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## **FINANCIAL PLANE FOR THE PUBLIC ADMINISTRATION OF THE EU AGRO SECTOR**

**Abstract.** Agriculture is vitally important for the surviving and successful functioning of the whole humanity and every single human being. Approximately 42% of the world's population depends on agriculture for its livelihood. Agriculture is an important sector for the European economy as it provides livelihoods for 10.5 million farms across the EU and 44 million jobs in the entire agrifood sector. The Common Agricultural Policy (CAP) of the European Union (EU) is one of the world's largest agricultural policies and the EU's longest-prevailing one. **The purpose of the research.** Taking into account the vital importance of agriculture and the changeability of the EU payments to the agro producers, the following goals have been set while writing the presented article – to research the financial plane for the public administration of the EU agro sector and to assess its effectiveness through the analysis of the EU27 agricultural output in terms of its dynamics, differences if compared to the previous periods, trend line and projection made for the following two years. **Methodology.** To achieve the aims of the research, different methods, tools and techniques of the scientific research have been used, including the empirical analysis, the univariate analysis, the comparative analysis, the method of trends as well as data visualization tools like bar charts to make the data analysis more demonstrative and easy to make conclusions on. The data analysed are the value of the EU27 agricultural output at basic price in mln EUR. The time frame under analysis is ten years – from 2012 to 2021 included. **Scientific novelty.** The scientific novelty of the conducted research presented in the given paper lies in attempt to assess the public administration of the EU agricultural sector effectiveness through the analysis for the EU27 agro output in terms of its dynamics, differences if compared to the previous periods, trend line and projection made for the following two years. **Conclusions.** Starting from the year 2017 the EU27 agro output dynamics has an upward direction, with the only exception in 2020 as the probable impact of the Covid-19 pandemic, testifying to the right change of the EU agro sector public administration, having had positive consequences on the EU27 agro output value with the positive perspectives under the conditions unchanged. The research presented in the article and its results could be interesting and useful for the public administrators of all the levels, policy and decision makers, company employees engaged into agriculture and international trade, academic community representatives as well as beginners and experienced data analysts.

**Key words:** public administration, agricultural output, financial plane, the EU, CAP/

## **ФІНАНСОВА ПЛОЩИНА ПУБЛІЧНОГО УПРАВЛІННЯ АГРО СЕКТОРОМ ЄС**

**Анотація.** Сільськогосподарство є життєво важливим для виживання та успішного функціонування всього людства та кожної окремої людини. Існування приблизно 42% населення світу залежить від сільського господарства. Сільське господарство є важливим сектором європейської економіки, оскільки воно забезпечує засоби до існування 10,5 мільйонам ферм у всьому ЄС та 44 мільйони робочих місць у всьому агро – продовольчому секторі. Спільна сільськогосподарська політика (ССП) Європейського Союзу (ЄС) є однією з найбільших за обсягом сільськогосподарських політик у світі та найдовшою за тривалістю в ЄС. **Мета дослідження.** Беручи до уваги життєву важливість сільського господарства та мінливість виплат ЄС виробникам аграрної продукції, під

час написання представленої статті були поставлені наступні цілі – дослідити фінансову площину публічного управління аграрним сектором ЄС та оцінити його ефективність шляхом аналізу сільськогосподарського виробництва ЄС-27 з точки зору його динаміки, відмінностей у порівнянні з попередніми періодами, лінії тренду та прогнозу на наступні два роки. **Методологія.** Для досягнення цілей дослідження були використані різні методи, інструменти та техніки наукового дослідження, включаючи емпіричний аналіз, однофакторний аналіз, порівняльний аналіз, метод трендів, а також інструменти візуалізації даних, такі як стовпчасті діаграми, щоб зробити аналіз даних більш демонстративним і легшим для висновків. Аналізовані дані являють собою вартість сільськогосподарської продукції ЄС-27 за базовою ціною в мільйонах євро. Досліджувані часові рамки становлять десять років – з 2012 по 2021 рік включно. **Наукова новизна.** Наукова новизна проведеного дослідження, представленого в даній статті, полягає в спробі оцінити ефективність державного управління аграрним сектором ЄС через аналіз агровиробництва ЄС-27 з точки зору його динаміки, відмінностей у порівнянні з попередніми періодами, лінії тренду, і прогноз на наступні два роки. **Висновки.** Починаючи з 2017 року динаміка сільськогосподарського виробництва ЄС-27 має висхідний напрямок, за єдиним винятком у 2020 році як ймовірний результат впливу пандемії Covid-19, що свідчить про правильні зміни у публічному управлінні агросектором ЄС, котрі мали позитивні наслідки для вартості сільськогосподарської продукції ЄС-27 з позитивними перспективами, за незмінних умов. Представлене в статті дослідження та його результати можуть бути цікавими та корисними для публічних адміністраторів усіх рівнів, політиків та осіб, які приймають рішення, працівників компаній, які займаються сільським господарством та міжнародною торгівлею, представників академічної спільноти, а також початківців та досвідчених аналітиків.

**Ключові слова:** публічне управління, виробництво сільськогосподарської продукції, фінансова площина, ЄС, ССП.

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**1. Introduction.** Agriculture itself as well as its production is vitally important for the whole world in general and every single human being in particular. Currently, approximately 42% of the world's population depends on agriculture for its livelihood, while agriculture drives the economy of most developing countries (Aznar-Sánchez et al., 2019). Traditionally, agriculture is considered as the sector that provides food and fiber; although in contemporary economies, long discussions exist on its indirect historical role, beyond the perceived traditional one (Loizou et al., 2019).

Agriculture is an important sector for the European economy as it provides livelihoods for approximately 10.5 million farms across the EU and, if the entire agrifood sector is included, 44 million jobs are dependent on the agricultural production. More than that, the EU is also the world's largest agrifood exporter, putting the region's activities and actions at the helm of the global trade (Crawford et al., 2022). The Common Agricultural Policy (CAP) of the European Union (EU) is one of the world's largest agricultural policies and the EU's longest-prevailing one. Originally focused mostly on supporting production and farm income, the CAP has progressively integrated instruments to support the environment (Pe'er et al., 2019). The successive reforms of the Common Agricultural Policy (CAP), the enlargements of the European Union (EU) and the impacts of climate change have amplified the

diversity of European agriculture as the said changes have resulted in the intensification of agricultural activities in some regions, while they have led to the marginalization of agriculture and its eventual abandonment in others (Giannakis & Bruggeman, 2015). Despite the extreme significance of agriculture for both the EU as a countries union and every EU member – state, support to agriculture in the European Union has declined gradually since the 1990s. That means, that support to producers as a share of gross farm receipts (%PSE) has stabilised at around 19% since 2010. Although support in the form of price distortions has been reduced substantially, trade protection measures (including import and export licensing, Tariff Rate Quotas (TRQs) and special safeguards) remain in effect for a number of sectors (OECD, 2020).

Taking into account the vital importance of agriculture as a whole on the one hand and the changeability of the EU payments to the agro producers on the other hand, the following goals have been set while writing the presented article, meaning to research the financial plane for the public administration of the EU agro sector and to assess its effectiveness through the analysis of the EU27 agricultural output. The data analysed are the value of the EU27 agricultural output at basic price in mln EUR. The time frame under analysis is ten years – from 2012 to 2021 included. To achieve the aims of the research, different methods, tools and techniques

of the scientific research have been used, including the empirical analysis, the univariate analysis, the comparative analysis, the method of trends as well as data visualization tools like bar charts to make the data analysis more demonstrative and easy to make conclusions on.

**2. Results and Discussion.** Agriculture is an important industry for the European Union as a whole as well as all the EU countries in particular, therefore they all receive EU funds through the Common Agricultural Policy (CAP), which support farmers directly through the European Agricultural Guarantee Fund and rural areas, climate action and the management of natural resources through the European Agricultural Fund for Rural Development (European Parliament, 2021). Approximately half of the EU funding is channelled through the 5 European structural and investment funds (ESIF), managed jointly by the European Commission and the EU country – members (European Commission, n.d.(f)). Thus, the European structural and investment funds are:

- European regional development fund (ERDF), which promotes balanced development in the different regions of the EU;
- European social fund (ESF), that aims at supporting employment-related projects throughout Europe and investing in Europe’s human capital;
- Cohesion fund (CF) funds transport and environment projects in countries where the gross national income (GNI) per inhabitant is less than 90% of the EU average;
- European agricultural fund for rural development (EAFRD) focuses on resolving the particular challenges facing EU’s rural areas;
- European maritime and fisheries fund (EMFF) helps fishermen to adopt sustainable fishing practices and coastal communities to diversify their economies, improving quality of life along European coasts (European Commission, n.d.(g)).

Consequently, the main investment areas of the European structural and investment funds are:

- jobs, growth and investment;
- digital single market;
- energy union and climate;
- internal market;
- economic and monetary union;
- justice and fundamental rights;
- migration (European Commission, n.d.(c)).

As it flows from everything stated above, the European structural and investment funds beneficiaries are as follows:

- European Regional Development Fund and Cohesion Fund;
- European Social Fund;

- European Maritime and Fisheries Fund;
- CAP payments (shared management) (European Commission, n.d.(b)).

Referring to the latter from the list, it should be explained, that, while the Commission bears overall responsibility for the financial management of the CAP, most of the CAP budget is implemented under the so-called “shared management” between the Commission and EU countries, with the remainder falling under “direct management” (European Commission, n.d.(d)). Under shared management, the EU countries are responsible for setting up a management and control system for payments that complies with EU regulations, while the Commission plays a supervisory role, ensuring that the arrangements governing the management and control system are compliant (European Commission, n.d.(e)).

All in all, the largest part of the EU Common Agricultural Policy (CAP) budget is managed and controlled through Integrated Administration and Control System (IACS) in Member States, aiming to safeguard the CAP financials and supporting the farmers. The IACS is implemented at national and regional level through the Paying Agencies of each EU Member State. In the post-2020 CAP reform, Member States will be responsible, through their Paying Agencies, for providing a Farm Sustainability Tool to their farmers (GAEC5) (FaST, n.d.). More detailed, roughly 0.8% of the CAP budget is managed directly by the European Commission (including allocations to EU delegations and EU executive agencies), meaning to be provided for:

- administrative and technical support activities required to implement the CAP, including surveys and monitoring, audit and inspection measures, and the maintenance of agricultural accounting IT systems;

– promotion activities for the EU agricultural products by international organisations, executive agencies, and the Commission itself (European Commission, n.d.(a)). To assess the practical results for the public administration of the EU agricultural economy sector, the differences of the EU27 agricultural output (at Basic Price) in Mln EUR, if compared to the previous periods, are visualized in Figure 1, being analysed afterwards.

According to the researched data visualization presented in the figure given above, there is no one clear dynamics in them through the time frame under analysis. We can even talk about the cyclicity present in the analysed data set as we observe the positive dynamics of the observations from the year 2014 to 2016 included, thus of three years long, followed by the opposite one starting



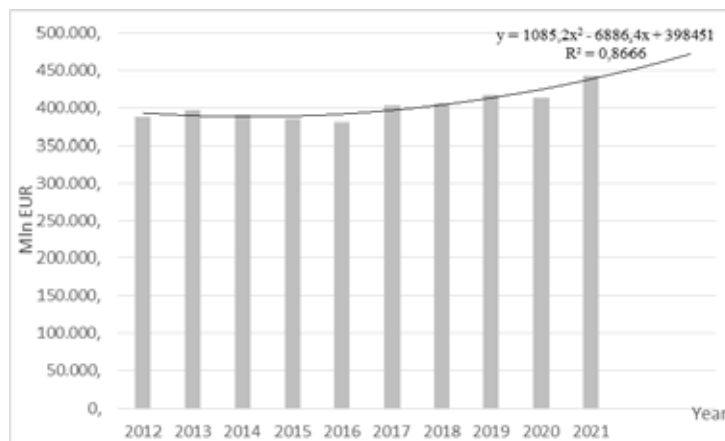
**Figure 1. Differences of the EU27 Agricultural Output (at Basic Price), Mln EUR**

Source: author's elaboration based on the data from (Eurostat, 2022(a)).

from 2017 and lasting another three years. The very fact of the similar duration for the dynamics of the opposite direction following one another could be the reason to speak about the cyclicity of the data under research. But the duration of the following two ups and downs was one year each, that, in turn, prevents one from making statements about the cyclical pattern of the analysed data set dynamics. To further analyse the data, it should be noted, that the smallest agricultural output of the EU27 value can be observed in 2016, while the biggest one – in 2021. Assessing the differences of the said output compared to the previous periods, one should note, that the smallest decrease of the mentioned output was observed in 2020, while the biggest decrease – in 2014. At the same time, the smallest increase of the EU27 agricultural output was in 2018, with the biggest increase of the mentioned output being present in 2021. In addition, the smallest value for the EU27 agricultural output could be observed

in 2016 and the biggest one – in 2021. There were different events happened in the years mentioned above, but it would be wrong to try to name one single event having caused the increase/decrease of the ago output under research as the analysed category is too complexed to be influenced by only one factor, its rather a combination of factors and events that caused the definite change of the EU agro output. To deepen the data analysis presented in the paper, the EU27 agricultural output for ten years, that is from 2012 to 2021 included, dynamics on a yearly basis and two following time periods, in this case – years, with the trend line built are visualized in Figure 2.

The visualization of the analysed data presented either in Figure 1 or 2, point to the overall changeability of the data set under research. Despite that fact, the general trend line was built for the researched data to analyse the tendency of the data dynamics during the time frame under



**Figure 2. The EU27 Agricultural Output (at Basic Price), Mln EUR**

Source: author's elaboration based on the data from (Eurostat, 2022(a)).

research as well as to make projections for the following two years. Only two periods of time, that is years, were taken for the projection making because of the number and strength of the turbulences we all are facing nowadays, influencing all the spheres of the human activity. The attempt to make projections for a longer period of time will automatically lower the said projection robustness. The trend line for the analysed data set was built with the help of the polynomial function. The mentioned function was chosen from the exponential, linear, logarithmic, polynomial and power ones. The criterion for the choice of the appropriate function was the values of the  $R^2$  coefficient. Of course, the mentioned coefficient value is only one of the criteria to pay attention when choosing the right function for trend lines building and projection making, but, in this case, this very criterion is considered the only one as the presented research is not a purely statistical one and the consideration of the other criteria would destruct us from the main goal of the research. As for the shape of the trend line, it looks downward to the year 2014 included, starting in the upward direction afterwards. The latter direction continued to be of the kind to the end of the time frame under analysis as well as during two following years, taken for the projection making. As for the projection of the EU27 agricultural output for 2022, according to the trend line visualised in the figure given above, it appears to be approximately at the same level with the one of 2021, while the said output in 2023 is considered to be bigger than that of 2021, under the circumstances unchanged.

**3. Conclusions.** Agriculture is the art and science of cultivating the soil, growing crops and raising livestock, which also includes the preparation of plant and animal products for people to use and their distribution to markets (National Geographic, n.d.). For decades European agriculture has achieved high levels of productivity growth and maintained a presence on the world market while keeping the family farm at its heart thereby fulfilling its traditional multi-functional role: to maintain economic activity and employment in rural areas (with agricultural employment as the lynch-pin), to enhance the countryside (including less favoured areas), to manage the environment and biodiversity, to conserve the landscape and its beauty (Committee of Agricultural Organisations in the European Union, 1999). For instance, the EU's agricultural industry created an estimated gross value added of EUR 189.4 billion in 2021, having contributed 1.3 % to the EU's GDP (Eurostat, 2022(b)). In addition, agricultural land accounts for almost half of the EU area, around two thirds of which is used

for arable crops, one third for permanent grassland and meadows, and the rest for permanent crops (FAO, n.d.). Agriculture therefore plays a key role, among the others, in land management and has a huge responsibility in the preservation for natural resources of the EU (European Commission, 2020).

Approximately half of the EU funding is channelled through the 5 European structural and investment funds (ESIF), managed jointly by the European Commission and the EU country – members (European Commission, n.d.(f)). The Common Agricultural Policy (CAP) of the European Union (EU) is one of the world's largest agricultural policies and the EU's longest-prevailing one (Pe'er et al., 2019). Most of the CAP budget is implemented under the so-called "shared management" between the Commission and EU countries (European Commission, n.d.(d)). The largest part of the EU Common Agricultural Policy (CAP) budget is managed and controlled through Integrated Administration and Control System (IACS) in Member States, aiming to safeguard the CAP financials and supporting the farmers (FaST, n.d.).

As for the analysis for the public administration of the EU agro sector effectiveness presented above, there is no one clear dynamics in the EU27 agro output through the time frame under analysis as the said data are rather changeable. It cannot be talked about the cyclicity of the said data dynamics because of the different duration for the data cycles mentioned above. The researched data differences assessment points to the following observations – the smallest decrease of the mentioned output was observed in 2020, while the biggest one – in 2014; the smallest increase of the EU27 agricultural output was in 2018, with the biggest increase being present in 2021. Moreover, the smallest value for the EU27 agricultural output could be observed in 2016 and the biggest one – in 2021. The trend line for the analysed data set was built with the help of the polynomial function, having been chosen from the exponential, linear, logarithmic, polynomial and power ones judging by the values of the  $R^2$  coefficient. The trend line is downward to the year 2014 included, starting in the upward direction afterwards, continuing being of the latter kind to the end of the analysed time frame as well as during the following two years taken for the projection making. So, starting from the year 2017 the EU27 agro output dynamics has an upward direction, with the only exception in 2020 as the probable impact of the Covid-19 pandemic, testifying to the right change of the right change in the EU agro sector public administration, having had positive consequences on the EU27 agro output value

with the positive perspectives under the conditions unchanged. The research presented in the article and its results could be interesting and useful for the public administrators of all the levels, policy and decision makers, company employees engaged into agriculture and international trade, academic community representatives as well as beginners and experienced data analysts.

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