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# THE EFFICIENCY OF THE ROMANIAN HORTICULTURAL SECTOR IN COMPARISONS WITH OTHER EU COUNTRIES

CORNELIA ALBOIU<sup>1</sup>

**Abstract:** *The purpose of the paper is to analyze the competitiveness of the Romanian horticultural sector in terms of production efficiency, using a few specific indicators such as land productivity, labour productivity, and share of costs in production. These indicators have been calculated on the basis of FADN (Farm Accountancy Data Network) at the level of other EU member states as well, to compare these with the Romanian horticultural sector. The results reveal a low efficiency of production in Romania as against the other investigated country, which denotes a reduced impact of CAP measures in the horticultural sector from Romania, a poorly organized chain and quite a low horticultural production integration in the food chain. Therefore, Romania's integration into the EU structures and the implementation of all CAP measures in this sector has not had the expected effect yet.*

**Keywords:** *horticultural sector, competitiveness indicators, CAP*

**JEL Classification:** *Q10, Q19.*

## INTRODUCTION

At present, there are numerous concerns with regard to the assessment of horticultural sector competitiveness, due to the Common Agricultural Policy (CAP) measures in the first place, as it is desired to observe their impact on total productions, yields and farmers' incomes. The scientific approach is also necessary in order to improve domestic supply and meet consumers' needs. These objectives can be reached by improving production efficiency and increasing the competitiveness of the sector. The horticultural sector is currently facing supply (production) instability and high volatility of prices, while the inability to provide the raw material needed for the processing factories further emphasizes the need to ensure a stable vegetable supply, and mainly to find solutions to improve the use of factors that contribute to competitiveness growth such as the functioning of the chain, application of inputs, technical progress, under the background of quite a low capitalization level of the sector and a domestic production still far to meet the consumption needs of the population and possibly creating a competitive producer status within Europe. At the same time, the precarious organization of the chain, the small number of producer groups and organizations in the sector contribute to maintain a low competitiveness level of the sector.

## MATERIALS AND METHODS

### Literature review

Competitiveness can be analyzed both in national or international context, through analyses at sector level. The competitiveness of a sector is reflected in its profitability and ability to stay on the domestic market and/or the export markets. Latruffe (2010) defines the competitiveness by using several categories of factors: i) actual production and commercial characteristics (competitiveness is measured by production trends and evolution, export or import indices, comparative advantage indices, etc.) and ii) strategic management referring to business structure and strategy (competitiveness is measured through indicators referring to costs, profitability/viability, productivity and efficiency). So far, there is no generally accepted definition of competitiveness measurement, so that comparative analyses and case studies can complement the analysis of competitiveness.

In other authors' opinion, e.g. Capalbo et al. (1998), Tasevska and Rabinowicz (2014), competitiveness should be rather measured at the level of primary production than at the level of the sector. On the other hand, certain authors consider that measuring the competitiveness of a nation or

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sector is meaningless, and it is individual competitiveness (firms or farms) that matters (for instance, Brinkman, 1987, Krugman, 1994, Harrison and Kennedy, 1997). At the same time, Brinkman (1987) considers, on the basis of research results, that government's intervention can superficially change competitiveness, without increasing real competitiveness. The author explains that in the cases when competitiveness is "bought" by public subsidies, one can speak about false competition.

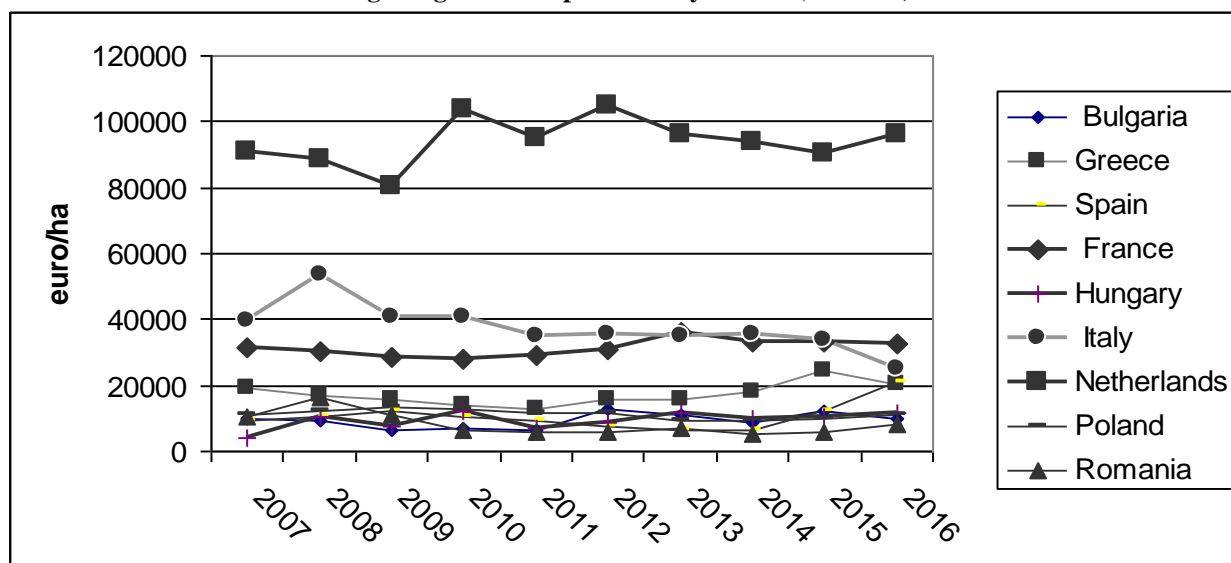
In this paper, competitiveness is analyzed at sector level in several EU member states, in order to make comparisons with Romania. More exactly, the evaluation of horticultural sector competitiveness was carried out for 7 EU member states for the period 2007-2016, for Romania inclusively, and the analysis was based on FADN (Farm Accountancy Data Network) and EUROSSTAT data. For this analysis the following indicators of production efficiency (factor productivity) have been used: land productivity (production obtained on 1 UAA ha), labour productivity (gross income of farm per annual work unit), total factor productivity.

## RESULTS AND DISCUSSIONS

### Agricultural productivity of land in Romania's horticultural sector compared to that of other EU member states

This indicator of competitiveness reveals land agricultural productivity and represents a partial productivity of the land factor. For the purpose of the analysis, comparisons were made with the following EU member states, as potential competitors in this sector: Bulgaria, Greece, Spain, France, Hungary, Italy, the Netherlands and Poland.

Fig. 1 Agricultural productivity of land (euros/ha)



Source: author's calculation based on FADN, 2018

In the case of this indicator, the results reveal that the Romanian horticultural sector has the lowest competitiveness, compared to the countries under analysis. The greatest contrast is noticeable at present, by comparison with countries such as the Netherlands (96 thousand euros/ha) and France, land productivity being 12 times lower in Romania's horticultural sector compared to the Netherlands and 4 times lower than in France.

After the accession to the EU, this indicator reached a maximum value in the year 2008, i.e. 16 thousand euros/ha, while in the year 2014 a historical minimum was noticed (5468 euros/ha). Romania's horticultural sector also has low land productivity compared to the new member states, being relatively close to that of Bulgaria, yet slightly lower, namely land productivity 1.2 times and 1.4 times lower than that of Poland and Hungary.

## Agricultural productivity of labour in the Romanian horticultural sector, comparisons with the EU

This is a competitiveness indicator that reveals the agricultural productivity of labour and represents a partial productivity of the labour factor. The calculation of this indicator allows the quantification of the labour factor to see the efficiency of production in relation to the technology used.

**Table 1.** Agricultural productivity of labour (thousand euros/ pers.)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bulgaria	6.9	8.3	7.8	6.4	6.6	7.1	7.6	8.4	9.2	8.8
Greece	25.5	24.5	23.8	24.7	22.7	20.9	21.6	27.1	25.9	24
Spain	27	30.3	33.2	34.5	29.2	31.5	32.7	34.3	39.1	47.9
France	57.4	56.8	57.4	61.4	60.1	66.5	66.6	67.1	72.5	70.6
Hungary	24.3	26.8	20.9	27.5	25	28.6	30.1	26.3	31.1	33.4
Italy	51.6	56.7	59.5	58.2	54.4	55.3	53.9	60.6	60.5	51.9
Netherlands	117.8	121.1	121.4	141.4	132.5	137.2	140.4	139.7	144	146.5
Poland	20.3	21.5	19.7	20.6	19.1	21.2	21.3	21.6	24.2	21.2
Romania	6.2	9	5.7	7.6	6.2	5.5	7.6	6.4	5.6	6.7

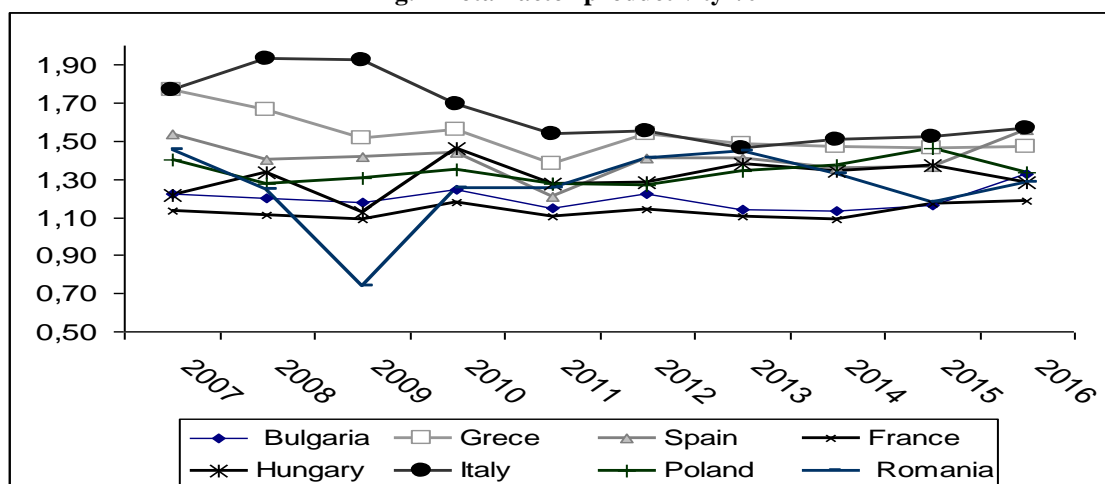
Source: author's calculation based on FADN, 2018

The results reveal that in the case of this indicator, the Romanian horticultural sector also has the lowest competitiveness level, with a minimum value in the year 2016, i.e. 5675 thousand euros/pers. The Netherlands stands out as the most productive and competitive country in terms of this indicator, too (with 144 thousand euros/pers.), followed by France (72 thousand euros/pers.) and Italy (60 thousand euros/pers.). In the case of the new member states under analysis, the results also show that labour productivity in the Romanian horticultural sector has the lowest level, 4.2 times lower than in Poland, 5.5 times lower than in Hungary and 1.6 times lower than in Bulgaria.

### Total factor productivity

Agricultural productivity is a measure of performance that reveals farm ability to increase production using fewer agricultural inputs. Agriculture productivity can be measured as ratio of the aggregated value of total production to the inputs used for production and partially, by relating the total production value to the value of a certain considered type of input (such as labour, capital, etc.) used in the production process. In this paper, the total productivity of factors in the horticultural sector is calculated for Romania and a few competitors from the EU in the period 2007-2016, also using FADN data. The total factor productivity index (TFPI) was calculated as ratio of total production value to the value of agricultural inputs used on the farm in the horticultural sector.

**Fig. 2** Total factor productivity %



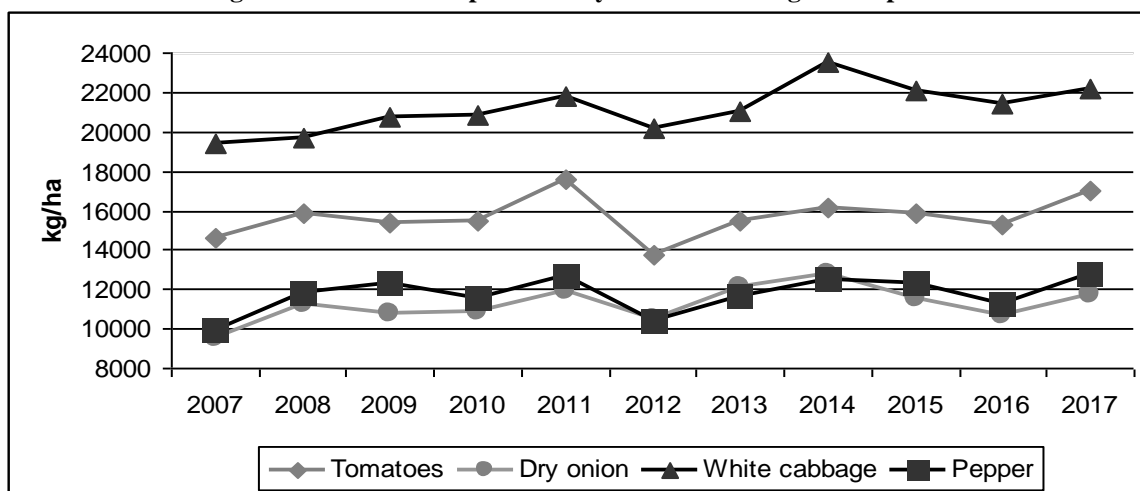
Source: author's calculation based on FADN, 2018

Figure 2 presents TFP for Romania and selected competitors among EU countries, in the period 2007-2016. According to the analysis, TFP had the lowest level in Romania in the year 2009, which suggests the existence of high input costs in relation to the value of production. In Romania, the obtained horticultural production value was 1.36 times lower than the necessary costs. Throughout the investigated period, a great variation of factor productivity in our country could be noticed, which can be explained by the variation of yields and production value (see Table 2), mainly due to weather conditions. Hungary and Bulgaria followed similar trends in TFP. Italy and Greece seem to be the countries operating on the highest total factor productivity curve. Compared to the other investigated countries, Romania's disadvantages are related to the variability of weather conditions that result in highly volatile yields, high labour and agricultural input costs. Large capital investments may be one of the reasons why countries like France and the Netherlands operate at low levels of total factor productivity.

### Average yields per hectare

The evolution of average yields is volatile, mainly due to the variation of weather conditions. The average yields per hectare in the period 2007-2016 are presented in Figure 3. Thus, in droughty years, yields have decreased, while in the normal years in terms of weather conditions, yields have had slightly increasing trends.

**Fig. 3 The evolution of productivity for the main vegetable species**



Source: tempo on line, INS, 2018

A slightly increasing trend in yields could be noticed for the main types of vegetables in the recent years, as a consequence of the increase of areas cultivated under greenhouses and solariums. The economic efficiency and the average yields per hectare in the vegetable farming sector depend on the weather conditions, on the technology used and on the way of getting adapted to the market. The volatility determined by the variation of weather conditions in recent years has been added to the lack of labour force, as well as to organizational difficulties in relation to production sale, which do not allow to obtain sufficient incomes to make capital investments like equipment and modern technologies, as well as to use quality inputs that contribute to the increase of average productivity.

### Share of costs in total production

This indicator reveals the competitive position of horticultural farms without taking into consideration the subsidies (and taxes). It is calculated as ratio of total costs to total production. Total costs have been calculated as sum of specific costs, general costs, factor costs (land, labour, capital) and occasional costs (for instance, depreciation + external factors). The lower their share, the more productive the sector can be considered.

**Table 2. Share of costs in total production %**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bulgaria	78%	81%	91%	100%	95%	96%	101%	89%	95%	90%
Greece	57%	60%	66%	64%	72%	65%	67%	68%	69%	68%
Spain	65%	71%	70%	69%	83%	71%	71%	74%	73%	64%
France	88%	90%	92%	85%	91%	88%	91%	92%	86%	85%
Hungary	82%	75%	89%	68%	78%	78%	73%	75%	73%	78%
Italy	57%	52%	52%	59%	65%	64%	68%	66%	66%	64%
Netherlands	91%	97%	99%	90%	95%	91%	91%	89%	84%	83%
Poland	71%	78%	76%	74%	78%	79%	74%	73%	68%	75%
Romania	69%	80%	135%	80%	80%	71%	53%	75%	85%	78%

Source: author's calculation based on FADN, 2018

## CONCLUSIONS

The calculation of competitiveness indicators referring to production efficiency in the Romanian horticultural sector reveals a low competitiveness level compared to all the other EU countries considered to be competitive in this sector. The Netherlands stands out as the most competitive country, followed by Italy, France and Spain. The impact of CAP measures on Romania's horticultural sector has been relatively modest, and the support received has not led to an improvement of the situation, mainly as the support to horticultural farms lacked consistency. The slightly higher yields in the recent years are mainly due to the increase of cultivated areas under greenhouses and solariums that allow the use of more productive varieties and the correct application of technologies. On the other hand, the value of obtained production is relatively modest, due to price and yield volatility and to the weak organization of the chain. The weak organization of the chain is perhaps one of the consequences of the low promotion and access level as well as of the way of thinking of the rural development programs so far. All these causes lead to a low competitiveness level of the sector, as revealed by the low values of competitiveness indicators calculated in the paper.

The increase of land areas cultivated under greenhouses and plastic tunnels could lead to the increase of average yields per hectare through the use of selected seeds, with high productive potential, as well as the correct application of technologies, including the procurement of equipment, logistics, new storage systems, which could result in the increase of sector competitiveness.

Although the supply of horticultural products is relatively diversified, the value added of products is low, mainly due to the lack of marketing knowledge and skills meant to ensure the necessary attractiveness and safety for consumers, to the lack of technical means for production sorting, packaging, storage and transport to the market, as well as to the absence of a system for production planning and its adaptation to the market requirements.

The policy of this sector must respond to the market exigencies through the diminution of price fluctuations and of the imbalance between supply and demand and to encourage the consumption of fruit and vegetables, while ensuring product competitiveness. The support to local production through coherent legislative measures, facilitating the access to EU funds, the creation of an organized distribution channel (through support to the creation of producer groups) could significantly contribute to the development of the horticultural sector in Romania.

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