

## THE ANALYSIS OF THE CONVERGENCE OF HORTICULTURAL SECTOR IN ROMANIA AND COMPARISONS WITH OTHER EU COUNTRIES

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### *Abstract*

*The paper aims to analyze the degree of convergence of the horticultural sector in Romania with other EU member states taking into consideration the competitiveness indicators. In order to be able to establish a causal link between the factors of competitiveness in determining the degree of convergence of the horticultural sector, certain indicators of competitiveness were considered such as the family income of the holding per annual work unit (AWU) and the net added value per unit of annual work. In addition, other indicators were calculated, such as gross value added/AWU and the total value of production. These indicators were calculated based on FADN data, covering the period 2013-2018 including for several other member states of the European Union in order to make comparisons with Romania. The results show a low level of competitiveness compared to all countries analyzed, which indicates that the horticultural sector in Romania is not yet close to achieving the economic convergence with the main EU horticultural sectors of some countries which represent Romania's competitors in the field.*

*Key words:* Romanian horticultural sector, convergence, competitiveness

### INTRODUCTION

The paper aims to analyze the degree of convergence of the Romanian horticultural sector by looking at several indicators of profitability and viability (family income of the holding per unit of work and the net added value per unit of annual work). In addition, other indicators were calculated, such as gross value added/AWU and the evolution of the production value. At the same time some comparisons were made with several EU countries. There are currently many concerns about assessing the competitiveness of the horticultural sector due primarily to the measures and instruments provided by the Common Agricultural Policy as it is desired to observe their impact on total production, yields and incomes of farmers and the degree of convergence. The study is also important in order to improve the domestic supply and meet consumer requirements. The instability of the vegetable market, the high volatility of prices and the weak capacity to provide the raw material needed for processing plants further accentuate the need to ensure the stability of the vegetable supply, and

especially to find solutions to improve the use of factors that contribute to increasing competitiveness such as supply chain, consumption of inputs, technical progress, given the existence of a rather low level of capitalization of the sector and a domestic production that is still far from ensuring the consumer demand of the population and possibly the creation of a competitive producer status within Europe. At the same time, the poor organization of the supply chain, the small number of producer groups and organizations in the sector contribute to maintaining a low level of competitiveness of the sector. A similar analysis was undertaken for the German horticultural sector, by making a comparison of the German business environment with some other eight European countries using a scoring-model [7] and in Republic of Moldova [5].

### MATERIALS AND METHODS

In this study, the convergence is analyzed by taking into consideration some competitiveness indicators [2]. Competitiveness can be studied in a national

or international context through sector analyzes. The competitiveness of a sector is reflected in its profitability and ability to maintain in the domestic market and / or export markets. Some authors [12] defines competitiveness using several categories of factors: 1) actual production and trade characteristics (competitiveness can be evaluated by production evolution, export and import index, the position regarding the comparative advantage, etc.) and 2) the strategic management of the firm referring to the business structure and its strategy. Also, competitiveness can be calculated by using several indicators related to profitability/viability, productivity, efficiency and costs). To date, there is no generally accepted definition of competitiveness measurement so comparative analyzes and case studies can complement a competitiveness analysis [9].

On the other hand, some scholars [6] consider that a large impact on the competitiveness of companies includes the level and intensity of education, natural resources (including the neo-factors) and environmental/business policy. It is well known that in agriculture, the factors which influence competitiveness are mainly related to the agricultural input prices and subsidies [8]. To date, there is no full agreement on the assessment of competitiveness, some researchers stressing that there is no perfect way to measure competitiveness, [10] and [11]. However, most theories point to technology and productivity as factors that influence long-term competitiveness which could contribute to increased real convergence. The convergence analysis using competitiveness indicators of the horticultural sector is performed at the European Union level for the years 2013-2018 taking into consideration 9 countries, including Romania. The analysis is based on FADN data (Farm Accountancy Data Network), EUROSTAT data (Economic Accounts of Agriculture), Tempo-online. The indicators used to assess the competitiveness of the Romanian horticultural sector in order to determine the degree of convergence with the EU can be grouped as follows:

1. Viability/profitability indicators

- 1.1. Farm net value added
- 1.2. Agricultural family income
- 1.3. Net value added/annual work unit (AWU) in the horticultural sector
- 1.4. The production values

For evaluation the competitiveness of horticultural products some authors used a score assessment (methodology presented in the annual Global Competitiveness Report) [1].

## RESULTS AND DISCUSSIONS

### Farm net value added

In this study it was analyzed the financial viability of the Romanian horticultural production by observing the capacity of a horticultural farm to create increased revenues and achieve superior profit margins. Accordingly, it was calculated the indicator referring to the real income of the agricultural factors per annual work unit, which is known also as the Farm Net Value Added (FNVA) reported at the cost of the agricultural factors per total annual work unit.

The indicator reveals the level of compensation of fixed production factors per labor resource used in horticultural activities and can be calculated by subtracting the operating costs from total production. The value of intermediate consumption and consumption per unit of fixed capital shall be calculated by subtracting the value of agricultural production from basic prices and adding the value of subsidies less taxed on production. The percentage change in the real income of the holding per unit of annual work is known as the agricultural income indicator, and is calculated for the period 2013-2018.

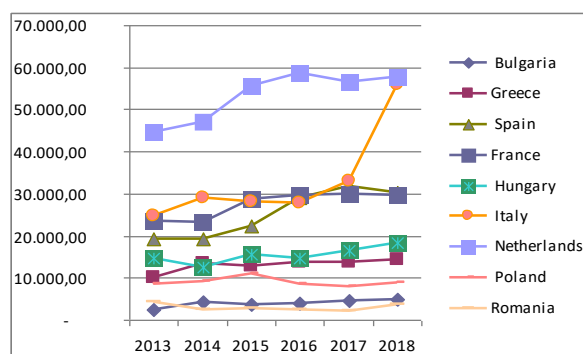


Fig. 1. Agricultural net value added per unit of annual work in the horticultural sector (euros/ha)  
 Source: calculations based on FADN, 2021.

As it can be seen from Figure 1, according to the results, until 2018, the increase in agricultural income in the horticultural sector in Romania was on average lower compared to all other countries included in the analysis. There is a very high volatility of this indicator, partly due to the high volatility of yields and prices for primary horticultural products, this indicator being much lower even when compared to Bulgaria about 1.6 times in 2018. Compared to countries such as the Netherlands, France and Spain, it is extremely low, 25 times lower, and 5-6 times lower than countries such as Poland and Hungary. Over the whole period analyzed, the value of income, and therefore the value of the FNVA index, increased for all former EU member states included in the analysis, the Netherlands, France and Spain except Greece.

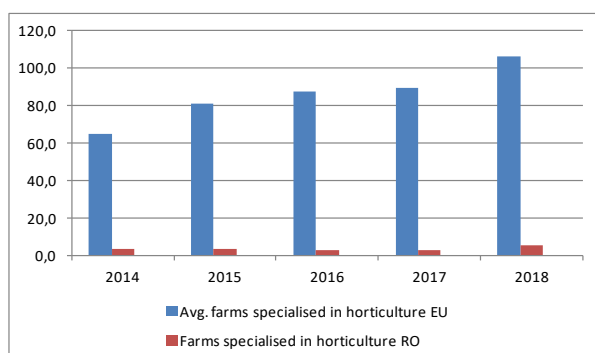


Fig. 2. Net added value of the farm (thousand euros), at the level of the EU and Romania average  
 Source: calculations based on FADN, 2021.

In Figure 2 one can notice the huge difference between the Romanian average horticultural net added value and the average net added value at the EU level, showing extremely poor competitiveness of the Romanian horticultural farms compared with the EU average.

#### Net added value per annual unit of work

The FNVA per AWU of farms specialising in horticulture is among the highest compared to other sectors.

Figure 3 shows that comparing the average net added value per annual unit of work calculated for Romania to the EU average, the labour productivity of the Romanian horticultural sector is very low. Small labour productivity reflects once more the low level of technology used on the Romanian horticultural farms.

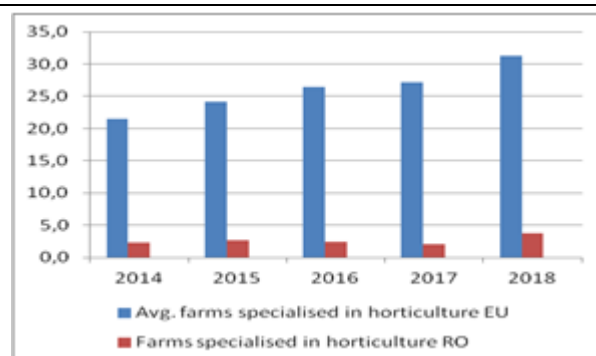


Fig. 3. Net added value per annual unit of work (thousand euros), comparison Romania - EU average  
 Source: calculations based on FADN, 2021.

The processing and preservation of vegetables and fruits represents a small percentage of the value added of the food sector, about 3%, below sectors such as meat and the meat processing, flour and dairy products. At the level of agriculture, the share is also relatively low, below 3%, and the FNVA/AWU of the horticultural sector is extremely low compared to EU countries (both old and new, Figure 1). The distribution of value added by supply chain is unbalanced mainly due to the lack of price transparency in the market and a low level of contracting.

Although the supply of vegetables is quite diverse, it has a rather low added value, mainly due to the poor organization of producers (about 1% degree of organization compared to 45% of the EU average). The consequence of this situation leads to insufficient marketing activities including poor collection of produce. This jeopardizes the attractiveness of local horticultural products and consumer's food safety, reflecting an underdeveloped logistics and storage system.

#### Agricultural family income in Romanian horticultural sector

This indicator reveals the level of family agricultural income per unit of work. This indicator takes into account differences in the remuneration of family work. Increasing the farm income is a central objective in the Common Agricultural Policy (CAP). Farm family income has been an important indicator in the CAP and this why is recorded in FADN monitoring system.

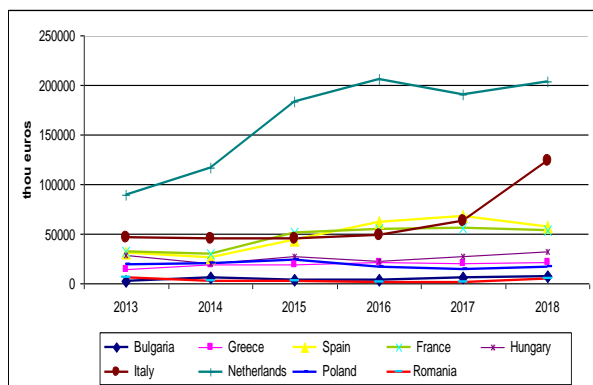


Fig. 4. Agricultural family income, thousand euros  
 Source: calculations based on FADN, 2020.

In this study it is used to check the degree of convergence of the Romanian horticultural farms with some other horticultural sectors from the EU. The farm income aggregates do not represent the disposable income of farm households, because the latter, in addition to their purely agricultural incomes, may also have income from other sources (non agricultural activities, salary, social remuneration, income from different assets ownership)

The viability of the farm analyzed through the agricultural family income indicator calculated as a ratio between the farm's net income and unpaid work at the Romanian farm reveals the lowest level compared to the countries considered in the analysis registering the lowest level in 2016, respectively 1,523 euros/person and a maximum level in 2018, respectively 3,603 euro/pers. It seems that the accession to the European Union did not have a major influence on the family agricultural income in the primary horticultural sector, our country occupying the last place among the compared countries. According to the results, the viability differences are huge between the primary horticultural sector in Romania compared to the other countries analyzed, the agricultural family income being over 60 times lower compared to the Netherlands, 6 times lower compared to Poland and 16 times lower compared with Hungary (Fig. 4).

Unfortunately, this situation is reflected at the whole agricultural sectors according to a study prepared by DG Agri and Rural Development. At the level of each country there are important variations regarding the incomes in

the old EU Member States which are in general superior to those countries which became members after 2004.

The lowest factor income levels per full-time worker can be found in Romania, Slovenia and Croatia (all below 6,000 euros/AWU per year).

At the other end of the scale, factor income per full-time worker in the Netherlands stands at euros 59,657 or more than 3 times the EU average (euros 17,846/AWU) (Fig. 5) [3].

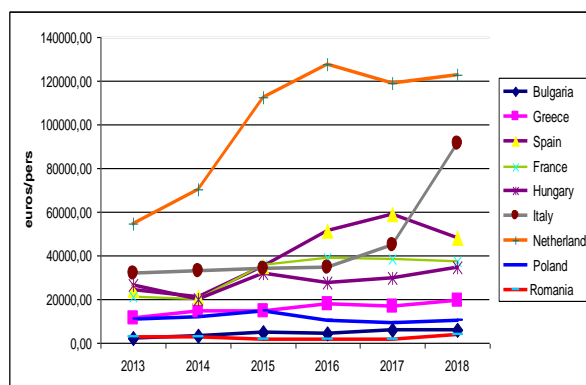


Fig. 5. Farm family income per family work unit, euros/pers  
 Source: calculations based on FADN, 2020.

The variability of income over time reflects the income risks faced by horticultural farmers especially in Romania.

The volatility of income reduces the well-being of risk-averse farmers and reduces farmers' motivation to produce, invest and innovate [3].

### The value of horticultural production

The Romanian horticultural value production decreases in the period 2013-2018 (-2%), while in the other countries, except Poland (-6%) recorded significant increases, Bulgaria (+ 88%), Spain (+ 83%). The highest value of horticultural products is recorded in the Netherlands, followed by France and Spain (Fig. 6). A high value of production is then reflected in higher productivity levels which allow constant investments in new technologies, seeds and equipments.

Among the comparator countries Romania reveals the smallest levels regarding the production value which explains the low level of profitability indicators discussed above. Low levels of production value means insufficient cash flow for new investments

especially in new technologies and also impedes a financially sustainable crop plan.

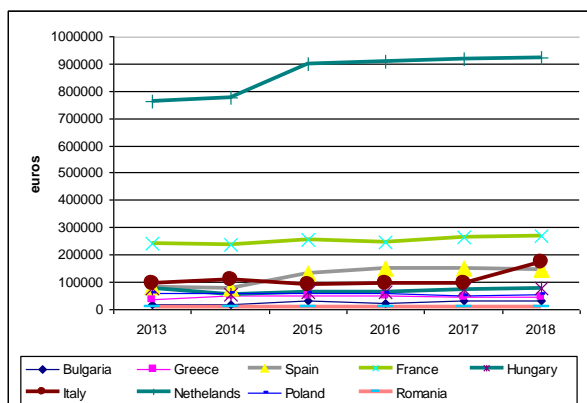


Fig. 6. Value of total production in the horticultural sector, euro

Source: calculations based on FADN, 2020.

Low levels of Romanian production value and its variability is given by the fluctuation of the prices and the volatility of the yields. Thus, Romania records 4-5 times smaller yields for cabbages and carrots and even higher yields differences in case of tomatoes when comparing with the EU average. The Romanian horticultural farmers need to generate sufficient profit from their sales to be able to cover their production costs and make new investments. With their current level of production value this still remains a key issue. One possible solution to this problem would be a more positive and proactive attitude towards creating producers groups, knowing the poor level of association within the sector at this moment.

If farmers cannot pool and sell their production, their potential profitability decreases. This highlights the danger of increasing production without a potential contract within a producer group or with a retailer. At this moment in Romania the contracting level is much reduced although it is well known that the most beneficial relationships and sustainable profits is the long-term contracting. Low level of contracting of production and the yields discrepancy when comparing with countries such as Netherlands make the profitability and convergence of this sector being far away from its competitors.

## CONCLUSIONS

The calculation of the competitiveness indicators of profitability related to the Romanian horticultural sector and the comparative analysis made with some other EU competitors reveals a low level of competitiveness for the Romanian horticultural sector. The Netherlands stands out as the most competitive country, followed by countries such as Italy, France and Spain.

The value of production is smallest compared to all the other analysed countries although there is, however, an increase in yields, which is primarily due to the increase in areas grown in greenhouses and plastic tunnels that allow the use of more productive varieties and the correct application of technologies. However, average yields remain highly volatile. The Farm family income per family work unit is also smallest in regard with comparator countries a consequence of reduced production values. This triggers low attractiveness of this activity and in some cases abandonment of this activity or a decrease of the cultivated areas. The Net added value per annual unit of work records the smallest value in Romania, showing again a poor profitability amongst all comparator countries, a consequence among others of a poor infrastructure and weak level of organization. Other explanation apart from the causes already listed is found in the poor functioning of the supply chain and low level of contracting.

The increase of cultivated areas in greenhouses and plastic tunnels will allow the increase of yields per hectare by using selected seeds, with high productive potential but also the correct application of technologies including the purchase of equipment, logistics, and new storage systems.

Although the supply of horticultural products is relatively diversified, the added value of the products is small, mainly due to the lack of marketing knowledge meant to ensure attractiveness and safety in front of the consumer, the lack of technical means of sorting, packaging, labeling, storage and transport production to the market, as well as

the lack of a system for planning production and adapting it to market requirements. This situation leads many times to poor collection of produce and as a consequence a small value of production.

Although the horticulture is the EU's fastest growing agricultural sector after important European production grows in recent years, it seems that Romanian horticultural sector remains far from a close convergence with the other horticultural sector in the EU. Similar conclusion was drawn by other authors, in countries like Egypt, where the horticultural sector is at risk of remaining behind with its competitiveness with a subsequent loss in income and jobs for a great number of rural families [4].

The policy of this sector must respond to market demands by reducing price fluctuations and the imbalance between supply and demand and encouraging the consumption of fruit and vegetables, while ensuring the competitiveness of products. Supporting local production through coherent legislative measures, facilitating access to European funds, creating an organized supply chain (by supporting the formation of producer groups) could significantly contribute to the development of the horticultural sector in Romania.

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