OLSZTYN ECONOMIC JOURNAL
2021, 16(2), 295–306
ISSN 1897-2721 e-ISSN 2083-4675 DOI: 10.31648/oej.8213

ORIGINAL PAPER

IMPACT OF DIRECT SUBSIDIES ON BUDGETS OF AGRICULTURAL FARMS

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JEL Classification: Q01, Q14, Q18.

K e y w o r d s: production subsidies, agricultural farms.

A b s t r a c t

The article investigates the impact of direct subsidies on the budget of agricultural farms and the level of investment in the farms. A questionnaire survey was made among clients of a company which provides services in farming in Nidzicki District (powiat nidzicki). The respondents were farmers who benefit from direct subsidies to agricultural production. The research confirmed the research working hypotheses, in which the direct subsidies constitute 1/3 of the profit generated by agricultural farms and have a significant influence on the level of investment. The research aimed to determine the impact of direct subsidies on the budget of agricultural farms and their investment in fixed assets.

How to cite: Zielonka, J., Przybysz, N., Kobzhassarov, T., & Witkowska-Dąbrowska, M. (2021). Impact of Direct Subsidies on Budgets of Agricultural Farms. *Olsztyn Economic Journal*, *16*(2), 295-306. https://doi.org/10.31648/oej.8213.

WPŁYW DOPŁAT BEZPOŚREDNICH NA BUDŻETY GOSPODARSTW ROLNYCH

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S ł o w a k l u c z o w e: dopłaty do produkcji, gospodarstwa rolne.

A b s t r a k t

W pracy omówiono wpływ dopłat bezpośrednich na budżet gospodarstw rolnych oraz na poziom inwestycji w gospodarstwach. Wśród klientów firmy zajmującej się kompleksową obsługą rolnictwa na obszarze powiatu nidzickiego przeprowadzono sondaż z wykorzystaniem kwestionariusza ankiety. Respondentami byli rolnicy korzystający z dopłat bezpośrednich do produkcji rolniczej. Przeprowadzone badania pozwoliły na potwierdzenie wcześniej postawionych hipotez, według których dopłaty bezpośrednie stanowią ponad 1/3 zysku gospodarstw rolnych oraz istotnie wpływają na poziom prowadzonych inwestycji. Celem badań była identyfikacja wpływu dopłat bezpośrednich na budżety gospodarstw rolnych oraz inwestycji w środki trwałe.

Introduction

Since Poland's accession to the European Union, the Polish agriculture has made significant progress owing to the EU programmes and direct subsidies. The farming profession has ceased to be perceived as an occupation from simple, uneducated people; together with the increase in profitability, the professionalization of the industry has also risen, and farming nowadays requires broad and expert knowledge. The EU funds have helped farmers to purchase new machinery, which greatly facilitates farming work, making it easier and more gratifying; owing to the possibility of precise sowing, cultivating, and harvesting, the losses usually incurred during such activities have begun to decrease. Moreover, thanks to the development of other industries and the

general prosperity of the society as well as the opportunity to export the produce abroad, the demand for agricultural goods offered by farmers has risen, which translates into higher revenue. However, the technical facilities remain the most important issue for farmers, both at present and in the future. With the current mechanization rate and overall larger farm size, most farming cannot be carried out without agricultural machinery and equipment. Also, suitable buildings for storing the produce or rearing animals and all other facilities needed for efficient farming minimize losses and maximize profit. This is an issue which farmers give most thoughts to – would modern farming cope without direct subsidies? This is why it is vital to explore what share of the budget of a typical farm consists of direct subsidies. The objective of this research was to examine the contribution of direct subsidies into the budget of agricultural farms, and their impact of the level of investment in fixed assets. Two hypotheses were posed in this respect:

H1: Subsidies to the operational activities in farms make a substantial part of investment financing.

H2: Subsidies to the operational activities in farms constitute approximately 1/3 of their profit.

The need to support agriculture in economic theory

At the turn of the 19th and 20th centuries, economics was dominated by a neoclassical theory and its unwavering belief in "the invisible hand of the market". During the Great Depression of 1929-1933, there was a shift in these ideas and a new economic theory was created by John Maynard Keynes. The ideas he elaborated called for a combination of the market, as the basic regulator of economic processes, with an active role of the state to correct the shortcomings of the market mechanism. This marked the emergence of interventionism in various sectors of the economy. It was also the time when first concepts of support for agriculture were elaborated, as agriculture was seen as a sector particularly prone to fluctuations in the economic cycle. Another factor which made intervention in agriculture an immediate necessity was the need to rebuild its industrial potential after the Second World War (Jambor & Harvey, 2010, p. 3). To this effect, in the late 1950s and upon conclusion of the treaty establishing the European Economic Community in 1957, the principles for the Common Agricultural Policy were developed. The CAP was launched in 1962 and has been implemented in the EU since then. Although the Keynesian approach was rejected during the so-called neoliberal revolution of the 1970s and 1980s, the CAP as a type of state interventionism was in progress, both institutionally and financially. There were attempts at limiting its impact, but they were effectively overridden by the majority of the EU member states, even

when the neoliberal economic doctrine dominated the mainstream economics (Czyżewski & Stępień, 2017, p. 678).

At this point, it is worth considering what motivates the continuation of mandatory support for the agricultural sector. With regard to the liberal theory and its demand for the micro-economic rationality, we would have to assume that state and communal interventions constitute an unjustified, unique right of the food production sector, which is seen as an additional cost incurred by the society. This reasoning does not account for the fact that agricultural production is subject to specific conditions, nor does it take into consideration the agricultural factor (Czyżewski, 2007, p. 15-23). Another feature of agriculture is its heterogeneity, which follows from the properties of the production environment, for instance the soil quality in a given location, surroundings and location of farms, and their agricultural structure. Another fact attesting to agriculture's specific nature is that it does not follow the free market rules, such as a relatively large number of buyers and sellers, the freedom to enter and exit the market, and the state of perfect information about the market. Agriculture is also characterized by seasonality and cyclical performance due to the volatility of climate conditions, which impact the supply and prices of goods in the food market (Stępień, 2015). The agricultural sector is exposed to high risk, and the market mechanism is inadequate to prevent the scope of risk, which warrants a widely understood support for the sector (Czyżewski & Stępień, 2017, p. 678).

Even under free market conditions, food producers are constantly pressurized to maximize production, both its scale and specialization. This makes it more difficult to play non-commercial roles, while the market simultaneously promotes the concentration of food production in better adapted areas and the termination of production is areas with less favourable conditions for agriculture (the principle of marginal cost elimination). The liberal approach to agriculture conveniently ignores external effects, which we distinguish as negative (deprivation of weaker farms, degradation of the natural environment) and positive ones, creating the foundation for the supply of public goods. The criterion of economic effectiveness overrides all other factors; It becomes crucial to locate the capital where it can generate the highest profit, often in areas characterized by lower standards of environmental protection, animal welfare, or applied technologies. Consequently, food travels longer routes before it is delivered to the consumer. Such detachment means that the food producer is unknown, hence there is a risk that food of lower quality enters the market, which may be detrimental to people's health. In conclusion, the implementation of support systems for agriculture counteracts and perfects the market mechanisms. Support to farming is also necessary in view of economic, social, and environmental criteria (Czyżewski & Stępień, 2017, p .679).

Thendssion of Poland to the European Union has opened the local agricultural sector to many new solutions within financial support programmes. A comparison of agriculture to other industries indicates that it has the lowest profitability

of all market sectors. It is therefore crucial to seek solutions aiming at narrowing the discrepancy between the income and the volume of the capital engaged in food production versus those in the production in other sectors of the economy. The funds received from the European Union constitute a significant share of income from agricultural production, which helps to improve the standards of living in rural areas (Barczyk, 2017, p. 32). There are many instruments in the CAP which serve to achieve the objectives and assumptions of this policy. These mechanisms have been implemented to make the agricultural sector more effective through support programmes. Over the years of its operation within the EU framework, the CAP has been subject to many reforms (Tomaszewski, 2017, p. 69; Wawrzyniak, 2017, p. 40, 41; Tomczak, 2009, p. 25; Maciejczak, 2010, p. 23; Kowalski, 2017, p. 100; Zbierska & Zbierska, 2017, p. 281; Majewski & Malak-Rawlikowska, 2018, p. 13; Hardt, 2008, p. 49; Drygas & Nurzyńska, 2018, p. 61). These ongoing reforms in the operation of the Common Agricultural Policy have made it better and more responsive to the needs of farmers in the ever-changing market.

The Common Agricultural Policy has contributed to the development of agriculture and rural areas in the European Union member states. It is also the best and the most important instrument facilitating the integration processes in Europe (Kowalski, 2017, p. 111). Direct payments constituted approximately 76% of the CAP budget in the 2014-2020 perspective. However, research studies show a very uneven distribution of direct support in agriculture. For example, in Bulgaria the payments are collected mainly by large scale farms, which generates problems for smaller farms and creates a structural imbalance. The distribution of the EU funds have had an impact on the level of investment, productivity and economic effectiveness of the Bulgarian agriculture (Beluhova-Uzunova *et al.*, 2017, p. 282-287). A similar correlation with the size of farms was found by Barczyk (2017, p. 31-48).

Methodology of research

The research focused on farms in Nidzica District (powiat nidzicki), in the Province of Warmia and Mazury (województwo warmińsko-mazurskie), north-eastern Poland. The study was conducted with an anonymous survey distributed among farmers receiving direct payments, who were also clients of a company providing services for agriculture. Copies of the questionnaire were distributed as print-outs. The study assumed a minimum sample calculated from the following formula:

$$n = \frac{u^2 \cdot p(1-p)}{\mathrm{ep}^2},$$

where:

n – sample size,
u – indicator dependent on confidence level; confidence level 0.95,
ep – estimation terror assumed at 5%,
p – share of selected group in total.

On the basis of these calculations, a group of 64 respondents was selected out of 80 clients of the company. The survey was distributed between 1 April and 1 May 2022. In line with the assumptions, the answers were based on real data: applications for direct payments submitted in 2021, sums of payments granted for 2021, and, in most cases, VAT registers of income and outcome (in the case of farmers who did not register as VAT payers, the answers were based on revenues and expenses in 2021).

The analysis was performed by calculating the budgets of agricultural farms, taking into account the income, expenses and the size of investment made in 2021. The amount of direct payments received by the farm was then added to the outcome. The flow of calculations was as follows: income in 2021 – expenses in 2021 – investment in 2021, and the formula: income in 2021 – expenses in 2021 – investment in 2021 + direct payments in 2021.

An analysis was also made excluding the investment. We subtracted the expenses from the income, and, in the second variant, added the direct payments. This approach allowed us to estimate the profitability of running a farm both with and without direct payment.

We also calculated the share of direct payments in the farm profit, subtracting the expenses from the income, then adding the sum of direct payments and dividing that sum by the income minus the expenses. If a negative value was obtained, following from a net loss, the indicator was given as an absolute value and added a value of 1. Next, an average indicator was calculated to demonstrate the average surplus in the profit made by the farm.

Only 12 of the respondents were women. The respondents chose between three age bands; 26 of them were aged 18-40. These are considered as young farmers, eligible for funds owing to their young age. 35 people declared being between 41 and 65 years old, and only three respondents were over 65 years old. In terms of residence, the respondents were asked to indicate the municipality in Nidzica District where their farms were located. Most farmers, 28 respondents, came from the municipality of Janowiec Kościelny. 13 farmers lived in Nidzica municipality; the same number came from Kozłowo. The smallest group of respondents lived in the municipality of Janowo (10 out of 64 respondents). The respondents were also asked to identify the main profile of their farms. 27 declared crop productions; this option was open to those who did not raised farm animals. If the farmers kept animals, but the income from animal production was insignificant, or if they also cultivated and sold crops, they indicated the option of mixed production (14 farmers). 23 farmers chose livestock production,

which means that a farm produces crops for animal feeding; the animals are then sold or used otherwise, for example for milk production. Another question in the survey referred to the size of the farms. It turned out that the average area of a farm was 55.21 hectare (the largest farm area was 218.22 ha, the smallest one – 3 ha). The farms were divided into six groups depending on their size. The largest number of farms, 16, fell into the 20-40 ha band. 15 farms had between 0 and 20 hectares of farmland; the same number of farms had a size of 40-60 hectares. Another group was composed of 11 large farms (an area over 100 hectares). The smallest groups were farms with 60-80 hectares (4 farms) and 80-100 hectares (3 farms).

Research results

The survey contained 4 questions concerning the financial situation of the farms. The first one investigated the income of the farms in 2021. The average income reached PLN 305,079, and the median income was PLN 166,750. Because of the wide diversity in the size of the farms, the average income was made by both small farms with low income (the lowest was PLN 18,000) and large farms with high income (the largest income reported was PLN 2,150,000). When it comes to expenses of the farms, the average annual value was PLN 185,518, and the median was PLN 102,000. The lowest value of expenses among the studied farms was PLN 6,200, and the highest value was PLN 1,000,000. The average difference between the income and expenses was then PLN 119,561, and the median difference was PLN 64,750. However, when we calculated the share of expenses in the income of the farms, as an average and a median, we achieved an approximate value of 61%.

Fifty-seven out of all the studied farms declared making some investment into fixed assets in 2021. The average yearly value of the investment was PLN 147,848, and the median value was PLN 70,000. With regard to subsidies, the sum declared in the surveys referred to the basic direct payments enlarged by additional payments (i.e. direct payments and payments from other programmes, e.g. dedicated to ecology, dairy cows grazing, agricultural-environmental measures, etc.); it did not, however, take into account the participation in such programmes as funds for restructuring, young farmers, or modernization. What we arrived at was the average sum of direct payments received by one farm equal PLN 73,602, with the median at PLN 59,000.

Upon the analysis of the impact of direct payments on the investment, we can conclude that 53 farms of the total 64 farms under the study could afford to make investments in 2021 (Fig. 1). This was estimated based on the following calculation: we added the direct payments to the profit made by the farm and subtracted the amount of investment into fixed assets. These were the

farms which, despite making some investments, still recorded a profit for the year. When we compare the number of farms where investment was made (57) with the number of farms where investment could have been made at the self declared level in 2021 (53), we obtain the difference of 4 farms. This discrepancy follows from the fact that farmers making investments in 2021 used funds from previous years as well as loans. If the investment in fixed assets is deducted from the profit, but the direct payments are not accounted for, only 28 farms could afford to invest at the level attained in 2021. This is by as much as 47% less than when direct payments are counted in; if we assume the average budget at the disposal of the farmers after the investment declared for 2021, it can be inferred to be different when direct payments are accounted for and when they are not. If we account for the direct payments in the budget, we arrive at the average amount of PLN 45,315 per farm; if we do not account for the payments, the amount decreases to PLN 28,287, which makes a difference of PLN 73,602. Similar calculations apply to the median values; in the first case, the budget would be PLN 32,750, while if the direct payments were not involved, it would fall to PLN 15,000, which gives a difference of PLN 47,500. Moreover, the fact that the farms would make a loss if the investment was made at the same level without the direct payments indicates that these payments are indispensable. The research results indicate the scale of the impact of direct payments on the budget of farms in 2021. The higher the amount of payments received by the farm, the wider the difference between the direct investment ability with and without the payments.

If we ignore the level of investment made in 2021 and only calculate the profit of agricultural farms in two analogous cases, including and excluding the direct payments, we detect that 62 out of 64 farms earned a profit in 2021 when direct

Fig. 1. Budget of farms with investment, including direct payments
Source: the authors, based on the research results.

payments were included (Fig. 2). If we exclude direct payments in the budget calculations and focus only on the income and expenses incurred by the farms, we see that only 59 out of 64 farms earned a profit. The average profit of a farm was PLN 119,561 without the payments and PLN 193,162 with the payments, which renders a difference of PLN 73,601. This means that direct payments constitute around 38% of the profit made by farms. For three farms, the payments were a crucial factor determining the profitability of production, making it possible to achieve a positive financial result. In two farms, the production was not profitable even despite the direct subsidies, but the amounts needed to achieve the positive result were just PLN 3,000 and PLN 8,995.

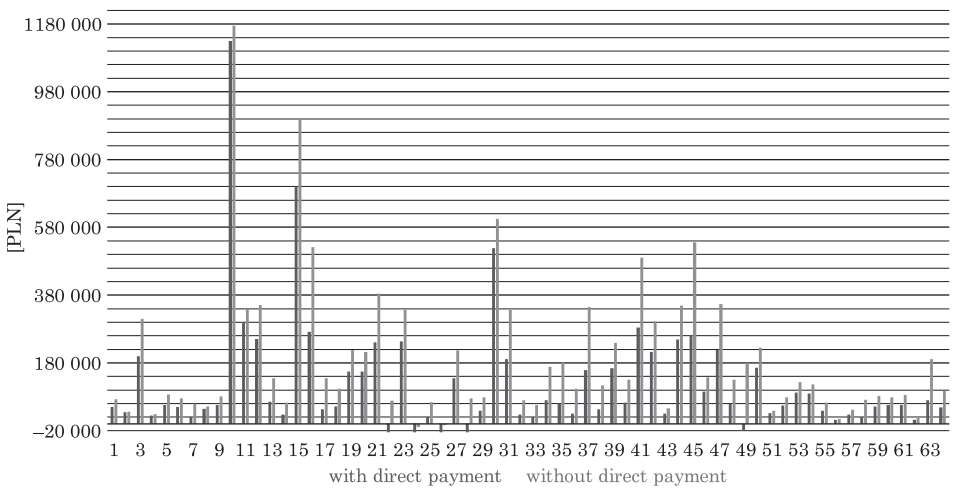

Fig. 2. Profit of the studied farms in 2021
Source: the authors, based on their research.

If we analyze the situation depending on the sex of farmers, it is evident that women farmers earned much lower incomes and also incurred lower expenses than the average. In both cases, the difference was approximately 50%. As for investments, this difference was even wider, as farms run by women invested less than the average by as much as PLN 82,018, or 56%. However, if we include the payments, farms owned by women invest only PLN 5,253 less than the general average. If there were no payments, women recorded a positive result with the other budget, at PLN 7,754. This means that 11 out of 12 farms managed by women can afford to invest with the use of funds from direct payments, and 8 of them even if direct payments were not available. Such differences may result from the fact that women are less eager to take a risk. Moreover, farms managed by women always earned a profit, of which the direct payment made up only 30%.

On farms run by men, both the income and expenses were higher than the average for all of the studied farms. Similarly, the sums of investment were higher (by over PLN 15,000) and so were the direct payments (by just over PLN 8,000). If we include the investment, the budget accounting for the direct payments was higher among farms run by men by PLN 200; where direct payments were excluded, the budget was lower by PLN 8,000. The number of farmers who could afford investment with the support of direct payments in the budget was practically the same as the general average, differing by just 1%. If the direct payments are excluded, the difference grows to 5%. Furthermore, three farms managed by male farmers recorded a loss in 2021, even when the direct payments were included. They constituted 39% of their income.

In the group of senior farmers, aged 65 years and more, the average income was PLN 288,667 and the expenses were PLN 162,400. These values are lower than in the general sample. Also, the sums of investments (PLN 133,333) and the direct payments (PLN 53,333) were lower than the overall average value. However, their budget when the investment is included is in better condition that the general average, both when the direct payments are included and when they are not. The profit made by these farms is higher than the general average without the direct payments, but lower when the payments are included. This is because the direct payments make up only 29% of the profit made by these farms.

On farms run by young farmers (aged below 40), direct payments made up 30% of the profit, and most of them did make a profit in 2021 (except for one farm, which made a loss in both cases). Their profit was higher than the average by PLN 23,391 with the payments, and by PLN 31,877 without the payments. These farms also recorded higher income by over PLN 34,000 and higher expenses by less than PLN 3,000. With regard to the investment, it was higher by PLN 11,490, even though the direct payments were lower than the general average by PLN 8,486. The percentage of farms managed by young farmers which could afford to make investments in 2021 using solely the funds from year 2021 exceeded the average by 10%. Also when the direct payments were excluded, young farmers were still able to make investments as planned, without incurring losses.

Farms managed by middle-aged farmers recorded lower income by around PLN 25,000, with the expenses lower by PLN 140. They also invested less by PLN 7,291 than the overall average; on the other hand, they received more direct payments, by PLN 8,041. However, their investment budget was lower than the general average for all the studied farms. Only 26 out of 35 farms, or 76%, invested at the level of the minimum profit supplemented with the direct payments for 2021. The other 24% had to finance the investment from other sources. In comparison to the general sample, fewer farmers (by 6%) in this group would make a positive financial result in this situation. In this age band,

direct payments constituted 46% of the farms' profit. Three farmers could not have coped without the payments; one farmer could not manage to make a profit even with the support of the payments.

Conclusion

To summarize the research results, we can conclude that both of the posed hypotheses have been confirmed. The research indicates that subsidies to operational activities on agricultural farms constitute a significant part of investment financing. This is supported by two observations made during the conducted research. The first is that the budget of the farms which we analyzed by taking into account the amount of investment made by farms in 2021, supplemented by direct payments, differs from the average budget by PLN 73,602, which is an average amount of direct payments received by the farm. If these payments are accounted for, the average budget amounted to PLN 43,315; without the payments, the budget is in the negative, at – PLN 28,287. It is evident that the farms could afford to make investment on a desired level owing to direct payments, by financing it from the profit made in 2021 and not incurring the loss. The other fact is the performance of 53 farms out of 57 (64 farms minus those which did not make any investment) which could afford to make investment relying only on the profit made in 2021. If such payments were not available, only 28, or less than half of the farms, could have afforded to make such investments. All of this means that the first hypothesis has been corroborated: agricultural farms could not have afforded to make investments on the same level if they had not obtained direct payments, which made a substantial contribution to such outlays.

The second hypothesis has also been supported. Upon calculating two variants of the farm's profit in 2021, we arrived at the conclusion that when direct payments are accounted for, the profit is higher by 38.2% than if they are not, which means that direct payments subsidizing the operational activity of farms constitute over 1/3 of their profit, which is in line with the assumed hypothesis.

To sum up, we can conclude that the economic aspect of the Common Agricultural Policy is tantamount to the sustainability of the farm, understood as the ability to a long term survival in the market despite unstable conditions, which has an evident impact on the level of income (Smędzik-Ambroży & Sapa, 2020, p. 196).

Translated by Jolanta Idźkowska

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