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THE IMPACT OF PUBLIC SUPPORT ON THE ECONOMIC PERFORMANCE OF FIELD CROP FARMS IN BULGARIA

KIRECHEV, DAMYAN [1]

Abstract
This study examines the impact of public support on the economic performance of field crop farms in Bulgaria. The study aims to assess the extent to which public support contributes to the income and growth of field crop farms across economic sizes. Economic models are used to assess the extent to which public support influences farm economic performance by improving farm efficiency and farmers' incomes. A comparison with similar farms in the EU is made, identifying and assessing key variables affecting farm economic performance, and providing suggestions for improving public support. The research methodology is based on panel data from FADN for the period 2007-2023, and regression analysis is used to assess the impact of factors such as subsidies, asset efficiency, indebtedness, and costs on income formation. The analytical work includes: 1) assessment of the relationship between net farm income and subsidies; 2) assessment of the dependence of net farm income on subsidies, resource management, and financial stability; 3) assessing the dependence of farmers' net income on the intensity of costs; and 4) assessing the dependence of farmers' net income on the structure of costs. The results provide empirical evidence on the effectiveness of public support, examining differences across European Union programming periods. The analysis of farmers' net income from subsidies indicates a strong positive relationship between the two variables, with a large share of farmers' net income attributable to subsidies. For the average field crop farm, the most significant factors for profitability are subsidies and ROA. A €1 increase in subsidies provides €1.67 in net farm income. The model explaining the impact of cost intensity on income identifies subsidies as a significant factor, along with the intensity of production costs. A €1 increase in subsidies provides €1.58 in net farm income. The model assessing the structure of costs on income indicates that ROA has the highest significance, while subsidies have a complementary effect. An increase in subsidies by €1 provides €1.53 in net farm income. The results prove the importance of subsidies and ROA as key factors for profitability in field crop farms. Subsidies at this stage of Bulgarian field crop farms remain crucial for covering production losses, but need to be linked to farm market performance and to achieving profitability and sustainability. The study can improve the information base for formulating policies to increase the economic sustainability of field crop farms in Bulgaria, depending on their size.

Keywords: public support, agriculture subsidies, field crop farms, efficiency, net income, FADN analysis.
JEL: Q12, Q18

Introduction

Field crop production plays a central role in Bulgarian agriculture and is crucial to the sector's development, the country's economy, and food security. Field crop production accounts for over two-thirds of gross value added in agriculture and is

[1] Chief Assis. Professor, PhD in economics, University of economics – Varna, Bulgaria, e-mail: dkirechev@ue-varna.bg

fundamental to the country's agricultural exports. Bulgaria is distinguished by its favourable natural and climatic conditions, as well as its long traditions in the cultivation of cereals and industrial crops. The level of specialisation is high, with a high level of production intensity. According to data from the FADN (on which the analysis is based), the number of farms in the sector increased from 16,600 (2007) to 25,300 (2023) in the period after the country accedes to the EU. The most significant increase is in the number of small farms, which rose from 12,7 thousand (2007) to 15,1 thousand (2023), followed by medium-sized farms, which rose from 2,0 thousand (2007) to 5,8 thousand (2023). (2023). The number of large farms is 1,5 thousand (2007) and is expected to increase to 3,1 thousand (2023), while the number of very large farms will increase from 0,3 thousand (2007) to 1,2 thousand (2023).

Public support is a crucial component of modern agriculture in European Union (EU) countries, particularly in countries like Bulgaria, where the sector continues to undergo restructuring and is strongly influenced by market factors. Through the EU's Common Agricultural Policy (CAP) and national instruments, public support for farms growing field crops provides income stability (through direct payments), encourages the adoption of sustainable practices (through eco-schemes, agroecology, organic production), encourages modernization and improves efficiency (through Rural Development Program interventions), supports the entry of young farmers, etc. In this respect, the role of public support can be seen in several aspects: 1) economic role – to compensate for market imperfections, to support income and competition; 2) social role – to overcome the depopulation of rural areas and support vulnerable groups; 3) environmental role – to promote sustainable practices that protect the climate, biodiversity, and soils; 4) regional role – to support the balanced development of territories and integration at the regional level.

Through the CAP instruments, public support has a significant impact on the economic situation, sustainability, and competitiveness of field farms in Bulgaria. Public support accounts for a significant share of farmers' income. Direct payments provide a significant cash flow and liquidity, enabling farmers to cover costs and losses. Investment support has a long-term impact, enhancing capital efficiency, labour productivity, resource utilization, and innovation potential. Public support limits financial risk (through direct payments and compensatory payments), encourages diversification, and improves the economic and environmental sustainability of farms. The effects of public support can also be seen in the preservation of production potential and the maintenance of the economic viability of field crop farms.

This leads to the main objective of the study – to assess the extent to which public support contributes to the generation of income and growth of agricultural holdings growing field crops, according to their economic size. Achieving this objective involves comparing similar farms across the EU, identifying and assessing key variables that influence farm economic performance, and proposing improvements

to support that may inform future policy for the sector. To achieve this objective, the study assumes that the use of economic models can help assess the extent to which public support influences farm economic performance by improving farm efficiency and farmers' incomes. Possible challenges of the study include identifying causal relationships that may limit some conclusions about the impact of public support on the maintenance of agricultural structures.

Review of the literature

The literature review examines a substantial number of studies from national and international publications that aim to identify the various effects of public support on the economic performance of agricultural holdings in Bulgaria. The diversity of studies suggests that they can be classified into several groups.

1) Analysis and assessment of effects on income and profitability for farms, including farms growing field crops. Some studies show that subsidies (in particular direct payments) are of great importance for maintaining positive income in Bulgarian farms (in particular those growing field crops). (Bachev, H., 2012; Todorova, S., Pochaleev, P., 2013; Turlakova, T., 2018; Beluhova-Uzunova, R., Atanasov, D., Shishkova, M., 2019; Ivanov, B. et al., 2021; Borisov, P., 2021; Georgieva, V.,2024). In-depth and careful assessments reveal that subsidies play a crucial role in supporting income and mitigating losses for farms that produce field crops. In the context of national studies, it has been found that income is often positive only thanks to subsidies. In a previous study by the author, the relationship between net income and subsidies in small field crop farms was assessed, and a significant correlation was found. (Kirechev, D., 2024)

2) Analysis and assessment of effects on production efficiency. There are also a significant number of studies on the impact of subsidies on technical and economic efficiency and productivity. It has been demonstrated that subsidies can stimulate or weaken economic and technical efficiency and encourage cost optimization in field crop farms worldwide.(Kumbhakar, S.C., Lien, G. (2010); Rizov, M., Pokrivac, J., Ciaian, P., (2013); Ciaian, P., Kancs, A., Swinnen, J. (2018); Biagini, L., Antonioli, F., Severini, S. (2022); Paula, et al., (2023); Liu, F. et al., (2023); Bernini, C., Galli, F. (2024); Mamun, A. (2024)). Mishra et al. (2024) note that subsidies boost profits in the short term, but in the long term, they can undermine income sustainability due to market distortions. Studies on Bulgaria indicate that specialized farms, such as field crop farms, exhibit the highest technical efficiency, with subsidies having a positive impact on both efficiency and reducing regional disparities (Galluzzo, N. (2018); Ivanov, B. (2021)).

3) Analysis and assessment of effects on investment and sustainability – to the extent that subsidies support asset renewal, sustainability, and climate change,

similar observations have been reported in a large number of studies. (Bachev. H., 2016; Ivanov, B. et al, 2019).
4) Analysis and assessment of effects on the agricultural structure – to what extent subsidies favour the concentration of land and capital in farms and create sustainable structures in rural areas.
5) Analysis and assessment of regional and sectoral specificities as a result of support – in various sectors and regions, support is key, as it increases profitability and investment capacity in rural areas (Doitchinova, J., Stoyanova, Z. (2024); Todorov, Iv.; Stanimirova, M. (2022)). Given that field crop production is fundamental to the structure of agricultural output, the regions where it is developed receive significant funding.
A review of the literature reveals that numerous studies have examined the impact of public support on the economic performance of agricultural holdings, particularly field crop farms. However, it is also clear that there are gaps in the research on the impact of subsidies on farm performance, particularly regarding economic size, which this study partially aims to fill.

Methodology

The analysis of the impact of public support on the economic performance of agricultural holdings was conducted using data from the Farm Accountancy Data Network (FADN). Data for holdings for the period 2007–2023 were used. For the analysis, some of the data were structured by programming periods – First Programming Period (FPP) (2007-2013) and Second Programming Period (SPP) (2014–2022).
The economic results of agricultural farms (measured in euros, €) include: Economic size (SE005); Net value added (SE415); Gross output (SE131); Farmers' net income (SE420) (FNI); Profit, defined as the difference between gross output (SE131) and total resources (SE270). The attempt to assess which indicator characterizing economic performance should be used to examine the impact of public support is based on several arguments. It is generally accepted that economic size largely reflects the scale of the farm, but does not take into account efficiency. Net value added would be an excellent indicator, as it captures efficiency, but the production structure strongly influences it. Gross output mainly characterizes the volume of activity, but it also measures the scale of production rather than efficiency. Farmers' net income and profit are the most appropriate alternatives, especially profit, which excludes subsidies. However, given the significant variations in this indicator over the years and the limitations of the study, net farm income (SE420) is considered the primary indicator for assessing the economic performance of farms. Farm net income is defined as: Total output (SE131) – Total input (SE270) + Balance subsidies & taxes on investments (SE405) + Balance

current subsidies & taxes (SE600). Descriptive statistics of indicators characterizing the main economic results in farms are presented in Appendix, Table 1A.

Given the diverse forms of public support, Total subsidies – excluding on investments (SE605) was selected as the leading indicator for the analysis, including Total subsidies on crops (SE610) + Total subsidies on livestock (SE615) + Total support for rural development (SE624) + Subsidies on intermediate consumption (SE625) + Subsidies on external factors (SE626) + Decoupled payments (SE630) + Other subsidies (SE699). The approach adopted is that Total subsidies, excluding those on investments (SE605), better reflect public support than Balance current subsidies & taxes (SE600). The latter are calculated as Total subsidies – excluding on investments (SE605) + VAT balance excluding on investments (SE395) – Taxes (SE390).

For the purposes of this study, farms growing field crops in Bulgaria have been grouped into four economic categories based on their economic size. This grouping to some extent covers the classification of farms by size according to the observation of agricultural farms in Bulgaria by the Ministry of Agriculture and Food: 1) the "Small" category includes farms with an economic size of €2,000 to €25,000; 2) the "Medium" category includes farms with an economic size of €25,000 to €100,000; 3) the "Large" category includes farms with an economic size of €100,000 to €500,000; 4) "Very large" farms are those with an economic size of over €500,000.

A comparison was made between the average Bulgarian farm growing field crops and the average farm in the European Union (EU) to assess the extent to which public support for farms in Bulgaria affects their net farm income compared to the average farm in the EU.

The analysis of the impact of public support on the economic performance of farms specializing in field crops covers the following stages of analytical work:

1) Study of the relationship between Farm net income (SE420) and Total subsidies – excluding on investments (SE605), followed by an assessment of the potential of farms to generate profit. Insofar as subsidies form Farm net income, this leads to partial "endogeneity" (the dependent variable contains the independent variable), but allows for a certain degree of differentiation between Farm net income from the market and income from subsidies. This provides a basis for assessing what proportion of farmers' net income is "artificially maintained". Therefore, for the purposes of the assessment, the Subsidy Income Dependency Index ($Dependency_i$) (Model 1) is analysed, calculated as:

$$Dependency_i = \frac{Total\ subsidies\ (excl.\ inv.)\ (SE605)}{Farm\ net\ income\ (SE420)}, \quad (1)$$

According to this, if $Dependency_i>1$, the farm would be at a loss without subsidies; if $0<Dependency_i<1$, subsidies are more of a "supplement" to income, albeit not decisive; and if $Dependency_i$ tends toward 0, farms are independent of subsidies. To address the direct endogeneity between farmers' net income and subsidies, additional variables identified through regression analysis are included in the analysis. The aim is to assess whether subsidies improve efficiency rather than simply generating income.

2) To deepen the assessment of the dependence of income on public support, in the second stage of the analysis, the assessment focuses on the efficiency and financial sustainability of farms, together with subsidies to generate income. In this sense, the analysis continues with the construction of a balanced regression model that accounts for the direct effects of subsidies (public support), asset profitability (efficiency of capital use), and indebtedness (risk and financial sustainability). This allows for the simultaneous assessment of public support (policy), internal efficiency (resource management), and financial stability (risk). Model 2 has been constructed:

$$FNI = f\ (Subsidies + ROA + \text{Debt-to Equity Ratio})\text{ , where} \quad (2)$$

$$ROA = \frac{Farm\ net\ income\ (SE420)}{Total\ assets\ (SE436)}$$

$$\text{Debt-to Equity Ratio} = \frac{Total\ liabilities\ (SE485)}{Net\ Worth\ (SE501)}$$

3) Additional evaluation of the dependence of farmers' net income on public support, with an attempt to deepen the analysis by including an assessment of the impact of costs on income. Previous studies by the author on farms growing field crops (Kirechev, 2025) found a significant effect of production factor costs (rent, wages, interest), with rent costs having the most substantial impact on income. In this sense, the analysis of the effects of public support on income is deepened by including the intensity of costs to generate output, including Total specific costs (SE281) and Total farming overheads (SE336), which together form Internal consumption (SE275). Depreciation costs are not taken into account, as they are relatively constant in the resource structure. On this basis, Model 3 was constructed, taking into account the impact of subsidies, efficiency, and indebtedness, and production intensity on farmers' net income:

$$FNI = f\ (Subsidies + ROA +$$

Debt-to Equity Ratio+Intensity with production costs+Intensity with factor costs), (3)

where:

$$\textit{Intensity with production costs} = \frac{Total\ specific\ cost\ (SE284) + Total\ farming\ overhead\ (SE336)}{Total\ output\ (SE131)}$$

$$Intensity\ with\ factor\ costs = \frac{Total\ external\ factor\ costs\ (SE365)}{Total\ output\ (SE131)}$$

In an attempt to deepen the analysis of the impact of costs on net income and how subsidies support costs, regression analysis was used to assess the impact of the cost structure – for intermediate consumption and production factors – on income, based on the following Model 4:

$$FNI = f\ (Subsidies + ROA + Debt\text{-}to\ Equity\ Ration + Production\ cost\ structure + Factor\ cost\ structure)\ , \quad (4)$$

where

$$Production\ cost\ structure = \frac{Internal\ consumption\ (SE\ 275) = Total\ specific\ cost\ (SE284) + Total\ farming\ overhead\ (SE336)}{Total\ input\ (SE270)}$$

$$Factor\ cost\ structure = \frac{Total\ external\ factor\ costs\ (SE365)}{Total\ input\ (SE270)}.$$

While in Model 3 the intensity of expenditure reflects how "heavy" the costs of production are, in Model 4, the inclusion of the cost structure allows us to assess where the resources invested go and how the costs "come out" of the effect of public support. This will enable an assessment of weaknesses that mitigate the effectiveness of subsidies.

Results and discussion

The field crop cultivation sector is fundamental and dynamically developing in Bulgarian agriculture, with significant public support. In 2023, compared to 2007, the economic size of farms will increase 2.3 times – from €48,0 thousand per farm (2007) to €109,0 thousand/ farm (2023). In terms of economic size, the average Bulgarian farm significantly exceeds the average farm of the same type in the EU. Total output is expected to increase 2.6 times – from € 53.8 thousand/farm (2007) to €139.9 thousand/farm (2023), which also exceeds the average farm in the EU. The net added value of farming increased 2.2 times (1.1 times in the average EU farm), while net farm income grew by an average of 5.0% per year – from €15.3 thousand/farm (2007) to €67.3 thousand/farm (2022), but was significantly lower in 2023 – only €2.9 thousand/farm. Over the same period, on the average EU farm, net farm income changed less dramatically (0.9% per year), increasing from €23,5 thousand/farm (2007) to €37,6 thousand/farm (2022). The average net income per farm in the EU is expected to be €20.2 thousand in 2023. The excess of Total Output in value over Total inputs invested in the average Bulgarian farm is highly volatile, with Total Output failing to cover total resources in a significant number of years, resulting in economic losses for farms. For the same period of analysis, on average, in the EU farm, Total output only covered total costs in one year (2009). The coverage of resources invested in production on the average farm growing field

crops in Bulgaria and in the EU, measured as an index and as a difference, is presented in Figure 1. This increases the dependence of Bulgarian field crop farms on public support to generate a positive net farm income. In terms of farm size, small farms demonstrate greater resilience in covering their resource costs with output. As farm sizes grow, this problem becomes more acute. This can be attributed to lower costs (especially for rent and wages), the search for options to produce higher-value crops, and other factors. The coverage of resources by farm size and production is presented in Appendix Figure 1A.

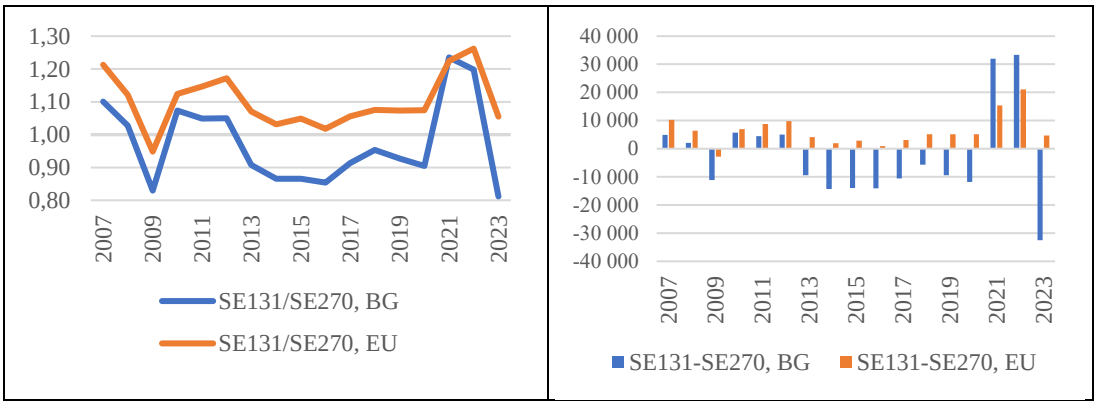

Figure 1. Coverage of inputs by outputs – index (left), spread in €/farm (right)

Source: FADN

Public support for field crop farms has increased significantly between 2007 and 2023. On the average Bulgarian farm, Total subsidies – excluding on investments (SE605) increase 3.3 times, from €10.5 thousand/farm (2007) to €34.7 thousand/farm (2023), with an average annual growth rate of 7.8%. In comparison, on the average EU farm, Total subsidies – excluding on investments (SE605) increase only 1.2 times, from €13.7 thousand/farm (2007) to €16.2 thousand/farm (2023), with an average annual growth rate of 1.1%. The larger size of Bulgarian farms is also reflected in the larger number of subsidies. In small farms, total subsidies increase 5.7 times – from 1.1 thousand €/farm (2007) to 6.6 thousand €/farm (2023), by 11.5% on average per year. In medium-sized farms, total subsidies increase 1.8 times – from 11.5 thousand €/farm (2007) to 21.0 thousand €/farm (2023), by 3.8% on average per year. In large farms, total subsidies increase 1.4 times, from 57.7 thousand €/farm (2007) to 82.0 thousand €/farm (2023), by 2.2% on average per year. In very large farms, total subsidies increase 2.0 times – from €156.4 thousand/farm (2007) to €312.5 thousand/farm (2023), with an average annual growth rate of 4.4%. The higher growth rate of support for small-sized farms can be attributed to policies aimed at farm-size supplements.

In structural terms, direct payments predominate in the support for field crop farms, with their absolute amount increasing from €8,5 thousand/farm (2007) to €25,3 thousand/farm (2023), but decreasing from 84% (2007) to 73% (2023) of total subsidies. For the average farm in the EU, direct payments are relatively constant at €11,5-12,0 thousand/farm, but decrease in the structure of total subsidies from 89% (2007) to 79% (2023). Between 2007 and 2023, the share of support for rural development increased significantly. On small farms, the share of direct payments in total support is the smallest, but it increases with increasing farm size. The structure of the main payment types by farm type in 2023, compared with 2007, is presented in Table 1.

Table 1. Structure of public support by type of farm and type of payment

Indicator	Year	(SE606) Total direct payments (€/farm)	(SE610) Total subsidies on crops (€/farm)	(SE624) Total support for rural development (€/farm)	(SE630) Decoupled payments (€/farm)	(SE699) Other subsidies (€/farm)
BG	2007	84,1%	1,7%	0,0%	59,7%	24,0%
	2023	72,7%	4,4%	5,4%	68,0%	14,5%
EU	2007	88,6%	13,3%	11,2%	70,1%	5,7%
	2023	78,8%	6,4%	16,1%	71,0%	5,4%
Small	2007	89,6%	15,3%	0,0%	54,8%	21,8%
	2023	53,5%	6,4%	11,0%	47,0%	23,8%
Medium	2007	88,7%	2,3%	0,0%	63,4%	23,0%
	2023	62,0%	7,8%	10,5%	54,1%	18,5%
Large	2007	83,2%	0,1%	0,0%	60,4%	24,8%
	2023	73,7%	3,7%	4,1%	69,8%	15,6%
Very large	2007	81,5%	0,0%	0,0%	58,1%	23,5%
	2023	80,8%	3,2%	3,0%	77,0%	9,9%

Source: FADN and own calculation

A more in-depth analysis of the relationship between subsidies and farmers' net income was conducted by measuring the subsidy dependency index using Model 1, with the results presented in Table 2. The data show that the average Bulgarian farm growing field crops is significantly more dependent on subsidies for its net income than the average EU farm. Only small farms maintain their net income to a greater extent with lower dependence on subsidies. It is striking that during 2021–2022, when farms were operating under crisis conditions and agricultural commodity

prices reached high levels, they still managed to achieve significant net farm income. However, this achievement was quickly disrupted by the collapse of agricultural commodity prices in 2023. This had a powerful impact on large and very large farms (even very large farms achieved negative net farm income).

Table 2.Index of dependence of farmers' net income on subsidies by type of farm, 2007–2023

Year/farm type	BG	EU	Small	Medium	Large	Very large
2007	0,68	0,58	0,41	0,51	0,90	0,63
2008	0,90	0,72	**13,01**	0,89	0,82	0,80
2009	**2,11**	**1,27**	0,81	**1,33**	**4,54**	**2,26**
2010	0,80	0,72	0,74	0,92	0,91	0,65
2011	0,83	0,66	1,38	0,95	0,92	0,62
2012	0,83	0,61	0,49	0,98	**1,03**	0,78
2013	**1,54**	0,82	0,97	**1,60**	**2,28**	**1,49**
2014	**1,99**	0,93	**1,01**	**1,81**	**2,89**	**1,91**
2015	**1,79**	0,86	0,59	**1,34**	**2,80**	**2,39**
2016	**2,23**	0,99	0,70	**1,39**	**3,49**	**3,63**
2017	**1,44**	0,86	0,69	**1,18**	**2,11**	**1,59**
2018	**1,20**	0,79	0,60	**1,01**	**1,60**	**1,33**
2019	**1,39**	0,79	0,66	**1,11**	**1,93**	**1,56**
2020	**1,49**	0,80	0,72	**1,13**	**1,79**	**1,91**
2021	0,49	0,52	0,54	0,62	0,55	0,44
2022	0,50	0,45	0,51	0,66	0,59	0,43
2023	**11,75**	0,80	0,86	**1,78**	**22,56**	**–3,27**
2007–2013	**1,10**	0,77	**2,55**	**1,03**	**1,63**	**1,03**
2014–2022	**1,39**	0,78	0,67	**1,14**	**1,97**	**1,69**

Source: FADN and own calculation

The study examined the relationship between farmers' net income and subsidies from 2007 to 2023 by analysing the correlation between the two variables. In particular, how net income depends on subsidies. The assessment of the correlation coefficient (Pearson) between the two variables shows conflicting results – 0,21 for the average farm in Bulgaria (weak), 0,37 for the average farm in the EU (medium), 0,84 for small farms (strong), 0,73 for medium-sized farms (strong), 0.15 for large farms (weak), and 0.06 for very large farms (weak). As the farm's size increases, the correlation between income and subsidies as indicators decreases. However, the

low reported dependence should not be attributed to the absence of a statistical relationship between the variables. This can be explained mainly by the fact that subsidies are included as a factor in farmers' net income, and thus a component forming the income is linked to its own component. The presence of partial endogeneity does not imply that subsidies do not support income, because their relative impact varies widely across farm types and years. In some years, costs and production dominate, and subsidies account for a relatively small share, which explains the weaker statistical relationship. However, for other years, it can be argued that without them, farms would have incurred losses, which also contributes to the low correlation. Therefore, studying the relationship between income and subsidies is an initial step in assessing the impact of public support on farmers' net income.

To the extent that the number of subsidies is not proportional to market performance, a weak relationship with income can be assumed. In this sense, calculating the dependency index and seeking additional assessments of the dependency of income on subsidies can provide more detailed information to distinguish between market income and subsidy income (since the Pearson coefficient reflects the structure of support rather than its effect). The analysis of the determinants of farmers' net income from subsidies reveals a strong correlation between the two variables, suggesting that subsidies account for a significant portion of farmers' net income. The determination of farmers' net income from subsidies for field crop farms in Bulgaria and the EU is presented in Figure 2. As the economic size of farms increases, the determination of income from subsidies (measured by R^2) decreases – for small farms, it is R^2=0,9386, for medium-sized farms, R^2=0,8987, for large farms, R^2=0,6965, and for very large farms, R^2=0.6199.

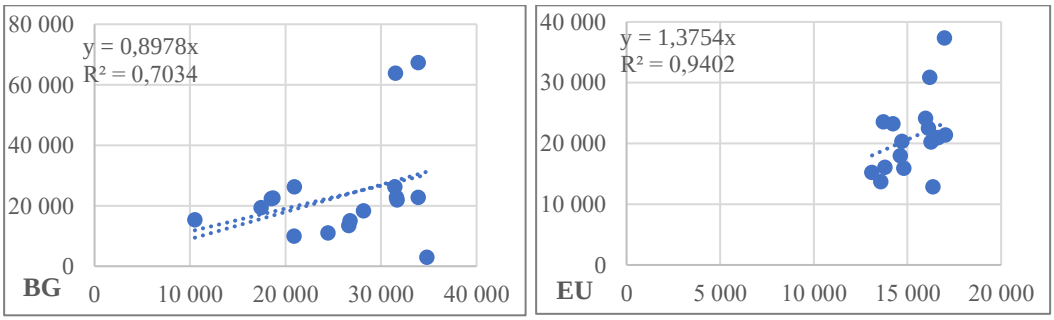

Figure 2. Determination of the relationship between net farm income and subsidies for average farms in Bulgaria (left) and the EU (right), 2007–2023

Source: FADN and own calculation

Overcoming the partial endogeneity in assessing the impact of subsidies on income formation required the development of models incorporating additional control variables to ensure greater reliability and isolate the pure effect of subsidies. The inclusion of control variables such as land, labour, and capital would allow for an evaluation of how resource use generates net income. Such a model was tested to assess how farmers' net income is affected by subsidies, Total Utilised Agricultural Area (SE025), Total Labour Input (SE010), and Total Assets (SE436). The test results showed that land and labour do not lead to higher income, given that the agricultural land used is relatively constant (averaging around 133 ha/farm) and the labour input decreases from 3.94 AWU/farm (2007) to 2.89 AWU/farm (2023). The changes in labour input can be attributed to the increasing mechanization of crop production. However, capital represented by assets was shown to have a positive effect on income, and subsidies in this model did not exhibit a positive correlation, as they likely offset losses. This largely determined the construction of Model 2, which examined the impact of subsidies, assets, and indebtedness on farmers' net income. Since assets and indebtedness in farmers' net income are on different scales and are a prerequisite for collinearity, the assessment included ratios such as ROA (return on assets; SE420/SE436) and the debt ratio (SE485/SE501). This eliminates the influence of scale and focuses the assessment on efficiency and financial sustainability, which better reflect whether subsidies improve efficiency. After controlling for the scale of activity, the data used in the analysis of the following models are equated based on Total Utilised Agricultural Area (ha/farm) (SE025).

The assessment of the data for ROA and Debt-to Equity Ratio shows that during the period of analysis in the average Bulgarian farm growing field crops, the amount of assets increases 4.0 times, from 79.9 thousand €/farm (2007) to 322.2 thousand €/farm (2023), by 9.1% on average per year. Total debt grows at a faster rate of 5.2 times – from 15.3 thousand €/farm (2007) to 80.5 thousand €/farm (2023) – at an average annual rate of 10.9%. Equity changes 3.7 times – from 64.5 thousand €/farm (2007) to 241.7 thousand €/farm (2023), by 8.6% on average per year. The structure of the balance sheet values for farms indicates a good level of financial stability, as demonstrated in previous studies (Koteva, N., 2016; Kirechev, D., 2022). The average return on assets for Bulgarian farms over the entire period is 12.4%, and the average debt ratio is 34.2%, compared to EU averages of 5.8% and 15.7%, respectively. The dynamics of the ratio show that ROA decreased during the second programming period compared to the first (except for small farms), and the Debt-to-Equity Ratio decreased for all farms (except for very large farms).

The results of Regression Model 2 (Appendix, Table 2A), which takes into account the impact of subsidies, asset efficiency, and indebtedness on the formation of farmers' net income, show that the independent variables in the model can explain farmers' net income, given the high level of the coefficient of determination R2.

For the average Bulgarian farm, subsidies and ROA are more significant factors (see Table 3). An increase in subsidies by €1 on average would result in a € 1,67 increase in farmers' net income, indicating that subsidies are a significant factor in economic performance. ROA also proves to be a significant factor, as a 1% increase in ROA would result in a 20,58% increase in farmers' net income, given the ability of assets to generate returns. Regarding the Debt-to-Equity Ratio, it lacks statistical significance, indicating that indebtedness is not a reliable indicator of farmers' net income formation in this model. Given that the Intercept is negative, it is more a technical than a practical interpretation, reflecting the influence of other factors on farmers' net income. On average, EU farms are influenced by significant factors, including ROA and subsidies, with ROA having the most substantial impact. In small farms, ROA is a significant factor, while subsidies and the debt-to-equity ratio are insignificant. In medium-sized farms, subsidies and ROA are significant factors. On large farms, ROA has the greatest effect, but at $\alpha = 10\%$, all factors are significant. In very large farms, the model is weaker but still acceptable, with subsidies and ROA having a strong effect.

Table 3. Significance of factors for farmers' net income based on Model 2

Farm type	Adj. R^2	Significant factors	Strongest effect	Insignificant factors
BG	0,816	Subsidies (+), ROA (+)	ROA	Debt-to-Equity Ratio
EU	0,978	ROA (+++), Subsidies (+)	ROA	Debt-to-Equity Ratio
Small	0,934	ROA (+)	ROA	Subsidies, Debt-to-Equity Ratio
Medium	0,838	Subsidies (+), ROA (+)	Subsidies & ROA	Debt-to-Equity
Large	0,824	ROA (+)	ROA	Subsidies (near), Debt-to-Equity Ratio (near)
Very Large	0,658	Subsidies (+), ROA (+)	ROA & Subsidies	Debt-to-Equity Ratio

The inclusion of costs in Model 3 and Model 4 provides added value to the assessment of farmers' net income, as they are a key element in the financial sustainability of farms. If costs grow faster than gross output, then subsidies are a significant factor in determining farm income. In Model 3, two additional variables are included in the factors already examined: 1) intensity of production costs (specific costs + maintenance costs = intermediate consumption) to produce a unit of output; 2) intensity of production factor costs to create a unit of output. The inclusion of these indicators demonstrates the impact of “production pressure” on

income and the extent to which subsidies contribute to income. For the purposes of Model 3, farm costs are normalized per unit of agricultural area used.
In the average Bulgarian farm, Total specific cost (SE281) increased 3.5 times – from €16.3 thousand/farm (2007) to €57.7 thousand/farm (2023), at an average annual increase of 7.2%. Total farming overhead (SE336) increased 2.4 times – from €12.9 thousand/farm (2007) to €31.7 thousand/farm (2023), by 5.8% on average per year. Total external factor cost (SE365) increased rapidly by 4.2 times – from €14.7 thousand/farm (2007) to €62.6 thousand/farm (2023), by 9.4% on average per year, with rent costs growing the fastest – by 5.7 times and 11.5% on average per year. Rent costs accounted for 49% of total factor costs (2007), and their share reached 66% in 2023. In the average EU economy, these costs change at a relatively slower pace – specific costs increase by 2.1 times (4.6% on average per year), maintenance costs increase by 1.7 times (93.4% on average per year), and factor costs increase by 1.6% (3.1% on average per year), with rent costs being only 38–46% of total factor costs.
The results of regression Model 3 for all types of farms (Appendix, Table 3A) show that the model explains to a significant extent the variation in farmers' net income from the variables listed (Adjusted R-square > 0.8, with the lowest value for large farms and the highest for farms in the EU and small farms in Bulgaria. On average, Bulgarian farms are most affected by subsidies, with other significant factors including the intensity of production costs (see Table 4). Insignificant factors include ROA and the Debt-to-Equity Ratio. At $\alpha = 10\%$, the intensity of factor costs is also significant. A 1% increase in subsidies leads to a 1.58% increase in farmers' net income, which proves the importance of subsidies for the income of farms growing field crops. A 1% decrease in the intensity of production costs generates an 8.3% increase in farmers' net income. On average, the most significant factors in EU farms are ROA, Debt-to-Equity Ratio, and Intensity with factor cost, with ROA having the most significant effect. Subsidies and the intensity of production costs are relatively insignificant factors in determining income. This can be explained by the potential of the average EU farm to generate net farm income even without subsidies. Labor costs, which affect income, predominate in the factor cost structure, while production costs are covered by the output generated. On small farms in Bulgaria, subsidies, ROA, and production cost intensity are significant factors. Less significant are the debt-to-equity ratio and intensity with factor costs. In medium-sized farms, subsidies and the intensity of production costs are significant factors, with subsidies having a powerful effect. For large farms, none of the variables are significant for farmers' net income. On very large farms, Intensity, combined with factor costs and subsidies, has the most significant effect. As farm sizes increase, costs rise, especially rent costs.

Table 4. Significance of factors for farmers' net income based on Model 3

Farm type	Adj. R^2	Significant factors	Strongest effect	Insignificant factors
BG	0,87905	Subsidies (+), Intensity with production costs (-)	Subsidies	ROA, Debt-to-Equity Ratio, Intensity with factor costs (near)
EU	0,98641	ROA (+++), Debt-to-Equity Ratio (++), Intensity with factor costs (-)	ROA	Subsidies, Intensity with production costs
Small	0,96309	Subsidies (++), ROA (++), Intensity with production costs (-)	Subsidies & ROA	Debt-to-Equity Ratio, Intensity with factor costs
Medium	0,93372	Subsidies (+++), Intensity with production costs (-)	Subsidies	ROA, Debt-to-Equity Ratio, Intensity with factor costs
Large	0,81707	-	-	All variable
Very Large	0,83355	Intensity with factor costs (-), Subsidies (+)	Intensity with factor costs	ROA, Debt-to-Equity Ratio, Intensity with factor costs

In Model 4, the variables are modified so that the intensity of costs to generate output is replaced by the cost structure in Total inputs. The model's logic is to assess which costs most significantly reduce farmers' net income and determine the need for subsidies. In this model, in addition to ROA and the Debt-to-Equity Ratio, the Production cost structure ((SE281 + SE336)/SE270) and Factor cost structure (SE365/SE270) are also included. For the purposes of Model 4, costs are also normalized by the area of agricultural land used.

An analysis of the cost structure of the average Bulgarian farm shows a decrease in the share of production costs from 60.0% (2007) to 51.9% (2023), which can be explained by the restructuring of production towards less cost-intensive crops, as well as improvements in agricultural technology (reduction in fertiliser and plant protection norms, introduction of resource-saving technologies, etc.). The average share of production costs in total resources is 52.6%. At the same time, factor costs have increased significantly from 30.2% (2007) to 36.3% (2023). The average factor cost is 35.0%, reaching 40.7% in 2021. The increase is primarily due to the cost of renting land, and to a lesser extent, to the rise in paid labour. Interest costs are relatively constant, although indebtedness is growing, but lower interest rates offset this. Unlike farms in Bulgaria, the average EU farm has production costs of around 62-68% and factor costs of only 19-21%. On small farms in Bulgaria, production costs average 52.4% and decreased during the second programming

period, while factor costs average 26.8% and are decreasing. On medium-sized farms, production costs account for approximately 57.2% and factor costs for 34.6%. In large farms, the share of production costs is 56.2% and decreases significantly during the second programming period, while factor costs increase significantly (on average, 36.8%). The situation is similar in very large farms, where production costs are significant, averaging 53.4% of total costs, and the average factor costs are 36.6% (in recent years of analysis, they have even exceeded 40%).

Table 5. Significance of factors for farmers' net income based on Model 4

Farm type	Adj. R^2	Significant factors	Strongest effect	Insignificant factors
BG	0,86025	ROA (+++), Subsidies (++), Factor cost structure (-)	ROA	Debt-to-Equity Ratio, Production cost structure
EU	0,98522	ROA (+++)	ROA	Subsidies, Debt-to-Equity Ratio (near), Production cost structure, Factor cost structure
Small	0,93451	ROA (+++)	ROA	Subsidies, Debt-to-Equity Ratio, Production cost structure, Factor cost structure
Medium	0,82801	ROA (+++), Subsidies (+)	ROA	Debt-to-Equity Ratio, Production cost structure, Factor cost structure
Large	0,79216	ROA (+++)	ROA	Subsidies, Debt-to-Equity Ratio, Production cost structure, Factor cost structure
Very Large	0,76074	ROA (+++), Subsidies (+)	ROA	Debt-to-Equity Ratio, Production cost structure, Factor cost structure

The results of Regression Model 4 (Appendix, Table 4A), which analyses changes in income under the influence of subsidies, capital efficiency, and cost structure, are more uncertain. However, the model explains a significant extent of the variation in farmers' net income from these variables. As the average farm size increases, Adjusted R^2 decreases but remains high. In the average Bulgarian farm growing field crops, significant factors are ROA, Subsidies, and Factor cost structure, with ROA having the most substantial effect (see Table 5). The Debt-to-Equity Ratio and Production Cost Structure are insignificant factors. The model shows that a 1% increase in subsidies raises farmers' net income by 1.53%, while a 1% increase in ROA raises income by 19.12%. Changes in the cost structure are crucial for enhancing farmers' net income. In the average EU farm, ROA is the only significant

factor, but it is very important. In all farms, ROA is the strongest factor, while subsidies are also important for medium-sized and very large farms.
The analysis can be continued by programming periods. Based on Model 3, the regression estimates show that during the second programming period, subsidies have a stronger significance for maintaining farmers' net income ($\beta = 1.98$, $p < 0.05$). Intensity, along with factor cost, also has a positive impact. Based on the results of Model 4, it is striking that in the average Bulgarian farm, ROA is a significant factor in determining farmers' net income. For small farms, based on Model 3, subsidies are a significant factor in farmers' net income ($\beta = 1.58$, $p < 0.05$). In contrast, according to Model 4, none of the variables are significant (for all variables, $p > 0.05$). For medium-sized farms, Model 3 shows a higher significance of subsidies ($\beta = 0.858$, $p < 0.05$), ROA, and Intensity with factor cost. Model 4 shows the significance of subsidies ($\beta=0.68$, at $p<0.05$) and ROA. For large farms, the variables in Model 3 are insignificant, while in Model 4, subsidies, Debt-to-Equity Ratio, and Production cost structure are significant. In very large farms during the second programming period, all variables are significant in Model 3, and in Model 4, ROA is the determining factor. The analysis could be further deepened by considering other variables, but given the study's limitations, this remains an option for future research.

Conclusion

In conclusion to the analysis, the following summaries and recommendations can be made:

- ✓ The study of the relationship between farmers' net income and subsidies reveals that Bulgarian farms growing field crops are highly dependent on subsidies, as the products they produce barely cover the costs of resources. This is especially true as the size of farms continues to increase. The correlation between farmers' net income and subsidies is high, though it decreases as farm size increases. During the second programming period, compared to the first, subsidies play a greater role in income generation. This can be explained by the increase in the economic size of farms over time. Therefore, subsidies at this stage remain important for Bulgarian farms, as they enable farmers to cover their losses.
- ✓ The results of the analysis clearly showed that the efficiency of asset utilization (ROA) is a key factor in increasing income, implying the need for rational policy selection and the implementation of practices that enhance profitability. There is a need to improve the management level of farm managers.
- ✓ The level of indebtedness has no significant effect on income, but attention should be paid to the financing structure insofar as it diverts capital.

- ✓ The increase in the average size of farms reduces production costs but increases the costs of production factors. Expenditure policies are certainly important insofar as expenditure directly reduces income. Expenditure policies should be developed to promote resource-saving technologies and an optimal level of expenditure, particularly for production factor costs.
- ✓ Subsidy policy should support structural differences and the sustainability of farms. For small farms, it is essential to improve access to technology, while for large farms, it is crucial to encourage innovation and sustainability.
- ✓ Subsidies should be better targeted at improving efficiency rather than ensuring the economic survival of farms. This can be achieved to a large extent by linking subsidies to farm market performance, thereby promoting both profitability and sustainability. The development of subsidies should be directed towards increasing support for processing and creating high-value products, covering increased costs for improving sustainability, mitigating losses during crises, and other activities that enhance efficiency and mitigate production risks.

Adequate public support should not primarily maintain farm viability, but rather increase the efficiency of agricultural production.

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Annexes

Table 1A. Descriptive statistics of indicators characterizing the main economic results in farms growing field crops, 2007–2023

Indicator	Farm	Average	Median	Stand. dev.	Min	Max	Growth rate
(SE005) Economic size (€'000/farm)	BG, all farm	86	87	26	47	117	5,3%
	EU, all farm	57	58	8	41	68	2,9%
	Small	9	8	2	7	12	3,8%
	Medium	53	53	2	50	57	–0,1%
	Large	268	271	11	242	283	0,7%
	Very large	1 042	1 095	173	748	1 224	2,3%
(SE131) Total output (€/farm)	BG, all farm	105 678	95 515	36 424	53 779	201 514	6,2%
	EU, all farm	68 868	63 372	12 586	52 510	101 671	2,7%
	Small	11 707	11 106	2 645	8 222	18 016	2,9%
	Medium	58 880	57 272	14 370	42 383	92 808	0,5%
	Large	319 703	305 711	74 588	231 474	472 628	1,8%
	Very large	1 357 420	1 307 671	324 649	793 704	2 183 742	3,2%
(SE415) Farm Net Value Added (€/farm)	BG, all farm	61 907	52 279	26 492	29 268	131 499	5,0%
	EU, all farm	33 159	33 785	6 923	23 708	52 026	0,5%
	Small	8 670	8 050	2 925	4 497	15 785	5,9%
	Medium	38 628	35 837	7 707	27 751	55 528	–0,1%
	Large	179 048	157 289	49 170	119 830	287 529	0,8%
	Very large	761 100	701 630	244 968	425 748	1 407 471	1,1%

Indicator	Farm	Average	Median	Stand. dev.	Min	Max	Growth rate
(SE420) Farm Net Income (€/farm)	BG, all farm	23 575	21 918	16 479	2 960	67 317	–9,8%
	EU, all farm	20 995	20 830	5 946	12 843	37 315	–0,9%
	Small	5 582	5 505	2 971	148	12 324	6,5%
	Medium	19 043	18 272	6 128	9 706	33 152	–4,0%
	Large	59 319	41 202	40 189	3 637	131 311	–16,4%
	Very large	274 164	224 483	195 145	–95 716	689 855	7,0%
(SE131) Total input – (SE270) Total output (€/farm)	BG, all farm	–2 677	-9 373	16 017	–32 475	33 334	13,6%
	EU, all farm	6 406	5 121	5 430	-2 867	21 107	–4,7%
	Small	1 253	1 050	1 612	–1 741	5 297	–8,8%
	Medium	–1 274	-2 845	6 905	–10 318	11 209	–0,3%
	Large	167 430	23 575	348 441	–2 677	1 357 420	–37,2%
	Very large	97 431	23 575	182 243	–2 677	761 100	–177,2%

Source: FADN and own calculation

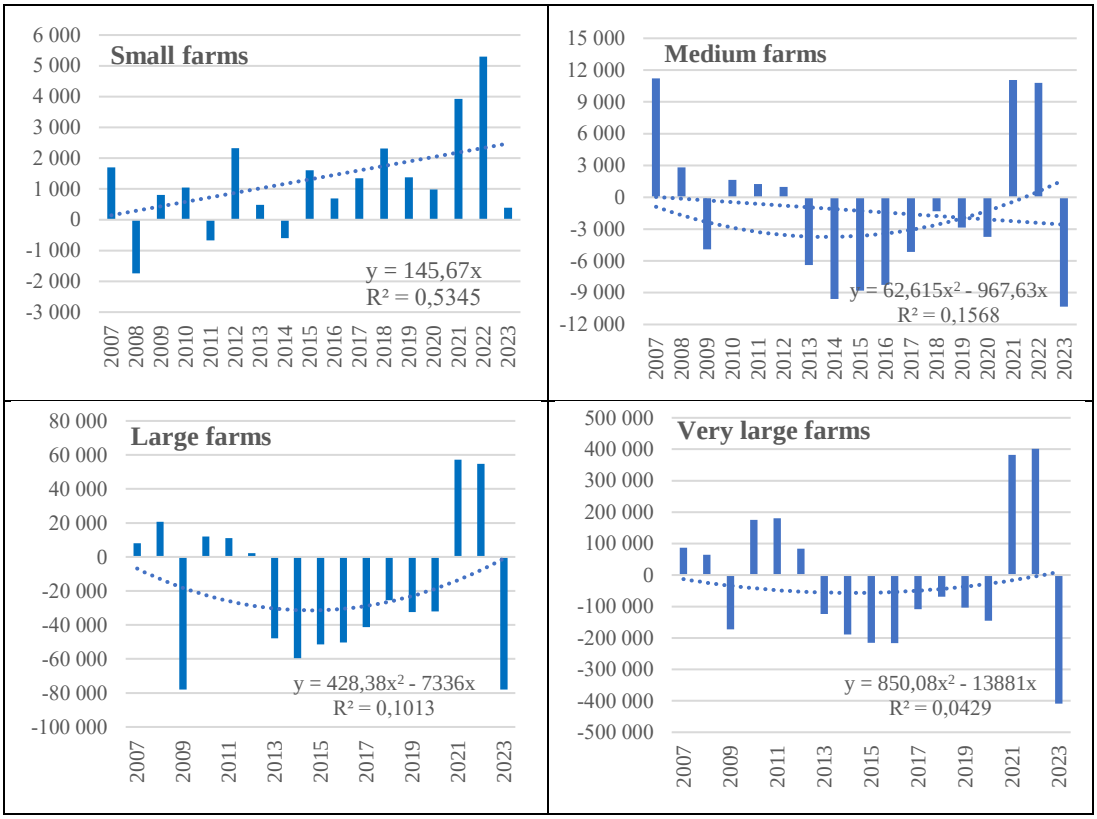

Figura 1A. Coverage of resources with production by size of holdings (SE131-SE270)

Source: FADN and own calculation

Table 2A. Results from regression statistics for the Model 2

Farm type	***Regression Statistics***		***Variable***	***Coefficients***	***P-value***
BG	Multiple R	0,92229	Intercept	–434,00	0,0011
	R Square	0,85063	**Subsidy**	**1,67**	0,0001
	Adjusted R Square	0,81615	**ROA**	**2057,95**	0,0000
	Significance F	**0,00001**	*Debt to Equity Ratio*	*83,40*	*0,5759*
EU	Multiple R	0,99116	Intercept	–423,85	0,0212
	R Square	0,98241	*Subsidy*	*0,73*	0,1873
	Adjusted R Square	0,97835	**ROA**	**6926,48**	0,0000
	Significance F	**0,00000**	**Debt to Equity Ratio**	**1348,51**	0,0005
Small	Multiple R	0,97293	Intercept	–44,96	0,3116
	R Square	0,94659	*Subsidy*	*0,27*	0,2161
	Adjusted R Square	0,93426	**ROA**	**1979,88**	0,0000
	Significance F	0,00000	*Debt to Equity Ratio*	*4,67*	0,6447
Medium	Multiple R	0,93180	Intercept	–219,78	0,0095
	R Square	0,86826	**Subsidy**	**1,07**	0,0000
	Adjusted R Square	0,83786	**ROA**	**1200,87**	0,0002
	Significance F	**0,00001**	*Debt to Equity Ratio*	*–11,33*	0,9134
Large	Multiple R	0,92565	Intercept	2,02	0,9918
	R Square	0,85683	*Subsidy*	*0,84*	0,1085
	Adjusted R Square	0,82379	**ROA**	**1221,04**	0,0000
	Significance F	**0,00001**	*Debt to Equity Ratio*	*–487,14*	0,0971
Very large	Multiple R	0,84965	Intercept	–567,54	0,0217
	R Square	0,72191	**Subsidy**	**2,76**	0,0028
	Adjusted R Square	0,65773	**ROA**	**2043,56**	0,0001
	Significance F	**0,00065**	*Debt to Equity Ratio*	*–49,70*	0,9226

Table 3A.Results from regression statistics for the Model 3

Type/indicator	***Regression Statistics***		**Type/indicator**	***Regression Statistics***	
BG	Multiple R	0,95752	**Medium**	Multiple R	0,97695
	R Square	0,91685		R Square	0,95443
	Adjusted R Square	0,87905		Adjusted R Square	0,93372
	Significance F	**0,00001**		Significance F	**0,00000**
Variable	***Coefficients***	***P-value***	***Variable***	***Coefficients***	***P-value***
Intercept	791,85	0,0949	Intercept	702,32	0,0063
Subsidy	**1,58**	0,0025	Subsidy	**1,27**	0,0000
ROA	*243,03*	0,7245	ROA	*76,77*	0,7936
Debt-to-Equity Ratio	*–69,60*	0,5995	Debt-to-Equity Ratio	*54,69*	0,5072
Intensity with production costs	–**830,01**	0,0180	Intensity with production costs	–**730,62**	0,0230
Intensity with factor costs	*–1312,28*	0,0838	Intensity with factor costs	*–1119,20*	0,0560
EU	Multiple R	0,99532	**Large**	Multiple R	0,93500
	R Square	0,99065		R Square	0,87423
	Adjusted R Square	0,98641		Adjusted R Square	0,81707
	Significance F	**0,00000**		Significance F	**0,00012**
Variable	***Coefficients***	***P-value***	***Variable***	***Coefficients***	***P-value***
Intercept	–77,24	0,6788	Intercept	350,03	0,3466
Subsidy	*0,86*	0,1471	Subsidy	*1,14*	0,0805
ROA	**5510,54**	0,0000	ROA	*630,23*	0,2606
Debt-to-Equity Ratio	**1337,52**	0,0003	Debt-to-Equity Ratio	*–241,43*	0,5397
Intensity with production costs	*–99,04*	0,7179	Intensity with production costs	*–306,24*	0,4561
Intensity with factor costs	–**1355,49**	0,0098	Intensity with factor costs	*–633,97*	0,2723
Small	Multiple R	0,98723	**Very large**	Multiple R	0,94104
	R Square	0,97463		R Square	0,88556
	Adjusted R Square	0,96309		Adjusted R Square	0,83355
	Significance F	**0,00000**		Significance F	**0,00008**

Type/indicator	***Regression Statistics***		**Type/indicator**	***Regression Statistics***	
Variable	***Coefficients***	***P-value***	***Variable***	***Coefficients***	***P-value***
Intercept	518,55	0,0107	Intercept	724,93	0,1371
Subsidy	**0,64**	0,0084	Subsidy	**1,75**	0,0121
ROA	**1188,39**	0,0039	ROA	*374,26*	0,5778
Debt-to-Equity Ratio	*2,29*	0,8269	Debt-to-Equity Ratio	*–185,64*	0,6079
Intensity with production costs	–**799,77**	0,0118	Intensity with production costs	–**1044,16**	0,0022
Intensity with factor costs	*–352,10*	0,4145	Intensity with factor costs	*–823,09*	0,2405

Table 4A. Results from regression statistics for the Model 4

Type/indicator	***Regression Statistics***		**Type/indicator**	***Regression Statistics***	
BG	Multiple R	0,95075	**Medium**	Multiple R	0,93902
	R Square	0,90392		R Square	0,88176
	Adjusted R Square	0,86025		Adjusted R Square	0,82801
	Significance F	**0,00003**		Significance F	**8,9E-05**
Variable	***Coefficients***	***P-value***	***Variable***	***Coefficients***	***P-value***
Intercept	-2262,43	0,0456	Intercept	495,05	0,7189
Subsidy	**1,53**	0,0110	Subsidy	**0,79**	0,0211
ROA	**1912,40**	0,0000	ROA	**1221,27**	0,0012
Debt-to-Equity Ratio	*161,86*	0,2755	Debt-to-Equity Ratio	*–111,31*	0,4586
Production cost structure	*1848,90*	0,1324	Production cost structure	*–1036,19*	0,4909
Factor cost structure	**2498,86**	0,0379	Factor cost structure	*–142,71*	0,9356
EU	Multiple R	0,99491	**Large**	Multiple R	0,92580
	R Square	0,98984		R Square	0,85711
	Adjusted R Square	0,98522		Adjusted R Square	0,79216
	Significance F	**0,00000**		Significance F	**0,00001**
Variable	***Coefficients***	***P-value***	***Variable***	***Coefficients***	***P-value***
Intercept	–653,26	0,0955	Intercept	26,85	0,9777
Subsidy	*0,12*	0,8042	Subsidy	*0,79*	0,2292

Type/indicator	***Regression Statistics***		**Type/indicator**	***Regression Statistics***	
ROA	**6595,63**	0,0000	ROA	**1221,69**	0,0001
Debt-to-Equity Ratio	*801,60*	0,0572	Debt-to-Equity Ratio	*–470,24*	0,1702
Production cost structure	*855,87*	0,1014	Production cost structure	*–61,68*	0,9512
Factor cost structure	*–189,07*	0,7781	Factor cost structure	*27,36*	0,9821
Small	Multiple R	0,97723	**Very large**	Multiple R	0,91406
	R Square	0,95497		R Square	0,83551
	Adjusted R Square	0,93451		Adjusted R Square	0,76074
	Significance F	**0,00000**		Significance F	**0,00051**
Variable	***Coefficients***	***P-value***	***Variable***	***Coefficients***	***P-value***
Intercept	1140,96	0,2303	Intercept	–906,74	0,4926
Subsidy	*0,16*	0,4740	Subsidy	**1,93**	0,0208
ROA	**2177,59**	0,0000	ROA	**1939,84**	0,0001
Debt-to-Equity Ratio	*2,66*	0,8417	Debt-to-Equity Ratio	*–5,40*	0,9908
Production cost structure	*–1456,75*	0,1866	Production cost structure	*–27,84*	0,9852
Factor cost structure	*–1139,19*	0,3419	Factor cost structure	*1415,24*	0,2808