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FOOD SECURITY EVALUATIONS RELATED TO EU-27 FOREIGN TRADE, PRIOR *vs* POST EASTERN ENLARGEMENTS

ABSTRACT

The study aims to analyze aspects of food security in relation to the agri-food foreign trade developments in the EU Member States prior and post Eastern enlargements. Given the multiple benefits of the open markets, relevant foreign trade indicators have been selected to be quantified: from the set of indicators established by FAO to capture several influences on food security, the cereal import dependency ratio has been calculated as an indicator of the food security variability/stability; the competition effect has been assessed by measuring the relative competitiveness of the Member States' agriculture on the world market. The results of the evaluations, based on Eurostat statistics related to the period 2001–2013, highlighted market share variations in Romania's agri-food performances compared to the EU-27 trade partners and stability gains on the cereals market, in the two reference periods.

Key words: agri-food foreign trade, competitiveness, food security.

JEL Classification: Q17, F17, Q18.

1. INTRODUCTION

The study has the goal to investigate food security at national level in the context of the world agri-food trade, compared to the EU-27 Member States.

In order to capture different aspects affecting food security, FAO has established a set of indicators grouped by the four dimensions of food security: *availability, physical and economic access, utilization and stability of agri-food supply*. According to the FAO approach to food security, two main aspects have been included, i.e. *food self-sufficiency*, which implies meeting the domestic food consumption needs from domestic production, and *self-supply in food products*, which requires the provision of domestic consumption availability. While self-sufficiency excludes imports as a main supply source, self-supply does not foresee such a restriction (FAO, 2003). Yet, a domestic capacity is necessary, able to generate coverage of imports through foreign trade, in the quantities needed for domestic consumption, in the case of products for which, based on the comparative advantage, it is more efficient to buy than to produce them.

As it is a well-known fact that the opening of the external markets contributes to economic growth, allows the access of commodity flows to deficit areas, increases the products and consumption diversification and a stable and secure agri-food supply, the following foreign trade indicators have been selected: *the competition effect*, measuring the relative variation of the increase of Member States agri-food products competitiveness on the world market; *the cereal import dependency ratio*, included in the set of indicators of variability/ stability and food security within the FAO methodological framework.

The result of the analysis of the indicators levels and trends reflects aspects from the foreign trade perspective linked to food security for Romania, by comparison with the trade partners, in the two recent reference historical periods, i.e. prior and post Eastern enlargements of the European Union.

2. STATE OF KNOWLEDGE

At present, the information system on the world food security benefits from a vast database created by FAO. Under the World Food Security Committee, in the year 2011, the experts gathered at FAO headquarters for the assessment of the world food deficit established an initial set of indicators aiming at capturing various aspects of food insecurity.

The food security indicators have been grouped by four dimensions, namely: *availability, physical and economic access, food supply utilization and stability*. In order to facilitate their interpretation, they have also been classified as indicators of the determinative factors of food insecurity and of its consequences, as follows: the static or dynamic determinants refer to the structural conditions that could aggravate food insecurity in the absence of adequate political interventions.

On the basis of relevant indicators, the assessments and analyses are approached in the context of the addressability level and that of political impact:

- The relationship between the trade reforms and food security is one of the most important debates within the international trade negotiations of the World Trade Organization (FAO, 2000). The international dimension is important, as the trade policy is influencing both the food products availability at world level, according to the importer or exporter status, and the national availability of food products, both through imports and production.

- The effects upon the food imports are determined through the implications of the trade policy upon the gains from the foreign exchange. The trade policy will also have implications for the food security through the relationship between incomes and expenditures; any change in the trade regime will have a direct effect both upon rural and urban incomes, upon labor employment, and through them upon income distribution.

- Both the national food availability and the governmental incomes have an impact at the level of households, affecting the access to food products, by the indirect and direct means of incomes.

OECD has estimated that the demand for food security, perceived in association with the domestic production, fast decreases to zero as the domestic production potential increases (OECD, 2001). From this perspective, food security can be classified as a resource with open access without exclusivity and obstruction in consumption. A system with food and retail chains that are working well is an example that matches the definition.

Within the United Nations Food and Agriculture Organization (FAO), food security was defined, in a large sense, as being reached when all people, at the same time, have physical and economic access to sufficient, safe and nutritious food, who are able to satisfy their dietary needs and food preferences for an active and healthy life (FAO, 1996). The approach to food security at different analysis levels according to the reference scale, identifies specific aspects, such as:

- The individual food security or food security at household level refers to incomes, access to resources and food products. It is largely a purchasing power issue, but also concerns particular aspects such as food desert areas¹.
- The national food security refers to a country's capacity to consume enough food, even in the conditions of serious disturbances along the supply chain. It can also be relevant at the level of a trade block, such as the EU area.
- The regional food security could be also relevant as a political theme.
- The global food security refers to the world agricultural producers' capacity to satisfy the global demand, as well as to the efficiency and effectiveness of the marketing and distribution systems.

The analysis of the relationship between foreign trade and food security presupposes a series of approaches necessary to evaluate the link between the trade policy and food security, specific for each country in order to anticipate the possible effects (FAO, 2003). Firstly, one should identify those policies disadvantaging the domestic agriculture compared to other sectors, and, where appropriate, distortions should be reduced or eliminated. Secondly, the country should be classified into one of the types corresponding to the trade status resulting from sector performance, which reveals the sensitive points to the political impact upon food security, namely:

- In the case of a net exporting country, with efficient producers, food security does not represent a problem. When there is natural self-sufficiency, the domestic prices should be equivalent to the world prices, and the producers should be capable to respond to the local food demand and to export or stock products as reserve for an unfavorable year. Thus, the trade liberalization can bring benefits to the net exporting or naturally self-sufficient countries. On the contrary, in case of natural insufficiency, but where gains from exports are available to cover the food needs from imports, the country runs the risk of being dependent on the raw materials export.

¹ "Food deserts" refer to the geographical zones where the access to retail selling points and healthy foods is rather limited, mainly for persons with low incomes or without own transport means.

- In the case of the countries that are unsecure from the point of view of providing food products from their own natural resources, an active food security policy is needed, because the farmers will need support for the confrontation with higher import costs in the case of multilateral liberalization, which results in food prices increase.

- The countries at the limit of self-sufficiency are the most susceptible of being negatively affected by the subsidized imports, and in this case the problem of compensatory measures appears. At last, some countries could be at the limit of self-supply in the case when incomes from export are volatile.

3. MATERIAL AND METHOD

Accepting the self-supply as a means to ensure food security, the indicators regarding the *competition effect* and the *cereal import dependence ratio* in the period 2001–2013 will be investigated on a comparative basis in the EU-27 Member States.

In order to make the necessary calculations necessary for the quantitative and qualitative analyses, the Eurostat database for the period 2001–2013 was used, containing the statistics of the foreign trade with agri-food products, codes 01–24 from the Combined Nomenclature (CN).

The competition effect captures the market share gain or loss, quantifying the extent to which the market share variation was determined by changes of competitiveness through prices or other factors (Rusali, 2015). In the present paper, the *competition effect* was estimated by measuring the relative variation of the market share of the national agri-food products in the EU-27 Member States on the world market. The indicator is calculated as difference between the market share value of the analyzed country's exports in the two investigated periods, namely 2001–2006 and 2007–2013.

From the set of indicators for the evaluation of food security, those indicators revealed by the evaluations of the foreign trade referring to the dimension of the food stability or vulnerability were selected.

Based on the FAO methodology, the *import dependency ratio* (IDR) in cereals was calculated, as an adequate index for measuring a country's self-sufficiency in cereals and the potential impact of shocks on the world trade market.

IDR refers to the value of cereal imports and shows the share of imported and domestically produced cereals in the domestic available supply of food products under the cereals' chapter. The index is calculated as ratio of net trade to consumption availability, the calculation formula being the following:

$$IDR = (Y - X) / (P + Y - X) * 100 \quad (1)$$

where,

Y = cereal imports; X = cereal exports; P = cereal production.

The results obtained using Formula (1) are relevant only for positive values, while negative values show a net export. In the FAO methodology, the index is calculated as average of values recorded in three-year periods. In the present paper, the indices were calculated on the basis of yearly values from the Eurostat statistics of foreign trade for the EU-27 countries, in the period 2001–2013.

4. RESULTS AND DISCUSSIONS

By comparing the agri-food trade flows of the EU-27 countries in the periods 2001–2006 and 2007–2013, a relatively balanced increase of the average values of exports and imports was noticed, i.e. 1.5 times increase in each case, and a diminution of the average value of the trade deficit by 3.5 billion Euro (Table 1).

However, two-thirds of the EU-27 countries had a negative agri-food trade balance and the average values in the analyzed periods show an increasing deficit trend in these countries. This aspect is mainly noticeable in the countries with the highest disequilibria of the agri-food trade balance in the investigated periods, out of which the top five are the following: United Kingdom, Italy, Germany, Sweden and Portugal.

Table 1

Agri-food trade of the EU-27*, in the periods 2001–2006 and 2007–2013 (billion Euro)

	Export				Import				Trade balance	
	Average 2001–2006	Average 2007–2013	%		Average 2001–2006	Average 2007–2013	%		Average 2001–2006	Average 2007–2013
Netherlands	40.5	66.8	17.9	Germany	45.1	67.4	17.6	Netherlands	17.8	24.2
Germany	33.5	56.0	15.0	United Kingdom	36.6	46.0	12.0	France	8.2	9.7
France	38.7	51.4	13.8	Netherlands	22.7	42.6	11.1	Denmark	5.6	5.5
Spain	21.5	30.2	8.1	France	30.5	41.7	10.9	Spain	1.5	3.4
Belgium	21.7	30.1	8.1	Italy	26.8	35.7	9.3	Poland	0.7	2.9
Romania	0.6	3.1	0.8	Romania	1.7	4.1	1.1	Romania	-1.1	-1.0
Estonia	0.5	1.1	0.3	Slovenia	0.9	1.7	0.5	Portugal	-3.3	-3.7
Luxembourg	0.7	0.9	0.2	Latvia	0.7	1.6	0.4	Sweden	-3.2	-4.9
Slovenia	0.4	0.8	0.2	Estonia	0.8	1.3	0.4	Italy	-7.0	-7.2
Cyprus	0.3	0.3	0.1	Cyprus	0.6	1.0	0.3	Germany	-11.6	-11.4
Malta	0.1	0.2	0.0	Malta	0.4	0.5	0.1	United Kingdom	-20.0	-25.4
EU-27	242.6	373.3	100	EU-27	255.9	383.1	100	EU-27	-13.3	-9.8

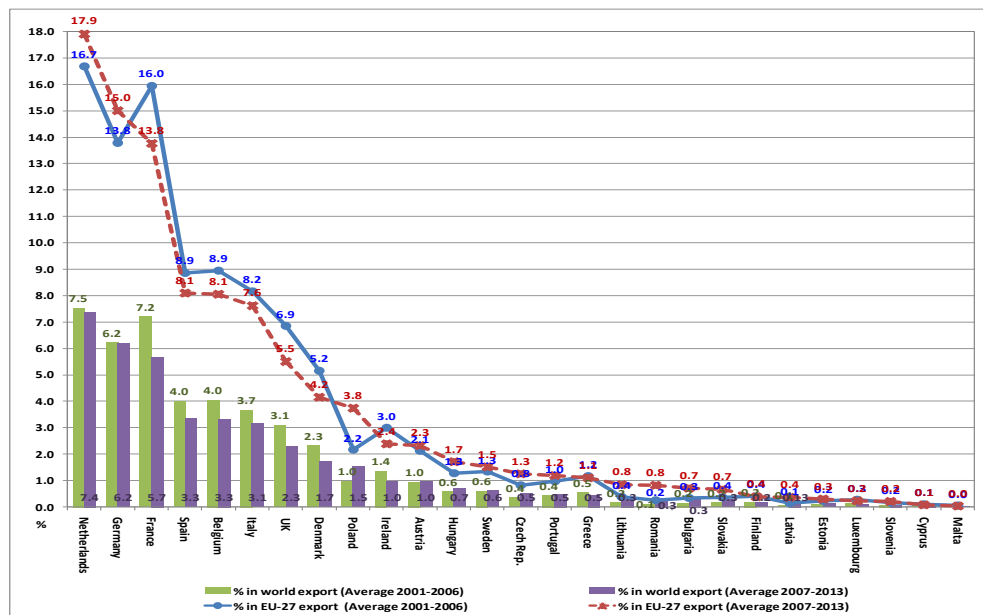
*Top five selected countries with maximum and minimum values of export, import and trade balance.

Source: Eurostat, author's processing.

At the same time, Romania's agri-food exports also increased, between the analyzed periods, from 0.6 billion Euro to 3.1 billion Euro, with an increasing share in total agri-food exports of the EU-27, from 0.2% to 0.8%.

Between the compared periods, the Romanian agri-food exports had the highest increase in the area, more than five times on the average; imports increased as well, yet by a lower rate, i.e. 2.4 times, while the average value of Romania's agri-food trade deficit diminished by 78 million Euro.

The results regarding the share of Member States exports in the world agri-food market and in EU-27, on a comparative basis, in the periods 2001–2006 and 2007–2013, are graphically presented in Fig. 1.

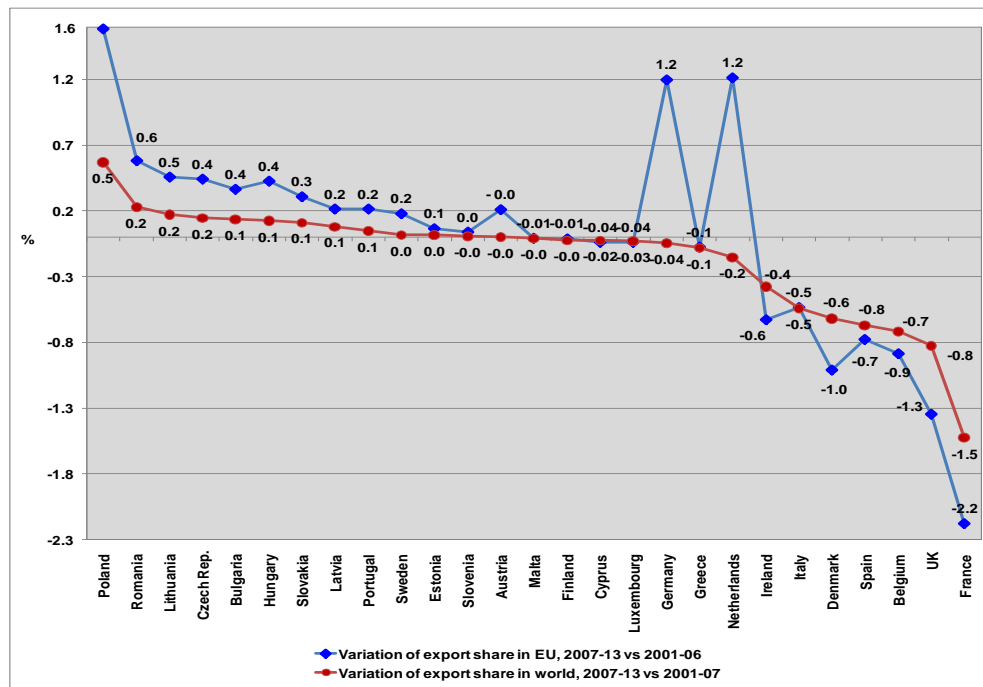


Source: Eurostat, author's processing.

Figure 1. Share of Member States' exports on the world agri-food market and in EU-27, in the periods 2001–2006 and 2007–2013.

Comparing the market shares of the agri-food products exported by the Member States in the periods 2001–2006 and 2007–2013, calculated as averages, it can be noticed that the top five countries with the highest shares on the world market (63%, on a cumulated basis), and also on the EU-27 market (26%, on a cumulated basis), were the Netherlands, Germany, France, Spain and Belgium. Romania experienced increases, from 0.2%, in the first period to 0.8% after the accession, as regards its share in the agri-food export of the EU-27 and from 0.1% to 0.3% of the world market share respectively.

The estimates show a positive competition effect between the compared periods, in half of the EU-27 Member States, namely in those that increased their market shares; among these countries, the highest increases were found in Poland, the Netherlands, Germany, Romania and Latvia (Fig. 2).

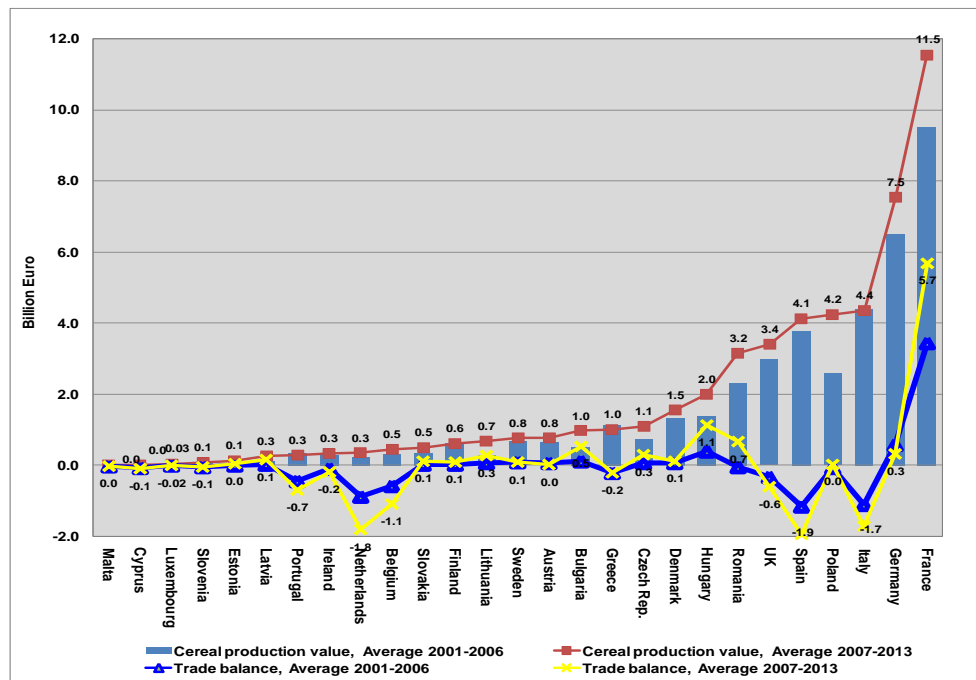


Source: Eurostat, author's processing.

Figure 2. Variation of Member States' agri-food export shares in the world and in EU-27, in 2007–2013 vs 2001–2006.

A decrease by -3.9% of the EU-27 export share on the world market was estimated, from 45.2% to 41.3% on the average; this decrease was mainly due to the countries that have had the highest decreases of market shares, i.e. France, United Kingdom, Belgium, Spain and Denmark. Germany stands out in this respect, this country gaining from the variation of EU-27 average exports between the two periods; however, in the period 2007–2013, Germany had a slight loss, although the world market share was maintained at 6% on the average in each of the two compared periods. Romania also stands out with one of the highest increases of agri-food exports on the world market, i.e. by 0.2% (after Poland) and by 0.6% in the exports of EU-27.

From the analysis, it resulted that the variation of the EU-27 cereal exports are also significantly influenced by the evolution of the cereal production. According to the aggregated statistics in the periods of analysis, the average value of the EU-27 cereal production increased from 41 billion Euro, in the period 2001–2006, to 50 billion Euro, in the period 2007–2013 (Fig. 3).



Source: Eurostat, author's processing.

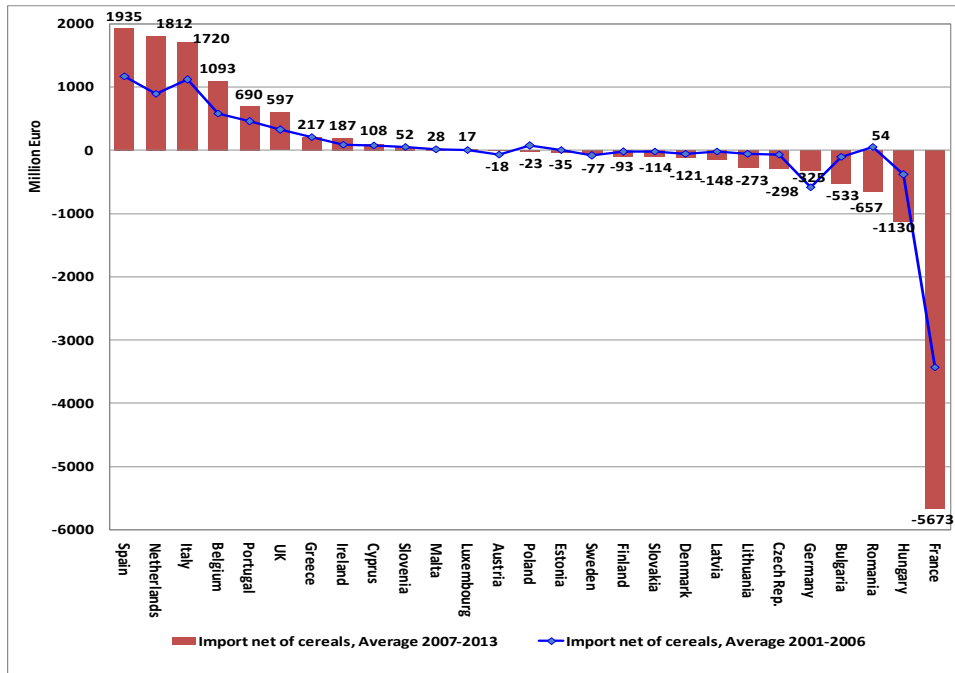
Figure 3. Cereal production value (in base prices) and trade balance, in EU-27, in the period 2007–2013 vs 2001–2006 (average values).

The top five states with the highest average values of cereal production were France, Germany, Italy, Poland and Spain, which supplied 65% of the EU-27 cereal production, in the first time period; their share was down to 63% in the second analyzed period. At the same time, Romania was on the 7th position in the EU-27 as share of the cereal production, worth 2.3 billion Euro in the first period, and 3.1 billion Euro in the second period of analysis, up from 5.6 to 6.3 % in the post-accession period.

The comparison of the trade balance in cereals reflects in most countries a similar trend with the variation of cereal production, except for Italy, Portugal and Greece, where decreases of the average values of the production were noticed; Germany, Austria and Sweden were also an exception, where the net exports decreased.

As regards the net cereal imports of the EU-27 Member States, according to the average values in the periods 2001–2006 and 2007–2013 (Fig. 4), the results indicate 12 net cereal importing countries, among which the top five are Spain, the Netherlands, Italy, Belgium and Portugal, with a cumulated share of 58.5% in the EU-27 cereal imports. The average value of the cereal imports in the net importing countries was over 11 billion Euro in the period 2007–2013, i.e. 71% of the cereal imports of the EU-27.

In this context, Romania exceeded the cereal importer status (from the period 2001–2006), proved by the absorbed net import, of 54 million Euro on the average, obtaining net cereal exports in the period 2007–2013, with an average value of 657 million Euro.



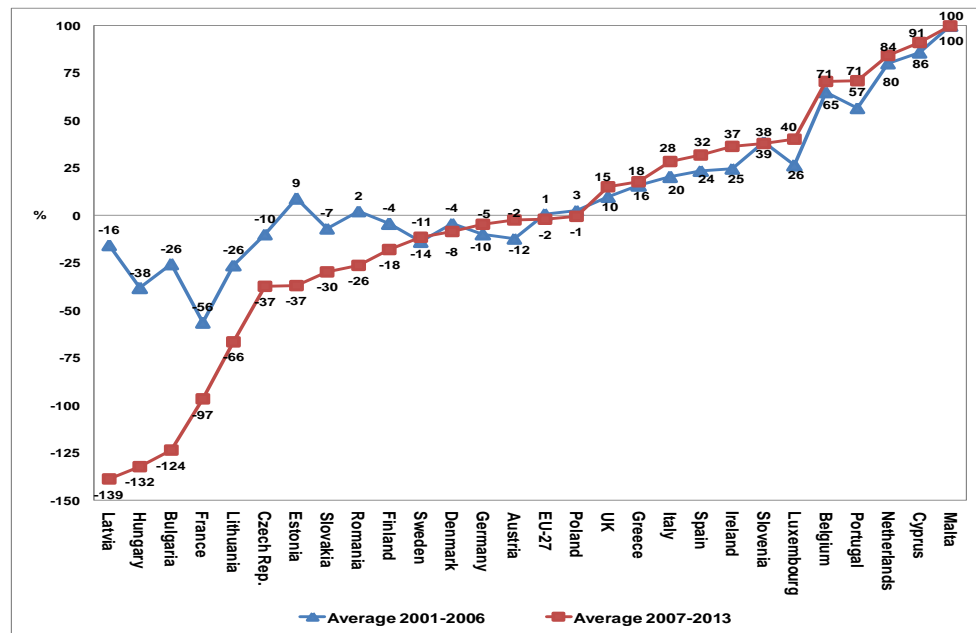
Source: Eurostat, author's processing.

Figure 4. Net cereal imports in the EU-27, 2001–2006 vs 2007–2013 (average values).

The estimates of the cereal import dependency ratio in the EU-27 Member States, comparing the average values from the periods 2001–2006 and 2007–2013, are illustrated in Fig. 5.

In the figure above, it must be noted that the negative IDR values indicate net export.

It was found that in almost half of the EU-27 Member States high values of the cereal import dependency ratio were estimated, among which Malta, Cyprus, the Netherlands, Portugal, Belgium, Luxembourg, Slovenia and Ireland have the highest dependency; this situation is correlated with the fact that they have the lowest cereal productions. In Romania, although the average cereal production cumulated high values, an import dependency ratio previous to the accession was estimated, subsequently corrected in a positive sense.



Source: Eurostat, author's calculations.

Figure 5. Cereal import dependency ratio in the EU-27 Member States, in the periods 2001–2006 and 2007–2013.

5. CONCLUSIONS

The estimation of the market share variations represents a useful instrument for the study of the competition effect, regarding the increase or loss of market share, or the increase of a country's exports and allows for different comparative analyses (Jankune et al., 2015). The results showed that Romania's performances on the EU-27 market and on the world market do not raise food security problems, if productions are maintained.

Two-thirds of the EU-27 states had a negative agri-food trade balance and the average values in the analyzed periods show an increasing trend of these countries' deficit. The results indicate 12 net cereal importing countries, among which the top five are Spain, the Netherlands, Italy, Belgium and Portugal, with a cumulated share of 58.5% in the EU-27 cereal imports.

The comparative analysis of the competition effect evolution in the EU-27 Member States, in the periods 2001–2006 and 2007–2013, identified the increase of Romania's agri-food exports share on the world market in the post-accession period, indicating a dynamic evolution of Romania's exports relative to the global demand.

The results regarding the estimations of the import dependency ratio in cereals show that almost half of the EU-27 states have high import dependency values, correlated with low productions compared to the remaining countries. Although the average cereal production of Romania proved sustainable potential, an import dependency ratio in the period prior to accession was estimated.

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REFERENCES

1. FAO, (2003), *Trade Reforms and Food Security: Conceptualizing the Linkages*. Rome.
2. FAO, (2000), *Agriculture, Trade and Food Security: Issues and Options in the WTO negotiations from the perspective of developing countries*. Vol. 1. Rome.
3. FAO, (1996), *Rome Declaration on World Food Security and World Food Summit Plan of Action*. World Food Summit 13–17 November 1996, Rome.
4. OECD, (2001), *Multifunctionality*, pp. 74–83.
5. OECD, *Multifunctionality: the policy implications* (2003), pp. 96–98.
6. Rusali Mirela-Adriana, (2015), *Analiza competitivității României pe piețele agroalimentare extra-UE, prin metoda cotelor constante de piață*; pp. 189–194; In: Alexandri, C., Florian, V., Kruszlicika, M., Rusu, M. (coord.), *Perspectivile agriculturii și dezvoltării rurale prin prisma noii politici agricole comune 2014–2020*, Editura Academiei Române.
7. Jankune Gyongy, Wagner H., Gavrilescu Camelia, Rusali Mirela, Toderoiu F., Bucur S., Bucur Carmen, (2015), *Competitiveness of Hungarian and Romanian agri-food products in intra –and extra EU trade*; pp. 9–30; In: Vasary Viktoria, Voicilas D. (coord.), *Agricultural Economics and Rural Development at the beginning of the programming period 2014–2020 in EU member states – Comparative analysis for Romania and Hungary*, (Agricultural Economics Books Series), Publisher: Research Institute of Agricultural Economics, Budapest.
8. Vlad, I.V. (coord.), (2016), *Strategia de dezvoltare a României în următorii 20 de ani*, vol. II, Editura Academiei Române.