.43
42 Fixed vegetable fats and oils	1.08	1.28
43 Animal or vegetable fats and oils	1.06	2.40

Source: Calculation of authors using the data of the SORS, 2024.

Vegetables and fruits, as the largest part of the Serbian agricultural and food sector, have a significantly higher price on the EU market. On the CEFTA market, the unit values of tobacco exports are higher, as a very propulsive division (based on the previous discussion).

Discussion

Determining the external competitiveness is extremely important, bearing in mind that the analysed sector is leading in reducing the trade deficit and external imbalance of the national economy of Serbia. Although it entails products with lower added value in comparation to other sectors, in the previous period of crises of various nature (COVID-19, disruptions in supply chains, Russian-Ukrainian conflict), we have seen the importance of this sector in ensuring the national food security, but also increased exports, which has reduced the negative consequences for the country's economic growth. In other words, the agri-food sector is important for the economy of Serbia in the context of economic and social stability (Matkovski et al., 2022). That is why increasing competitiveness is an imperative of Serbia's national agrarian policy. This implies an increase in exports, an improvement in the structure of exports and an increase in EUV, as well as adequate measures and programs of agrarian policy.

According to the value of exports, the largest share is achieved by fruits, vegetables, and cereals (together close to USD 2 billion). The authors estimate that cereals on the international market have the lowest EUV in 2023. Therefore, strengthening processing capacities to produce high-end cereal products must be imperative in the coming period. The division that includes tobacco products achieves extremely high EUV. It can be the key to positive structural adjustments. In addition, the results show that in 2023 (post-crisis period), Tobacco division together with the Vegetables and Fruits division, it achieved non-price competitiveness in international trade. Bearing in mind the assessment of EUV in the markets of the European Union and CEFTA, it is noted that in the European Union member states, more expensive products from the Fruit and Vegetables Division are exported, while highly processed tobacco products are exported on the CEFTA market.

The sector of agricultural and food products of Serbia has a dominant price competitiveness, both in conditions of the quantity of divisions and the participation of these type of products in the agri-food export. The makers of economic policy in the field of agriculture must be especially concerned about the Vegetables and Fruits; although it records a positive terms of trade, this chapter has a decline in net exports. Vegetables and fruits division is the most important export segment of the agri-food sector (Marković & Marjanović, 2021), so it is especially in the focus of scientists and practitioners who research competitiveness in the international market. Fruit and vegetable production can be significant for increasing exports of organic products, so state subsidies should go to this end. The Meat division may be ideal for increasing the level of finalization of products, but its drastic net imports is a particular trouble for agrarian policy makers. It must be noted that without developed livestock production, there is no developed agriculture in any country. Furthermore, the goal is to have as many divisions as possible in the future that will move to those that achieve competitiveness, with the aim of having as many of them as possible within the category that includes divisions with a qualitative dimension of competitiveness. When looking at the terms of trade (the ratio of EUV to IUV), we point out that the best ratios are in the Fish division, while the division that includes Cereals has the worst relative unit values.

Conclusions

Competitiveness at the macro level is conditioned by comparative advantages (climate and other natural factors), but also by other factors that build on this advantage, such as the technological level of development, quality and education of the workforce, labour productivity, etc. The level of competitiveness of exports can be compared and measured in different ways due to a wide range of factors such as: product quality, export demand, production costs, state subsidies, tariff and non-tariff barriers, crises in the global and internal markets, consumer habits. This is a phenomenon that is difficult to measure, especially when it comes to non-price competitive factors. One of the methods of looking at the factors of export competitiveness is the measurement of EUV and IUV, which was applied in this research. In this way, it is possible to gain

knowledge about price competitiveness, but also about the qualitative dimension of competitiveness that certain segments of agricultural and food products achieve abroad.

In conditions where the quantity of exports of a product reaches its maximum, the only chance for a further increase in the value of exports is a rise of the unit values of exported products, which can be ensured by higher product competitiveness. Improving the quality of products is considered one of the best solutions to increase the EUV and enhance the terms of trade (Dimitrijević et al., 2023), especially when it comes to placement on the markets of developed countries. A special place is occupied by organic agricultural production (which most often includes vegetables and fruits) based on modern environmental and safety standards. The second direction for the growth of competitiveness of export is the change of the export structure, which implies an increase in the degree of processing of food products. The possibility of higher finalization of the product is conditioned by the technological equipment and the quality of the workforce. Specialization in the production of cereals is still present, for which Serbian agriculture traditionally has a high comparative advantage. Enhancing the competitiveness of cereals can be accomplished by lower production costs, choice of better seed quality, higher productivity, and further treating within the processing industry. However, in the medium term, priority must be given to other products with a higher chance of value added and with high EUV (vegetables and fruits, tobacco products, fish, meat, animal feed).

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Conflict of interests

The authors declare no conflict of interest.

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