

# Chapter 48

## Determinants of Agricultural Production in Romania: A Panel Data Approach

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### ABSTRACT

*Agriculture plays an important part in the worldwide challenges, such as sustainable development, climate change, high level of greenhouse gas emissions, food security and safety, overpopulation, social welfare, and natural resource depletion. This chapter examines a panel data approach to determine the contribution of several factors on the agricultural output in terms of value and of yield. Different regression models were established for the analysis at territorial level in Romania. Some findings suggest a negative influence of the excessive drought years on the cereals yield while a statistical relevance could not be found for the influence of the excessively rainy years. Still, further studies should be conducted on analyzing the influence of the environmental and social factors on the agricultural economic output.*

### INTRODUCTION

The factors influencing agriculture are highly relevant for decision making in terms of their wide implications for food security and safety, sustainable management of natural resources, and climate change. While the global population is continually increasing, policy makers try to identify ways of ensuring food security and safety by investigating the relationship between agricultural inputs and outputs (Burja, 2012; Teryomenko, 2008). The liberalization of trade has increased competition on local markets and has required more attention given to production costs, resource management, farm size, agricultural policies. Despite increased competition, the trade liberalization could contribute to diminishing the degradation of natural capital by internalizing its effects on production (Lopez, 1994).

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Moreover, climate change impacts the agriculture and the land use and, consequently, policies regulate new sustainable agricultural practices. Several studies have indicated the positive effects of climate change on agriculture, such as extension of the arable area to the North, introduction of new crop species; negative effects have also been documented such as increase in temperature and extreme weather events (Vijayasathiy & Ashok, 2015; Olesen, 2006). Hence, analyses of agricultural determinants are explored by a vast literature which will be thoroughly discussed in the literature review section of this paper.

It becomes increasingly necessary to continually analyze the factors influencing agricultural production in order to better understand their impact on agricultural outputs. The impact of agricultural activities on environment and social dimensions should be considered. As a result, new sustainable strategies and practices might emerge.

The objective of the paper is to explore the relationships between the agricultural determinants and outputs in general, as well as, the cereals' ones in particular. The authors argue that economic and social indicators, technical and material capital, financial support, human capital, natural resources, climate variability represent the main determinants of agricultural output.

The main questions that underpin this research are: Which are the main drivers of the Romanian agricultural output? Which are the main influences of the agricultural output's drivers at territorial level in Romania?

To the best of authors knowledge, few studies focus on discussing the influencing factors of the Romanian agricultural output from an econometric point of view. Unlike previous studies, which focused on more specific relationships with fewer variables, this paper undertakes an overview of the Romanian agriculture sector over 1997-2014 periods. Hence, improved understanding of this subject will hopefully lead to identifying the directions for increasing the agricultural output.

## **BACKGROUND**

The gross value added of agriculture, forestry and fishing represented 1.7% of the EU total gross value added while in Romania this indicator reached the EU peak of 6.4% of total gross value added in 2013 (Eurostat, 2016). The employment level is 2.75 million Romanian persons occupied in this sector in 2013 and 2.5 million persons self-employed – the highest in the EU – reaching to a share of 24.16% in 2013 (Eurostat, 2016).

In addition, food security and safety is a more and more discussed issue all over the world. In simplistic definitions, food security refers at assuring the necessary quantity of food for the population while food safety refers at assuring the so needed quality of food. It is interesting to emphasize the existence, in general, of enough food available for the population, still the lack of its quality and the access to it raise many problems. By access, the specialists refer mainly to the affordability (Hazell & Wood, 2008), to *the access to sufficient, affordable and nutritious food* (European Commission, 2016a). Still, by solving the problem of assuring food security by providing for the population enough money to afford the healthy and the necessary food, it might arise:

Income increases => land conversion for cultivation => overconsumption => overpopulation => environmental issues (natural resource depletion, loss of biodiversity, agricultural and food waste, pollution) => climate change (social, economic and environmental problems).

The climate change has intensified since the industrial revolution when fossil fuels started to be intensively used in all sectors of economy and pollution started to increase drastically. It is a worldwide

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