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IMPACT OF THE COMMON AGRICULTURAL POLICY FUNDS ON THE DEVELOPMENT OF THE AGRICULTURAL SECTOR, CASE STUDY ROMANIA – BULGARIA

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Abstract
Romania and Bulgaria are the only European Union member countries for which there was only one treaty upon accession. Thus, joining at the same time, we can consider that the starting point was common, since 2007 projects from European structural and investment funds have been attracted and implemented. The present research aims to identify the implications that European funds granted under the Common Agricultural Policy have had on the two agricultural sectors in the Romania-Bulgaria comparative analysis. For this purpose, data from European and international databases on European structural and investment funds attracted will be used, as well as result indicators that will measure the performance and competitiveness of the agricultural sectors.
Keywords: Common Agricultural Policy (CAP), Impact, Romania, Bulgaria, Subsidies, Rural Development
JEL: Q18, Q14

Introduction

The Common Agricultural Policy (CAP) is an important framework that has had a significant impact on the agricultural sector in the European Union (EU), including Romania and Bulgaria. (Shahbaz et al., 2011) The main instruments of the CAP, the European Agricultural Guarantee Fund (EAGF) and the European Agricultural and Rural Development Fund (EAFRD), play a crucial role in shaping the development of the agricultural industry in both countries (Beltrán & Gosálvez, 2022), (Tarditi, 1987).
The CAP has had a range of positive and negative effects on resource allocation, income distribution, and environmental outcomes. While the policy has supported the growth of agricultural production, it has also been criticized for its uneven distribution of support, often favoring larger producers over small and medium-sized farmers. The structural policies of the CAP also fail to address the unique regional

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challenges faced by Mediterranean countries such as Italy, whose agricultural landscapes share similarities with Romania and Bulgaria (Bedington, 2011).
Recent developments in the CAP, such as a greater focus on environmental sustainability and support for precision farming technologies, have the potential to address some of these imbalances (Balafoutis et al., 2017). However, national policies and public investments in areas such as agricultural research and extension services are also crucial to ensure a balanced development of the agricultural sectors in these countries.
Combining the CAP with other EU financing instruments, such as those related to the bioeconomy and circular economy, could also create new opportunities for farmers to diversify their businesses and reduce risks. Overall, the impact of the Common Agricultural Policy on agricultural development in Romania and Bulgaria is a complex and multifaceted issue that requires a nuanced understanding of the interaction of the policy with national and regional factors.
The aim of this study is to determine the impact of European funds awarded under the Common Agricultural Policy on the agricultural sectors of Romania and Bulgaria through a comparative analysis of these two countries.

Literature review
The Common Agricultural Policy (CAP) is one of the most significant instruments of the European Union, aimed at supporting rural development, ensuring a decent income for farmers and stabilizing agricultural markets. In the context of the eastward enlargement of the European Union, Romania and Bulgaria have become beneficiaries of CAP funds, which has brought notable changes in the agricultural sector of both countries (Puzić et al., 2014).

Economic Development
In Romania and Bulgaria, CAP funds have had a significant impact on the modernization of agriculture. Access to direct payments and rural development programs has allowed farmers to invest in modern technologies, improve agricultural infrastructure and increase competitiveness. According to a report by the European Commission (2020), approximately €7.5 billion was allocated to Romania and €2.9 billion to Bulgaria through the CAP in the period 2014 – 2020 (Inforegio – €8.2 billion for jobs and improved quality of life in all regions of Romania, 2015).
However, the economic impact was not uniform. In Romania, CAP funds mainly favored large farms, while small and subsistence farms benefited less. This led to economic polarization in the agricultural sector. In Bulgaria, investments were targeted more equitably, but problems of corruption and bureaucratization limited the efficient use of funds (Mocanu et al., 2020).

Social Impact

CAP funds have also contributed to improving the quality of life in rural areas by creating jobs and developing local infrastructure. Rural development programs have funded projects to upgrade roads, access to basic services and promote rural tourism (Manea et al., 2013).

In Romania, however, rural-urban migration and emigration continued to be major challenges. Young people have been reluctant to stay in the agricultural sector, despite available funding, due to limited career development prospects and low incomes. In Bulgaria, CAP initiatives have been more successful in stimulating youth employment in agriculture due to dedicated support programs (Aleksiev, 2020).

Environmental Sustainability

Another important aspect of the CAP is the promotion of sustainable agriculture. CAP funds have supported the implementation of organic farming practices such as crop rotation, conservation agriculture and the use of renewable resources. In both countries, funds for agri-environment and climate measures have been key to reducing the negative environmental impacts of agriculture.

In Romania, however, the uptake of these measures has been uneven, with better implementation in more developed regions. In Bulgaria, environmental programs have been implemented more systematically, but have encountered difficulties due to lack of knowledge and farmers' resistance to change (Džakula et al., 2022).

Materials and methods

In order to determine the purpose of the paper, data from the Eurostat database on the funds attracted through the two pillars of the Common Agricultural Policy, namely the European Commission's financial reports, as well as data on the value of agricultural production (divided by sectors) and gross value added were used.

These data were analyzed quantitatively, in terms of dynamics, and subsequently covariance analysis was determined in order to identify the links between variables and correlation coefficients to determine the intensity of these links.

Results and discussions

The aim of this paper was to determine the implications that the value of the European Structural and Investment Funds of the Common Agricultural Policy may have on the development of the agricultural sector in the Romania – Bulgaria parallel analysis. Thus, in the first part of the research, the values attracted by the two countries under the two pillars of the CAP, namely market measures through direct support and rural development, were analyzed.

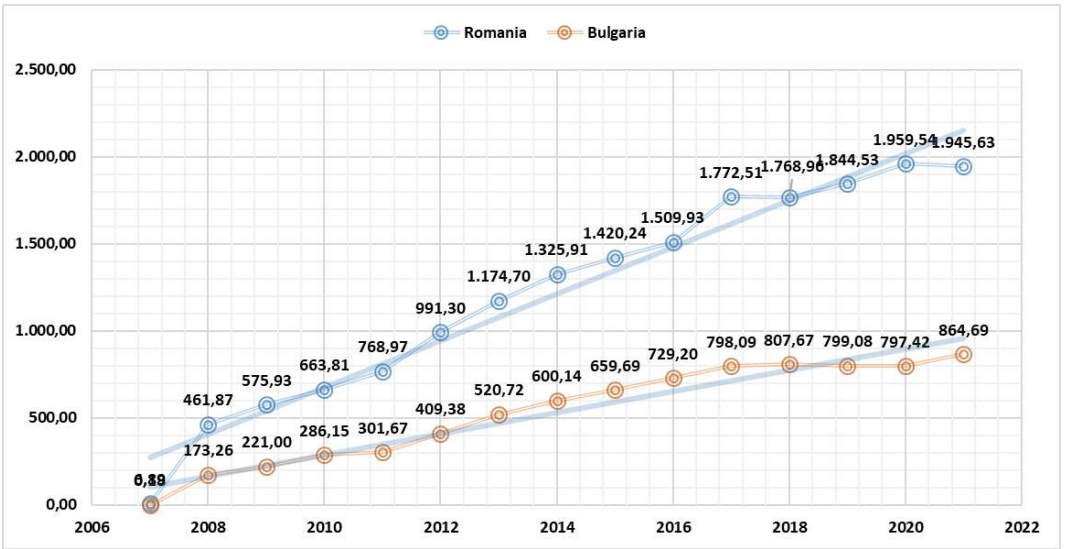


Figure 1. Dynamics of funds attracted through EAGF, Romania – Bulgaria, million euro

Source: data processing available from General Directorate for Agriculture and Rural Development, FINANCIAL REPORT

Analyzing the support received by Romania since its accession to the EU, until 2021, it can be seen that the direct support for market measures has increased significantly, from €6.9 million in 2007 to approximately €2 billion in recent years, with the maximum being reached in 2020 when the support through the European Agricultural Guarantee Fund (EAGF) was €1.96 billion.

As for the support for Bulgaria from the EAGF, in the year of accession it amounted to €180 thousand, subsequently increasing to the last year's peak of €864.7 million.

By analyzing the statistical indicators for the two countries, it can be determined that on average, Romania has registered funds of EUR 1.2 billion annually, compared to Bulgaria, which has registered on average EUR 531.2 million annually. To a large extent, this difference is also explained by the number of applications submitted and the total agricultural area of beneficiaries, the agricultural area in Bulgaria being smaller.

Calculating the deviation from this average, Romania had an average annual deviation of €611 million and Bulgaria a deviation of €279 million, leading to high coefficients of variation, given the rather high year-on-year increase, with coefficients of variation of 50% (Romania) and 52% (Bulgaria).

On average, even though the amount of funds in Romania was higher, the average annual growth rate was faster for Bulgaria, with higher year-on-year growth compared to Romania.

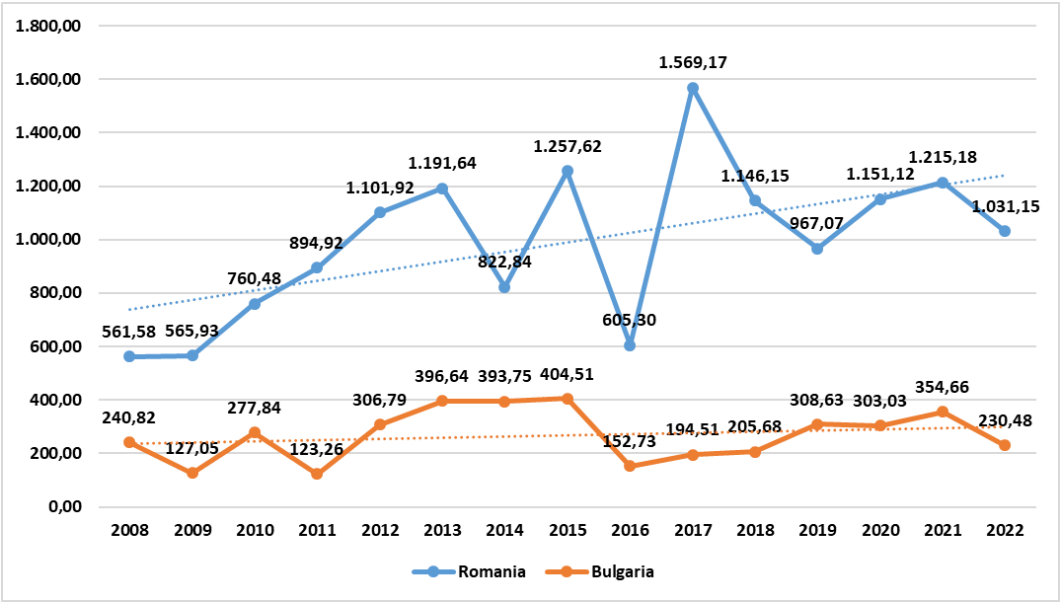


Figure 2. Dynamics of funds attracted through EAFRD, Romania – Bulgaria, million euro
Source: data processing available from European Commission, FINANCIAL REPORT

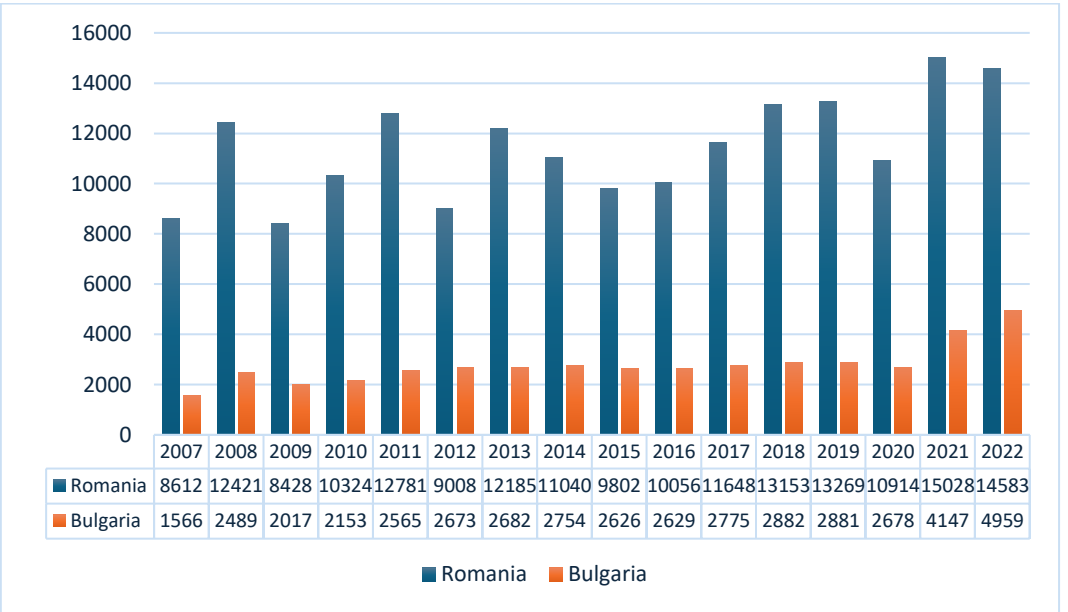
With regard to the funds attracted through the second pillar of the PAC, namely those related to rural development, it can be observed that Romania registers oscillating funds, depending on the project sessions and calls for funding measures, in 2008 being the first in which. payments were made, totaling 561 million euros, increasing to a maximum of 1.57 billion euros in 2017, and in 2022 they were just over 1 billion euros.

Regarding the funds for rural development registered by Bulgaria through the EAFRD, it can be seen that the projects in 2008 were 240 million euros, this increased to the value of 404 million euros in 2014, and this later returned to the value of 230 million euros in 2022.

These oscillations, recorded both in Romania and in Bulgaria, are given by the management of project calls related to rural development measures, as well as their access to beneficiaries.

Analyzing the statistical indicators for the two countries, the following can be determined, on average, annually Romania registered funds of 989.5 million euros, compared to Bulgaria, the latter registering on average 268 million euros annually. Calculating the deviation from this average, Romania recorded an annual deviation of 288 million euros, and Bulgaria recorded a deviation of 95 million euros, these values leading to moderate coefficients of variation, these being 29.1% (Romania) and 35.7% (Bulgaria).

Analyzing the annual rate of change, a slight increase is registered for Romania, on average the value of funds for rural development was higher from year to year by 4.4%, on the other hand in Bulgaria the average annual rate was negative or we can say that almost constant, value being –0.3%.
Next, result indicators regarding progress in the agricultural sector will be analyzed. For this were the databases related to the economic accounts in agriculture, the extraction of the data related to the value of crop production, the value of animal production, the value of the entire agricultural production, as well as the gross value added in agriculture.

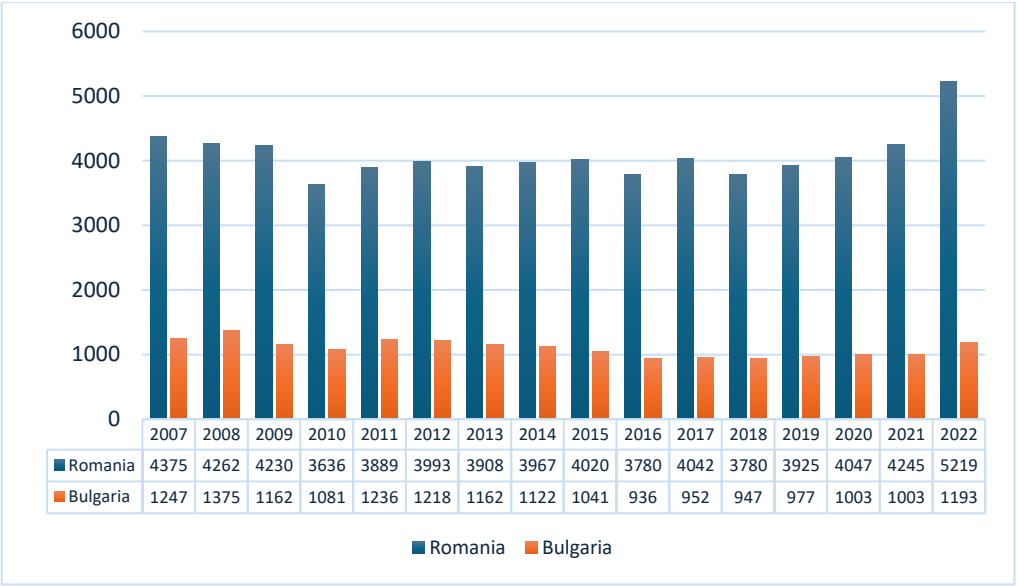


	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Romania	8612	12421	8428	10324	12781	9008	12185	11040	9802	10056	11648	13153	13269	10914	15028	14583
Bulgaria	1566	2489	2017	2153	2565	2673	2682	2754	2626	2629	2775	2882	2881	2678	4147	4959

Figure 3. Value of crop production, million euros

Source: Eurostat data processing

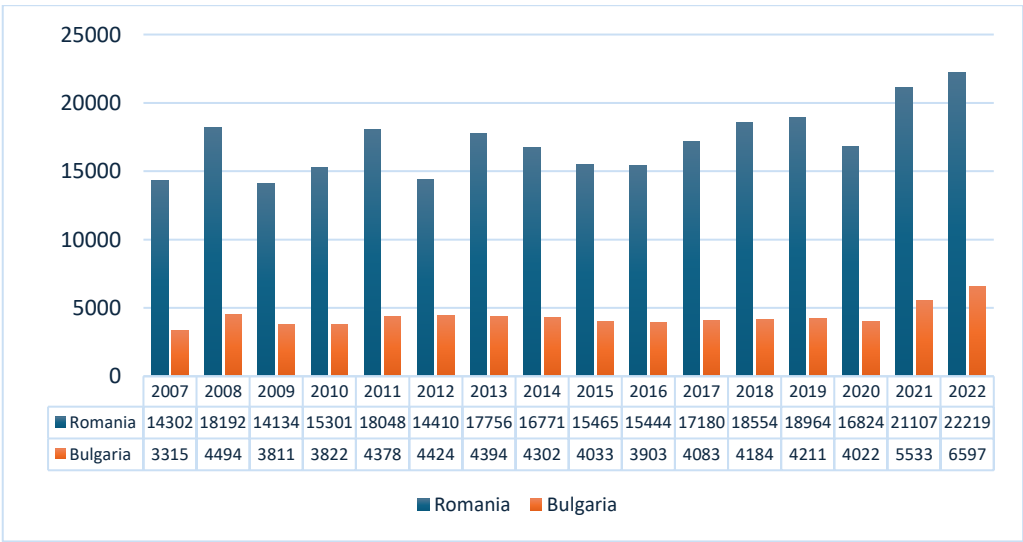
The graph illustrates the value of vegetable production in millions of euros for Romania and Bulgaria over a period of 16 years. The data show that Romania had a significantly higher vegetable production compared to Bulgaria. After a notable decrease in 2009, Romania registered a general upward trend, with a peak in 2021 at 15,028.32 million euros. In contrast, Bulgaria saw steady and moderate growth, peaking at €4,959.47 million in 2022.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Romania	4375	4262	4230	3636	3889	3993	3908	3967	4020	3780	4042	3780	3925	4047	4245	5219
Bulgaria	1247	1375	1162	1081	1236	1218	1162	1122	1041	936	952	947	977	1003	1003	1193

Figure 4. Value of livestock production, million euros
Source: Eurostat data processing

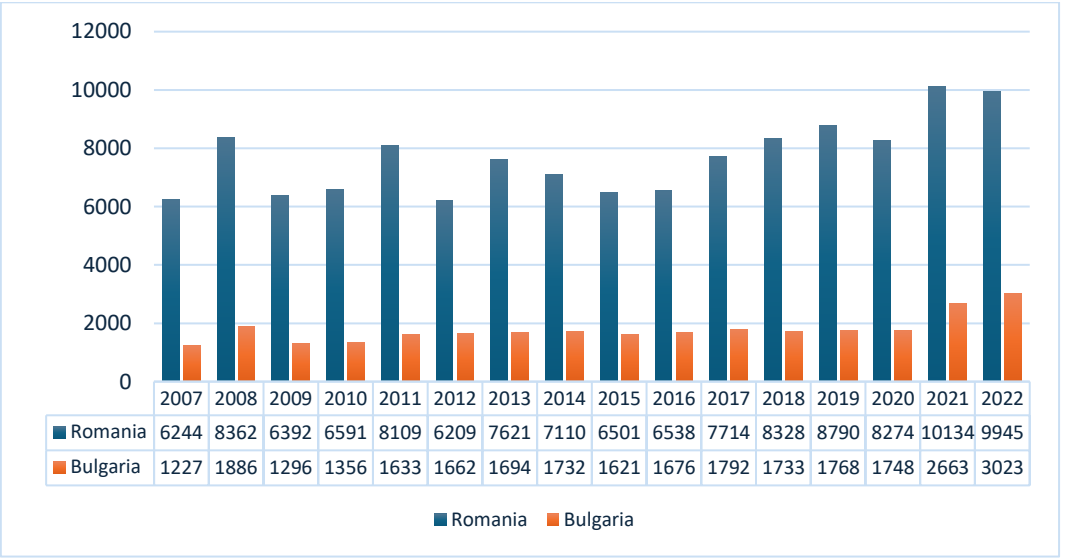
Figure 4 shows the value of livestock production in millions of euros for the same countries and period. Romania and Bulgaria had closer values compared to vegetable production. Romania maintained relatively stable values, with a slight increase in 2021 and 2022. Bulgaria had lower livestock production, with a decline around 2016, but gradually recovered by 2022.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Romania	14302	18192	14134	15301	18048	14410	17756	16771	15465	15444	17180	18554	18964	16824	21107	22219
Bulgaria	3315	4494	3811	3822	4378	4424	4394	4302	4033	3903	4083	4184	4211	4022	5533	6597

Figure 5. The value of the production of the agricultural branch, millions of euros
Source: Eurostat data processing

Figure 5 illustrates the total value of agricultural production, combining both plant and animal production. The data shows that Romania has consistently dominated, with values increasing from approximately €14,301.54 million in 2008 to €22,218.82 million in 2022. Bulgaria had a similar but more modest increase, reaching a maximum of €6,596.76 million in 2022.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Romania	6244	8362	6392	6591	8109	6209	7621	7110	6501	6538	7714	8328	8790	8274	10134	9945
Bulgaria	1227	1886	1296	1356	1633	1662	1694	1732	1621	1676	1792	1733	1768	1748	2663	3023

Figure 6. Gross added value, million euros

Source: Eurostat data processing

The final graph shows the gross value added of the agricultural sector. In Romania, gross value added varied but followed a general upward trend, with a peak in 2021 at 10,133.81 million euros. Bulgaria followed a similar trend with slow and steady growth, peaking in 2022 at €3,023.42 million.

Romania outperformed Bulgaria in all categories, reflecting a more developed and robust agricultural economy. However, there are notable fluctuations in both countries, indicating the influence of external factors such as weather conditions, agricultural policies and international markets. Overall growth in recent years suggests an improvement in the agricultural sector in both countries, but with significant differences in the magnitude of this growth.

Table 1. Analysis of the covariation between the amounts allocated to agriculture through EAFG and EAFRD and the value of agricultural production, Romania and Bulgaria

Romania	*EAFG – RO*	*EAFRD – RO*	*Crop output – RO*	*Animal output – RO*	*Output of the agricultural 'industry' – RO*	*Gross value added at basic prices – RO*
EAFG – RO	348869					
EAFRD – RO	95422	77636				
Crop output – RO	585652	148303	3853592			
Animal output – RO	–35758	4408	197689	122628		
Output of the agricultural 'industry' – RO	631562	166657	4365274	379733	5187459	
Gross value added at basic prices – RO	363272	89568	2277073	195327	2696818	1493571

(a)

Bulgaria	*EAFG – BG*	*EAFRD – BG*	*Crop output – BG*	*Animal output – BG*	*Output of the agricultural 'industry' – BG*	*Gross value added at basic prices – BG*
EAFG – BG	73066					
EAFRD – BG	6600	8568				
Crop output – BG	108916	9848	581097			
Animal output – BG	–29891	–647	–15907	16011		
Output of the agricultural 'industry' – BG	53247	6970	535850	11254	540334	
Gross value added at basic prices – BG	52503	5431	330278	–2954	313163	196398

(b)

Source: own data processing

Tables 1a and 1b highlight the covariance coefficients between funds destined for agriculture and production values for Romania and Bulgaria. In the case of Romania, we observe that there is a strong positive covariance between the EAFG – RO and EAFRD – RO funds, which indicates a close relationship between these funds. Also, there is a moderate covariance between EAFG – RO funds and crop production (Crop output – RO), as well as a high covariance between EAFG – RO funds and the output of the agricultural industry, which underlines the importance of these funds in supporting agricultural production. The moderate positive covariance between EAFG – RO and gross value added at basic prices suggests that these funds contribute significantly to the economic value added of the agricultural sector.

As for the EAFRD – RO funds, they show a strong positive covariance with both crop production and agricultural industry output, indicating a significant impact on these segments of agriculture. Crop production exhibits a very high covariance with agricultural industry output, suggesting that an increase in crop production is closely related to an increase in total agricultural industry output. There is also a high positive covariance between crop production and gross value added at basic prices, highlighting the importance of crop production in the agricultural economy.

In the case of Bulgaria, the EAFG – BG and EAFRD – BG funds show a strong positive covariance, similar to the situation in Romania, suggesting a concerted use of these funds to support agriculture. The moderate covariance between EAFG – BG funds and crop production, as well as the high covariance between EAFG – BG funds and agricultural industry output, indicate the essential role of these funds in stimulating agricultural production. The moderate positive covariance between EAFG – BG funds and gross value added at basic prices also suggests an important contribution to the economic value of agriculture.

The strong positive covariances between EAFRD – BG funds and crop production, respectively the output of the agricultural industry, underline the importance of these funds for the agricultural sector. Crop production in Bulgaria shows a very high covariance with agricultural industry output, similar to Romania, indicating that crop production is a main driver of total agricultural production.

Overall, the tables show that European agricultural funds have a significant and positive impact on agricultural production and economic value added in both countries, although there are some complex dynamics, such as negative covariances with livestock production, that require further analysis to be fully understood.

Table 2. Analysis of the correlation coefficients between the amounts allocated to agriculture through EAFG and EAFRD and the value of agricultural production, Romania and Bulgaria

Romania	*EAFG – RO*	*EAFRD – RO*	*Crop output – RO*	*Animal output – RO*	*Output of the agricultural 'industry' – RO*	*Gross value added at basic prices – RO*
EAFG-RO	1.0000					
EAFRD-RO	0.6463*	1.0000				
Crop output-RO	0.5366*	0.2830	1.0000			
Animal output-RO	–0.3071	0.0448	0.2876	1.0000		
Output of the agricultural 'industry'-RO	0.5545*	0.2689	0.9763**	0.4761	1.0000	
Gross value added at basic prices-RO	0.5550*	0.2673	0.9491**	0.4564	0.9689*	1.0000

(a)

Bulgaria	*EAFG – BG*	*EAFRD – BG*	*Crop output – BG*	*Animal output – BG*	*Output of the agricultural 'industry' – BG*	*Gross value added at basic prices – BG*
EAFG-BG	1.0000					
EAFRD-BG	0.2910	1.0000				
Crop output-BG	**0.7588***	0.1482	1.0000			
Animal output-BG	**–0.8607****	–0.0559	–0.1649	1.0000		
Output of the agricultural 'industry'-BG	0.4244	0.1064	0.9563**	0.1210	1.0000	
Gross value added at basic prices-BG	**0.6146***	0.1355	0.9777**	–0.0527	0.9613**	1.0000

(b)

*Source: own data processing, **. Correlation is significant at the 0.01 level (2-tailed).*

The tables present the correlation coefficients between the funds intended for agriculture and the production values for Romania and Bulgaria. In the case of Romania, the moderate positive correlation between EAFG – RO and EAFRD – RO (0.6463) suggests a close relationship between these funds. There is a moderate correlation between EAFG – RO and crop output (0.5366), indicating that these funds contribute significantly to crop production. Conversely, the negative correlation between EAFG – RO and animal output (–0.3071) suggests that an increase in EAFG – RO funds could be associated with a decrease in animal production.
For EAFRD – RO, the relationships are weaker, having small correlations with crop output (0.2830) and animal output (0.0448). However, there are moderate correlations with agricultural industry output (0.2689) and gross value added at basic prices (0.2673). Crop production shows a very strong correlation with agricultural industry output (0.9763) and gross value added (0.9491), underlining its major importance in the agricultural economy.
In Bulgaria, EAFG – BG has a weak correlation with EAFRD – BG (0.2910) but a moderately strong correlation with crop output (0.7588), indicating a significant contribution to crop production. The strong negative correlation between EAFG – BG and animal output (–0.8607) suggests that funds for vegetable agriculture could have a negative impact on animal production. EAFRD – BG shows very weak correlations with crop output and animal output, but a minor contribution to the agricultural economy.
Crop production in Bulgaria has a very strong correlation with agricultural industry output (0.9563) and gross value added at basic prices (0.9777), underscoring the central role of crop production in the agricultural economy. Overall, EU funds for agriculture have a significant and positive impact on agricultural production and economic value added in both countries, although there are some complex dynamics, such as negative correlations with livestock production, that require further analysis.
In both countries, European agricultural funds have a significant impact on agricultural production, especially crop production and economic value added. However, there are complex dynamics, such as negative correlations with animal production, that may require further analysis to be fully understood. The strong correlations between crop output and agricultural industry output and gross value-added underscore the central role of crop production in the agricultural economy.

Conclusions

Analyzing the dynamics of funds attracted in relation to market interventions, it can be seen that they fluctuated quite a lot, in the analyzed period, for both states, the coefficients of variation being over 50%. This can also be seen from the fairly consistent growth of these funds. On average, even if the value of the funds in Romania was higher, the average annual growth rate was more alert for Bulgaria, which recorded higher values from year to year compared to Romania.

With regard to the funds attracted for rural development, they did not grow at the same rate as the funds for market interventions, and oscillations were also recorded. These oscillations, recorded both in Romania and in Bulgaria, are given by the management of project calls related to rural development measures, as well as their access by the beneficiaries.

Regarding the analysis of the value of agricultural production, there are explainable differences between the two countries, considering the difference in the areas and implicitly the total productions between these countries, but analyzing at an equivalent unit of measure, the value of agricultural production is very similar between the two states.

Analyzing the correlation coefficients for Romania, it can be found that there is an extremely high coefficient between the value of the agricultural industry and the value of crop production, which determines the fact that the value of the production obtained from the large crop contributes significantly to the value of the production of the agricultural branch. At the same time, average coefficients are observed in terms of intensity between the value of the funds attracted through the first pillar of the CAP and the value of agricultural production, both of entire branches and the gross added value, considering the fact that subsidies are a direct influence on income from surface exploitation. Even if it is a low-intensity relationship, it should be noted that the relationship between the funds intended for market measures are inversely proportional to the value of livestock production, thus these measures do not contribute to this sector, or even make it difficult.

A similar situation is recorded in Bulgaria, but the intensity of the links is even stronger, there is a closer relationship between the value of subsidies and the value of total agricultural production, which, as in the case of Romania, is based on large crops. And in this case, a negative relationship is observed between the amount of support through the first pillar of the CAP and the amount of livestock production.

Regarding the limits of the research, it can be appreciated that the data used were made at the national and total level, the comparisons being less highlighted, units of measurement related to a surface unit or an animal unit can be considered, but these units of measurement it would not have allowed as well to determine the correlation coefficients with the amount of support within the two pillars of the CAP.

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