



Competitiveness Analysis of Main Agri-Food Products

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ABSTRACT

This paper analyses the competitiveness of the main Romanian agri-food products on the international market, using the Competitiveness Index that includes the components of market performance and gross value. The results show that Romania has a competitive advantage for cereals, wheat, maize, legumes and sheep meat, where per capita production exceeds domestic and global consumption. However, certain products such as rice, tomatoes and beef have a sub-unit index, reflecting a reduced value competitiveness against the global market. In addition, the decrease in subsidies and the demographic decline are factors that can negatively influence competitiveness. The conclusions emphasize the need for supportive policies to maintain and improve the performance of the Romanian agri-food sector in the long term.

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1. Introduction

The analysis of the competitiveness of agri-food products is a subject of great importance in the field of agricultural economics and food policies. The competitiveness of an agri-food product is not only about the ability to obtain high profits, but also involves assessing the ability of a region or country to produce and trade food products on domestic and foreign markets, while maintaining high quality standards and a long-term sustainability.

In the context of globalization and increasingly competitive markets, the analysis of competitiveness in the agri-food sector becomes essential to understand how different countries and regions position themselves in international markets and what factors determine the success or failure of their products. This analysis also contributes to the development of agricultural and economic policy strategies to support local farmers and producers in the face of global market pressures.

In this paper, we want to analyse the main agri-food products produced in Romania and determine their degree of competitiveness at the international level, with the help of the Competitiveness Index.

Next, we present a review of the specialized literature, later presenting the research methodology and its results, this paper ending with the conclusions and the list of bibliographic references.

2. Literature review

In order to better understand the topic of competitiveness in the agri-food sector, a detailed analysis of the existing literature is necessary. In what follows, we will analyse the main research and studies that have addressed this topic, exploring the various methods used and the results obtained.

A significant number of researchers have defined competitiveness in terms of economic efficiency and adaptability to international markets. Some studies focus on the analysis of production costs and selling prices, while others explore product quality, innovation and adaptability to market demands. For example, Porter (1990) introduced the concept of the "Diamond Model" to explain the competitive advantage of nations, and this model was later applied to the agri-food sector to assess the competitiveness of different regions. (Zhao, 2018)

The specialized literature presents a varied range of methods for evaluating the competitiveness of agri-food products, including comparative advantage analysis, cost and revenue analysis, SWOT analysis and econometric models. Competitiveness indicators such as RCA (Revealed Comparative Advantage) or TSI (Trade Specialization Index) are often used to quantify the performance of products in foreign markets. For example, the studies of Balassa (1965) laid the foundations of the RCA analysis, frequently used in the analysis of agri-food competitiveness. (Cvetković & Petrović-Randelović, 2017)

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Numerous researchers have identified essential factors that influence the competitiveness of agri-food products. These include production costs, transport infrastructure, product quality, sanitary and phytosanitary regulations, access to foreign markets and government policies. Also, natural resources and available technologies play an important role in the ability of an agri-food product to compete in international markets. (Babu & Shishodia, 2017)

Some studies have explored the competitiveness of agri-food products at the regional level, highlighting the differences between developed and developing regions. Other research has focused on international competitiveness analysis, assessing the performance of agri-food products from various countries in global markets. Such analyzes highlighted the importance of the integration of the production chain and the collaboration between farmers and producers to increase the competitiveness of agri-food products. (Constantin et al., 2023)

Globalization and trade liberalization have a major impact on the competitiveness of agri-food products. The opening of foreign markets led to fiercer competition, but also increased opportunities for efficient producers. Krugman's (1994) and subsequent studies have shown that countries that invest in technology, agricultural education and infrastructure are more likely to improve their long-term competitiveness. (Mazorodze, 2019)

The literature suggests that public policies and government strategies can have a significant impact on competitiveness. Financial support for research and development, tax incentives and effective regulations can help strengthen the competitiveness of agri-food products in international markets. Also, encouraging sustainability and green practices has become an important aspect in competitiveness strategies. (Matkovski et al., 2019)

The analysis of the competitiveness of agri-food products is a complex and multidimensional field, involving numerous economic, technological and political factors. The literature emphasizes the importance of an integrated approach that considers both internal factors of production and external influences of global markets. In the current context, with climate change and increased demands on sustainability, competitiveness in the agri-food sector must be not only economic, but also ecological and social.

3. Material and Method

In order to determine the competitiveness of agricultural products produced in Romania, the methodology established by Stoychev & Ivanov, (2022) was considered, who carried out this measurement with the help of the Competitiveness Index, according to the following formula:

$$\text{Index of competitiveness} = \frac{MPC+VC}{2}, \text{ where:}$$

MPC represents the market performance component and VC represents the value component.

These two components in turn have determining factors, as follows:

MPC represents the ratio between the per capita production of the respective product in the country for which the indicator is calculated and the sum of the per capita consumption of the respective product in the chosen country and the per capita consumption worldwide.

VC represents the ratio between the gross value share of the local production (of the country) per capita and to the denominator, to this previously presented share, the gross value share of the world production per capita is added.

This competitiveness index can be subunit in the case of less competitive products and superunit in the case of products with a competitive advantage.

To determine this index, secondary data from international and national databases such as FAOSTAT and INS were used, in order to quantify the indicators that make up the final index, namely the production of the main agri-food products, their consumption and the value of production, all of which are related to the population, both globally and nationally.

4. Results and Discussion

In the framework of the research, it was desired to determine the index regarding the competitiveness of Romanian products at the macroeconomic level, thus the two components of the index were considered, respectively the component regarding the market performance and the value component.

Through this analysis, we wanted to determine the level of competitiveness for as many agri-food products made in Romania as possible, but this list kept getting shorter considering the unavailability of data for certain indicators and implicitly the impossibility of determining the index for the respective products. Therefore, it started with a list as large as possible, and later the competitiveness index was determined for certain agri-food products, which recorded data for both components.

As previously mentioned in the methodology, the market performance component (MPC) is determined by the per capita production of the respective product in the numerator, and the denominator is

determined by the sum of the per capita consumption of the respective product at country level and per capita consumption of the respective product worldwide.

In figure 1, the index showing the market performance component is determined, depending on the agri-food products produced in Romania, depending on the availability of data.

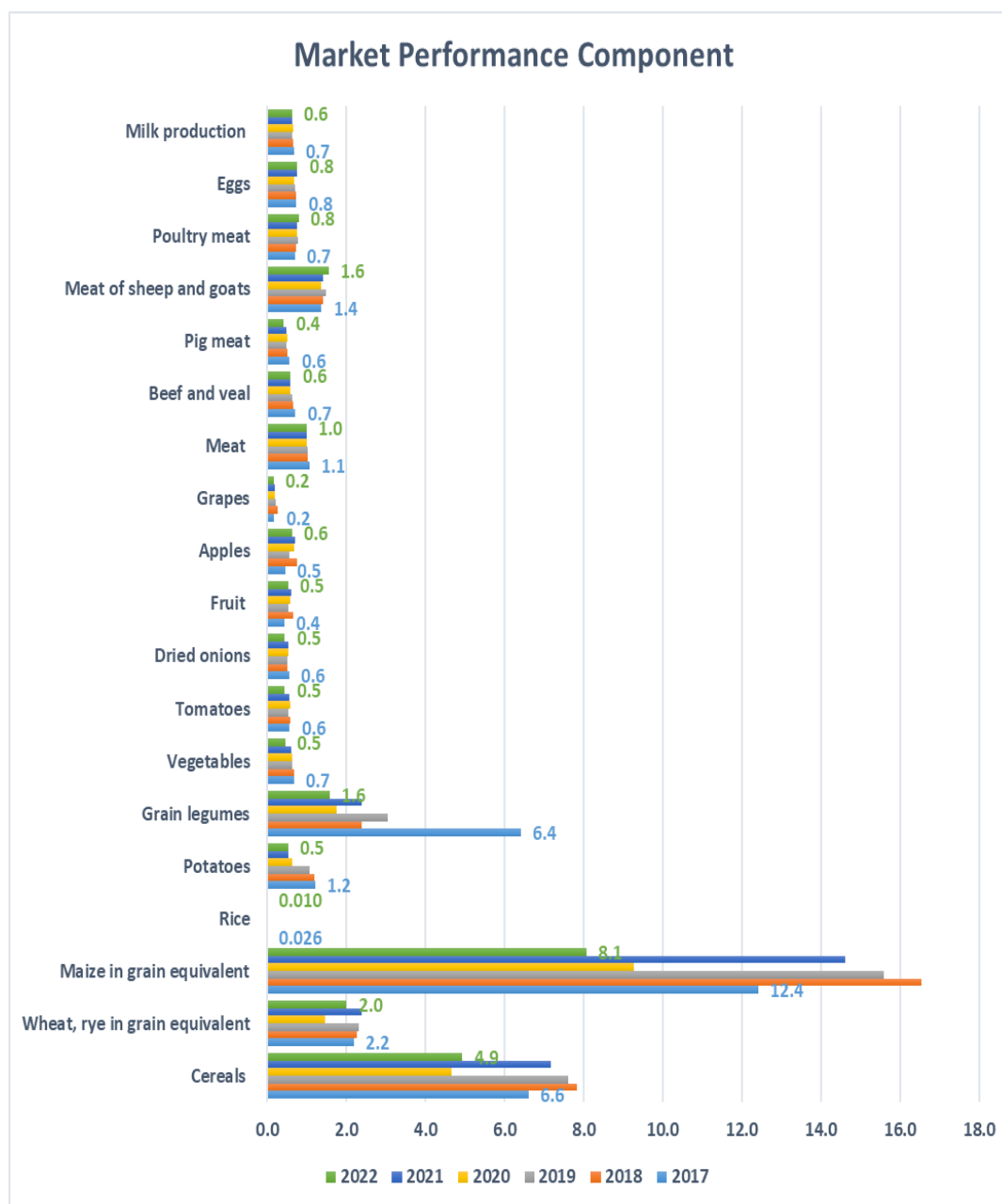


Figure 1. MPC index according to the products made in Romania

Source: own calculations based on Stoychev & Ivanov (2022) methodology and FAOSTAT and INS data

From the analysis of the data it can be seen that the production of agro-food products per capita is superior to the consumption per capita at the national and international level for cereals, wheat, corn, legumes, and sheep meat.

However, certain downward trends can be observed in terms of this component of market performance, especially for products whose productions are higher than national and international consumption, respectively there is a 25% decrease in the index in terms of cereals and a 35% drop in the corn index, these are the product groups with the highest values of this market performance component.

In figure 2 we identify the dynamics of the second component of the competitiveness index, namely the component that measures the value of the products. This is determined by the following ratio, i.e. the numerator takes into account the weight of the gross value of production per capita for the respective country, and the same weight is taken into account in the denominator to which is also added the weight of the gross value of production per inhabitant at the level world.

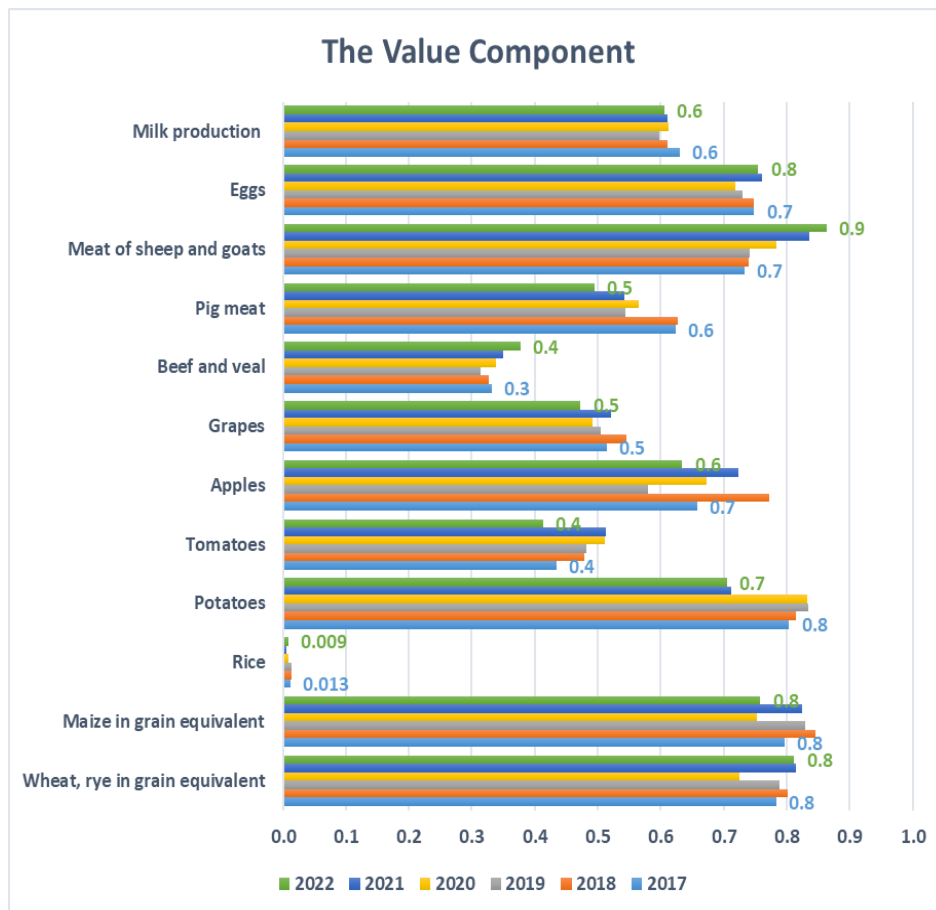


Figure 2. VC index according to the products made in Romania

Source: own calculations based on Stoychev & Ivanov (2022) methodology and FAOSTAT and INS data

From the analysis of the data it can be seen that the production of agro-food products per capita is superior to the consumption per capita at the national and international level for cereals, wheat, corn, legumes, and sheep meat.

Analysing the value component within the competitiveness index, differences can be observed regarding the analysed product groups. This indicator can take values between zero and one, given that it represents the share of the value of production per capita from the same value to which is added the value of production per capita worldwide. This indicator can be interpreted in the following way, if the resulting value is below 0.5 we can consider that the value of production per inhabitant in the respective country is lower than the value produced per inhabitant worldwide and vice versa.

It can be observed that only for rice, tomato and beef products the value of the indicator is below 0.5, which determines the fact that the value of production per capita worldwide is higher than the value per capita produced in Romania, our country having a disadvantage in this regard. Analysing the other products, a value of this component above 0.5 is observed, which determines an advantage of the production value. It should be mentioned that the gross value of production is determined per inhabitant, and as it is known the demographic factor in Romania is in decline, hence there may be certain increases in the calculated indicator. From the analysed figure, we note that products such as wheat, corn and potatoes register the highest value for this indicator, of 0.8, thus, the gross value of production per inhabitant, in Romania, is much higher than the gross value per inhabitant in world level.

Depending on these two previously presented indicators, it is possible to determine, in figure 3, the competitiveness index for the main agri-food products presented in the previous analysis. Depending on this index, it is possible to appreciate which agri-food products made in Romania register a higher value of competitiveness compared to others.

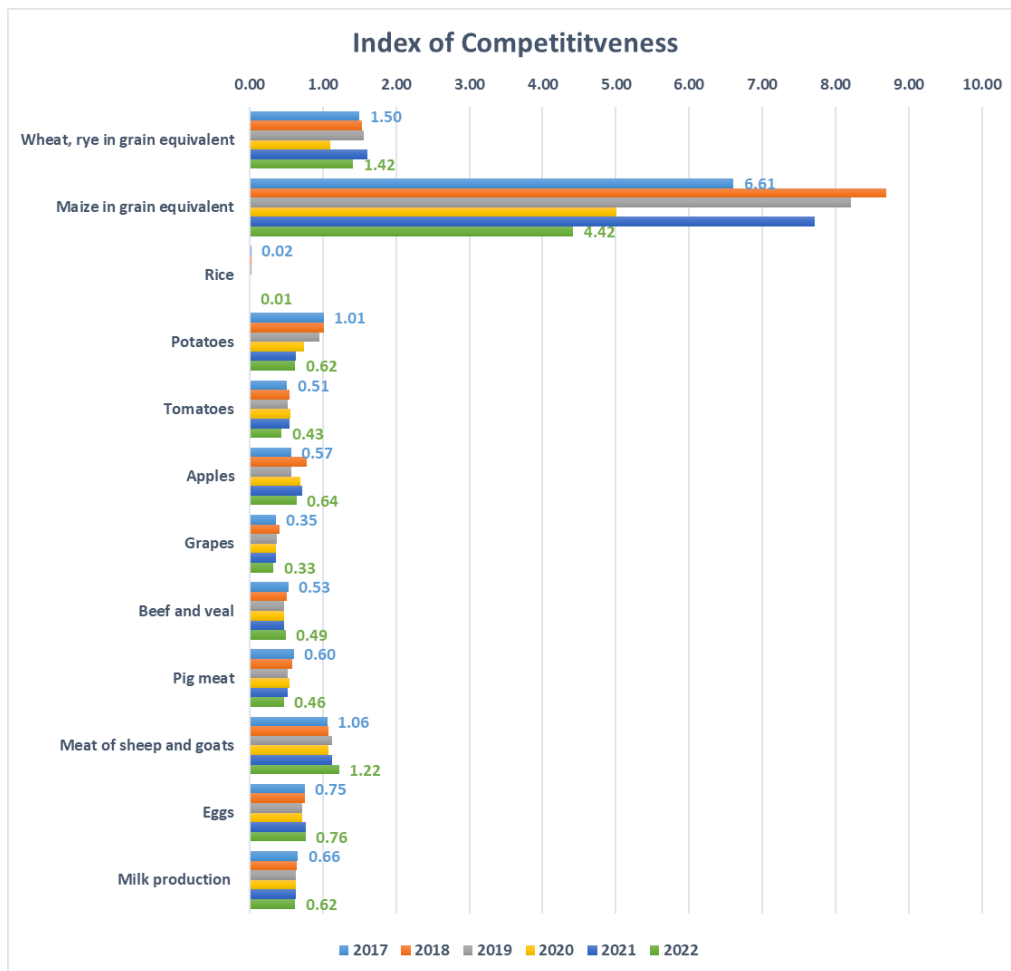


Figure 3. Competitiveness index according to the products made in Romania

Source: own calculations based on Stoychev & Ivanov (2022) methodology and FAOSTAT and INS data

As can be seen from figure 3, the main agri-food products for which a competitive advantage is registered are those whose index values are above unity, respectively, the most competitive product being corn, the index decreasing from 6.6 to 4.4, but much above the unitary value, then we observe a high index of competitiveness for wheat of 1.4-1.5 and also above unitary is the index for sheep and goat meat, the index increasing from 1.06 to 1.22.

Among the products that do not present a competitive advantage, we can mention the group of potatoes that registers an index of 0.83, on average, this product being competitive at the beginning of the analyzed period, and subsequently decreasing this competitiveness. This situation can also be attributed to the discouragement of farmers to sow large areas with potatoes, considering the drastic reduction of subsidies dedicated to this product during the same period.

5. Conclusions

Following the analysis of the data presented, we can draw some key conclusions about the performance of agri-food production in Romania in relation to domestic and international demand.

First, it finds that per capita production for certain agri-food products, such as cereals, wheat, maize, pulses and sheepmeat, exceeds the level of domestic and international consumption. This suggests that Romania has a production capacity that allows covering domestic demand and offers possibilities to compete on foreign markets for these products.

However, there are some downward trends in market performance for certain products, particularly cereals and maize, where the market performance indicator has decreased by 25% and 35% respectively. These declines could indicate future challenges in maintaining competitive advantage, possibly due to economic or political factors influencing the agricultural sector.

Another important aspect is value competitiveness. Its indicator, which compares the value of production per inhabitant in Romania with the world one, shows that for certain products, such as wheat, corn and potatoes, Romania has a competitive advantage, with values above 0.5. However, for products such as rice, tomatoes and beef, this indicator is below 0.5, indicating a disadvantage in the value of production per capita compared to the world average.

It is also worth noting that while products such as maize and wheat remain competitive with competitiveness indices above unity, the competitiveness index for potatoes has fallen below this value. This decrease is attributed to the reduction of subsidies, which discouraged farmers from growing potatoes on the same scale, thus affecting the competitiveness of this product in the market.

Last but not least, the demographic factor in Romania has an impact on these indicators. Population decline artificially inflates the value of output per capita for certain products, which may suggest greater competitiveness than it actually is. It is important that this trend be monitored in the future in order to have a clearer picture of the real competitive advantages of the Romanian agri-food sector in the context of demographic evolution.

These conclusions highlight both the strengths of the agri-food sector in Romania, as well as the challenges and vulnerabilities that can influence the maintenance and improvement of long-term competitiveness.

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