

ECONOMIC SIZE OF FARMS AND THE VALUE OF ACQUIRED DIRECT SUBSIDIES VERSUS PRODUCTION ORIENTATION

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Abstract. The paper contains an attempt to determine the economic size of 147 examined farms, at the same time taking into account the European Union subventions acquired in the scope of the so-called direct payments (financed by European Guarantee Fund). The scope of work covered farms located within Southern Poland. Obtained results allow to conclude that the production direction may be a determinant of acquired direct surplus value. Received direct subsidies reaching 7.63-17.67 thousand PLN·farm⁻¹ allow to compensate for the values of incurred direct outlays.

Key words: agricultural type of farm, direct surplus, direct subsidies, agricultural production

Introduction

In Poland, there are over 146,000 8-16 ESU sized functioning farms. Approximately 55% of them are specialised farms, and the other 45% are farms characterised by many-sided production [GUS (Central Statistical Office) 2008]. These numbers indicate that both groups of farms play a significant role in Polish agriculture. The basic advantages of the former ones are: more efficient machine stock operation, more effective use of production infrastructure, and easier acquisition of information facilitating management. On the other hand, the farm's specialisation in the production of one leading article is to larger extent exposed to production and economic risks [Jerzak 2007]. Currently, direct surplus plays a leading role in the assessment of production activity carried out by small-sized, family-operated farms [Augustyńska-Grzybek et al. 1999]. It may be estimated if we know e.g.: arable land (AL) structure, livestock density, provided services and other incomes. However, it should be added that in the methodology recommended by the EU, the value of by-products is not taken into account in order to simplify surplus calculation, which has a particularly adverse impact on the animal production balance. Thus, it gives no possibility to assess employed plant and animal production technologies [Wójcicki 2007].

The purpose of this work is to determine the economic size of the examined farms, taking into account European Union subventions acquired in the scope of the so-called direct payments (financed by European Guarantee Fund). Research results provided in this

publication contain introduction to detailed analysis concerning the European Union funds utilisation by the examined farms, where we intend to prove the significant role of technical equipment purchase. Therefore, in our next publication (“The European Union subventions and machine stock modernisation in the farm type aspect”) we will present the relations between the amount of acquired co-financing and the degree of machine stock revival. The scope of work covered 147 farms located within Southern Poland. Acquired source data concerned production year 2007/2008. When selecting farms for the research, the authors were trying to pick facilities diversified in their production orientation. Production direction was selected as the grouping variable - according to the classification principles for farms in the EU countries, it was an agricultural type of farm. The research was carried out as a directed survey interview.

Methodology of calculations

The examined farms were divided according to the production direction on the basis of generally applied typology of farms. This methodology allows to assign a given farm to an appropriate group in a very detailed way, according to the carried out agricultural production. Depending on required accuracy degree, the farm types are for example divided into: 9 general types; 17 basic types; 50 particular types; 31 subtypes [Augustyńska-Grzybek et al. 1999].

For the purposes of this work, the researchers limited themselves to classification within 9 general types, among which we distinguish farms:

1. Specialised in field crops;
2. Specialised in garden crops;
3. Specialised in permanent crops;
4. Specialised in rearing animals fed in grazing system;
5. Specialised in rearing animals fed with nutritive fodders;
6. Various crops together;
7. Various animals together;
8. Various crops and animals together;
9. Unclassified farms.

The farm's agricultural type is determined by the share of direct surplus for individual activity types in its general value for the whole farm. According to this criterion, farm type is reflected by its production system. In order to determine agricultural types, two threshold values of direct surplus for individual activities were used, i.e. $1/3$ and $2/3$.

The work involved carrying out an analysis of results obtained while taking into account the division into three of the above-mentioned 9 types, i.e. 6; 7 and 8. Farms classified in these types carry out various kinds of production (plant, animal). Direct surplus, according to which the farms were categorised into these types, is equal or less than $2/3$ (often, the threshold is $1/3$) of general direct surplus obtained by the farm.

The researchers calculated direct surplus and determined the economic size of farms in order to specify the efficiency of activities in the examined farms.

Economic size of farms...

Direct surplus (*DS*) was calculated using the following formula:

$$DS = FP_{gross} - DC_{m-s} + EUS \text{ [thousand PLN}\cdot\text{ha}^{-1}\text{AL]}$$

where:

- FP_{gross} – annual value of final gross production obtained from plant and animal production,
- DC_{m-s} – direct costs for effecting this production,
- EUS – EU subventions, i.e. direct subsidies.

The economic size of farm was determined as a sum of direct surplus values for all activities occurring in a farm, and expressed using the European Size Unit (ESU). This unit constitutes an equivalent of 1200 Euro (assumed annual average foreign currency exchange rate: 1 Euro = 3.52 PLN [NBP currency exchange rate (*on-line*)]). Specifying farm economic size in the ESU allowed to classify the examined farms in one of ten size categories, and assign suitable nomenclature (Tab. 1) [Augustyńska-Grzybek et al. 1999].

Table 1. Farm economic size categories

Farm economic size categories	Size of farms in the ESU	Nomenclature for farm category sizes
I	Under 2;	Very small
II	2-4	
III	4-6	Small
IV	6-8	
V	8-12	Medium-small
VI	12-16	
VII	16-40	Medium-large
VIII	40-100	Large
IX	100 and more	Very large

Source: [Augustyńska-Grzybek et al. 1999]

Examined farms characteristics

Among the 147 examined farms, the least numerous group, less than 11% (16), consisted of objects oriented to animal production - i.e. type 7, (Tab. 2). Two other groups turned out to be comparable in number, i.e. mixed production farms (type 8 - 64 farms) and one-sided, plant production-oriented farms (type 6 - 67 farms).

Data provided in Table 2 characteristic for farms categorised into three general types show correct relations both as regards arable land area and livestock density. Largest farms represent plant-oriented production. Whereas, farms guaranteeing alike profitability that represent higher processing level for farm produce, classified into animal-oriented production, have more than twice lower arable land area. When analysing data contained in Table 2, one may observe that no production in monoculture system is confirmed in the examined farms.

Table 2. Agricultural production characteristics in the examined farms

Specification	On average	Farms according to general type		
		6	7	8
Area of arable land, grounds and crops [ha]				
Arable land	23.39	31.25	14.47	17.39
in this: cereals	17.52	23.50	11.26	12.84
roots	3.00	3.73	1.27	2.67
industrial	1.96	2.95	0.88	1.18
vegetables	0.04	0.08	-	-
fodder crops	0.87	0.99	1.06	0.70
Grassland	0.89	0.99	0.76	0.81
Orchards and plantations	0.16	0.17	0.13	0.15
Agricultural land	24.44	32.42	15.35	18.36
Livestock density [large conversion unit·ha ⁻¹ AL]				
Cattle	0.22	0.16	0.50	0.22
Swine	0.32	0.13	0.74	0.57
Poultry	0.05	0.00	0.20	0.09
Livestock	0.59	0.29	1.45	0.89

Results

In order to assess the management efficiency, the researchers prepared the balance of acquired direct surplus, starting from calculation of final gross production value, which, in total for the whole group of examined farms, was 7.00 thousand PLN·ha⁻¹AL, on average (Tab. 3). Highest value amounting to 11.83 thousand PLN·ha⁻¹AL was reached by animal production-oriented farms. It was almost twice higher than in type 6 objects, i.e. plant production-oriented ones. While analysing the results obtained in mixed production farms (8 types), one may observe that despite the lack of production specialisation, the proportions kept between plant and animal production seem to be correct. However, the total obtained final production value i.e. 8.21 thousand PLN·ha⁻¹AL, which for average arable land area reaching 18.36 ha per farm in this group is ca. 17% lower than previous ones, gives 150.73 thousand PLN·farm⁻¹.

Carried out agricultural production inextricably involves outlays that must be incurred to obtain results in form of crops and their products. In case of examined farms, independently of farm type, the outlays incurred for plant production were similar, ranging within 1.04-0.99 thousand PLN·ha⁻¹AL. In each of the separated groups, the highest costs were incurred for purchasing mineral fertilisers (ca. 50% of total expenditures in plant production). Unit outlays incurred in animal production proved the regularity that for this production direction, intensification of production inextricably involves increase in the production costs. Results obtained in type 7 farms may be used as the example, where the value of these outlays with reference to one hectare reached as much as 5.14 thousand PLN. While analysing the relations between own expenditures and purchases, it is visible that in the last two groups they oscillated at approximately 50% (Tab. 4).

Economic size of farms...

Table 3. Final gross production [thousand PLN·ha⁻¹AL]

Specification	On average	Farms according to general type		
		6	7	8
Obtained from plant production				
Arable land	3.74	4.22	2.54	3.08
in this:				
cereals	3.28	3.62	2.51	2.79
roots	4.84	4.94	3.65	4.85
industrial	9.10	12.63	3.06	6.16
vegetables	21.30	17.10	-	-
fodder crops	9.10	12.63	3.06	6.16
Grassland	1.65	1.65	2.21	1.53
Orchards and plantations	13.26	19.22	2.40	8.44
Plant production in total	3.73	4.23	2.53	3.06
Obtained from animal production				
Cattle	0.63	0.46	1.09	0.63
Swine	2.18	0.91	5.51	3.77
Poultry	0.46	0.04	2.70	0.75
Animal production in total	3.27	1.42	9.30	5.15
Total	7.00	5.65	11.83	8.21

Table 4. Direct outlays [thousand PLN·ha⁻¹AL]

Specification	On average	Farms according to general type		
		6	7	8
Incurred in plant production				
Own	0.06	0.06	0.06	0.07
Purchased	0.96	0.98	0.98	0.92
in this:				
sowable material	0.11	0.13	0.07	0.09
mineral fertilisers	0.56	0.59	0.49	0.51
plant pesticides	0.20	0.20	0.25	0.21
other	0.08	0.06	0.17	0.11
Total plant production	1.02	1.04	1.04	0.99
Incurred in animal production				
Own	1.13	0.65	2.42	1.73
Purchased	0.94	0.22	2.73	1.87
in this:				
fodders	0.71	0.13	2.11	1.46
livestock	0.14	0.03	0.44	0.30
other	0.09	0.06	0.17	0.11
Total animal production	2.07	0.86	5.14	3.60
Total	3.09	1.90	6.18	4.59

An estimated direct surplus level in the examined farms takes into account the value of acquired European Union funds in form of direct subsidies. From individual point of view, the level of obtained subventions was very similar, that is ca. 0.50 thousand PLN·ha⁻¹AL. This results from the lack of significant crop structure diversification. As everybody

knows, apart from the above-mentioned structure, the level of acquired subsidies in relation to an entire farm is determined by the possessed land area. Thus, highest subsidies were obtained in the first group (Tab. 5).

Table 5. Direct surplus taking into account direct subsidies

Specification	On average	Farms according to general type		
		6	7	8
Direct surplus [thousand PLN·ha ⁻¹ AL]	4.43	3.98	7.54	4.62
in this				
plant production	2.70	3.19	1.48	2.07
animal production	1.18	0.25	5.56	1.99
direct subsidies	0.55	0.54	0.50	0.57
Direct surplus [thousand PLN·farm ⁻¹]	108.29	128.89	115.83	84.84
in this				
plant production	66.10	103.32	22.79	37.97
animal production	28.82	8.00	85.41	36.48
direct subsidies	13.36	17.67	7.63	10.39

The most favourable management effect expressed as direct surplus value was obtained in the plant production-oriented farms. Its total value reached 128.89 thousand PLN·farm⁻¹. However, from individual point of view the best result was achieved by type 7 farms, i.e. 7.54 thousand PLN·farm⁻¹. This is the effect of previously mentioned production intensification. Expressing direct surplus in ESU allows to determine the economic vitality and assign farms to proper economic size categories. Independently of the assumed division according to the management type, the examined farms carry out so efficient agricultural production that it is possible to rank them among the medium-large objects (Tab. 6). This is so because in each of the examined groups obtained ESU value exceeded 4 ESU, and thus these were economically vital farms. With a determined economic size, these farms were classified according to the accepted size category nomenclature in economic size category VII (among IX available).

Table 6. Economic size of examined farms

Specification	On average	Farms according to general type		
		6	7	8
ESU value	25	30	27	20
Economic size category	VII	VII	VII	VII
Classification group	medium-large	medium-large	medium-large	medium-large

In evaluation of farms percentage, medium-large farms were prevailing in each of the three separated groups, ranging from 50.0 to 29.9% - in the whole test they constituted 34% (Fig. 1).

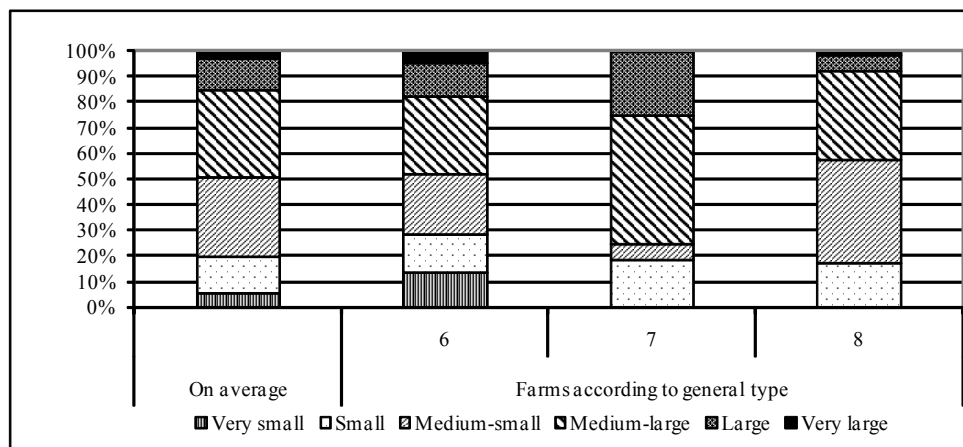


Fig. 1. Percent structure of the share of individual farm classification groups

Summary

Obtained results allow to conclude that the production direction may be the determinant of the acquired direct surplus value (constituting the basis for economic size determination). In case of the examined objects, type 7 farms reached the average highest value of direct surplus, i.e. 7.5 thousand PLN·ha⁻¹AL. It was 3.5 thousand PLN·ha⁻¹AL higher compared to type 6 plant production-oriented farms. Economic size of examined farms, on average reaching 25 ESU for mean land area 24.44 ha and livestock density of 0.59 large conversion units·ha⁻¹AL, allows to conclude that agricultural production carried out in the examined farms positively translates into management efficiency. Acquired direct subsidies amounting to 7.63-17.67 thousand PLN·farm⁻¹ allow to compensate for the value of incurred direct outlays to a large extent.

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EKONOMICZNA WIELKOŚĆ GOSPODARSTW ROLNICZYCH ORAZ POZIOM UZYSKANYCH DOPLAT BEZPOŚREDNICH A UKIERUNKOWANIE PRODUKCJI

Streszczenie. W pracy podjęto próbę określenia ekonomicznej wielkości 147 badanych gospodarstw rolnych, uwzględniając przy tym subwencje unijne uzyskane w ramach tzw. płatności bezpośrednich (finansowanych z Europejskiego Funduszu Gwarancji). Przedmiotem pracy objęto gospodarstwa zlokalizowanych na terenie Polski Południowej. Uzyskane wyniki pozwalają wnioskować, iż kierunek produkcji może być determinantą uzyskanej wartości nadwyżki bezpośredniej. Pozyskiwane dopłaty bezpośrednie na poziomie 7,63-17,67 tys.zł·gosp.⁻¹ pozwalają rekompensować wartość ponoszonych nakładów bezpośrednich.

Słowa kluczowe: typ rolniczy gospodarstwa, nadwyżka bezpośrednia, dopłaty bezpośrednie, produkcja rolnicza

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