Economic situation of agricultural holdings supported within the Rural Development Programme (RDP) for 2007–2013

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Introduction

Poland's accession to the European Union was the main cause of increase in the number of agricultural holdings that are able to compete on the domestic and the European market. According to W. Józwiak and W. Ziętara [Central Statistical Office 2012], in 2010, there were ca. 295 thousand such farms, which is ca. 2.5 times more than in the pre-accession period. It is alarming though that many other farms reacted to the new conditions in a different way. While 18.8 percent of all agricultural holdings with over 1 ha of utilised agricultural area used this opportunity to increase the specialisation of their production, introduce innovations and improve the quality of production, many other farms discontinued, reduced their agricultural activity or developed it insufficiently. This unfavourable situation was above all due to the backwardness of their production infrastructure, failure to adjust the scale and quality of production to market requirements and, frequently, the lack of sufficient knowledge, skills and agricultural passion of farm managers.

Although the number of competitive agricultural holdings has increased in the recent years, their share in the total number of farms is still minor. Further support for agricultural holdings seems, therefore, necessary. This includes the '*Modernisation of agricultural holdings*' measure under Axis 1: Improving the competitiveness of the agricultural and forestry sector, which is a part of RDP 2007–2013. Nevertheless, in order to consider this measure one that increases the economic strength of agricultural holdings, we need to determine the level of achievement of its objective, which in Poland, in accordance with the suggestion of the European Commission, is an increase in gross value added – GVA (UE 2006).

Method of analysis

This study is already the third one that aims at verifying the level of achievement of this objective. The first one was a part of the *'Mid-Term Evaluation of the Rural Development Programme for 2007–2013*'. The study was based on survey data acquired from the beneficiaries of the '*Modernisation of agricultural holdings*' measure in 2007 and 2009 (Ministry of Agriculture and Rural Development – MARD 2010). These data allowed for calculating the increase in gross value added in 2009. The second study was based on the data of the Polish Farm Accountancy Data Network (Polish FADN). Two panel groups of agricultural holdings keeping continuous accounts were selected in 2009, 2010 and 2011. The first group consisted of agricultural holdings that benefited in 2008 from the '*Modernisation of agricultural holdings*' measure. The second group comprised farms which were eligible for support[1] under this measure, but did not use it in 2008 (MARD 2011). This study, in turn, evaluates the effects of implementation of the '*Modernisation of agricultural holdings*' measure in Polish agriculture in 2009, 2010 and 2011.

The analysis covers the evaluation of the production potential, production system, management gains, the rate of fixed assets reproduction and the increase in gross value added among the beneficiaries of the '*Modernisation of agricultural holdings*' measure in 2009–2011 against the backdrop of other agricultural holdings.

In order to assess the production potential, production system, costs broken down by type and the productivity and efficiency of operation of the selected groups of farms, the following variables and indicators were used:

1. Production potential:

- utilised agricultural area expressed in ha, consisting of owned land, land leased for a year or longer, land used on the condition of sharing the harvest with the owner, as well as fallow and uncultivated land;
- the share of leased land (%) expressed as the area of land leased by a holder under a tenancy agreement for a period of at least a year;
- total labour input as the total amount of human labour involved in the investments of an agricultural holding expressed in AWUs (1 Annual Work Unit = 2200 hours of labour per year);
- total value of assets calculated per 1 ha of utilised agricultural area of an agricultural holding (PLN/ha);
- total value of assets calculated per 1 person employed on a full-time basis in an agricultural holding (PLN/AWU);

[1] Ordinance of the Minister of Agriculture and Rural Development of 17 October 2007 on the detailed conditions and mode of granting financial aid under the 'Modernisation of agricultural holdings' measure within the Rural Development Program for 2007–2013.

- share of fixed assets in total assets (%).

2. Production system and structure:

- share of cereals in UAA (%);
- stocking density (LU/100ha of UAA);
- share of crops, livestock and other output in total output (%).

3. Costs broken down by type:

- total inputs (PLN/ha) including specific costs, farming overheads, depreciation and external factors;
- specific costs (PLN/ha) including: crop-specific costs (seeds and plants, fertilisers, crop protection, other crop-specific costs), livestock-specific costs (fodder for grazing livestock and granivores, other livestock-specific costs) and forestry-specific costs;
- farming overheads (PLN/ha) linked to production activity but not linked to specific lines of production, including: machinery and building current costs (costs of equipment maintenance, car expenses, building and melioration equipment maintenance, building insurance), energy (motor fuels, lubricants, electricity, heating fuels), contract work (wages paid), rent paid (machine hiring), other farming overheads (water, insurance other than building insurance and insurance against accidents at work, third party liability insurance) and other farming overheads incurred as a part of the current operations of an agricultural holding (e.g. bookkeeping or telephone charges);
- depreciation of capital assets (PLN/ha) determined on the basis of replacement value; this relates to multiannual plantations, buildings and fixed equipment, melioration equipment, machinery and tools;
- external factors (PLN/ha): remuneration of inputs (work, land and capital) which are not the property of the holder. These costs include: wages and social security charges of wage earners, rent for the lease of land and buildings, costs of lease fees, interest and financial charges paid for credits obtained for the purchase of land, buildings, machinery and equipment, livestock and materials.

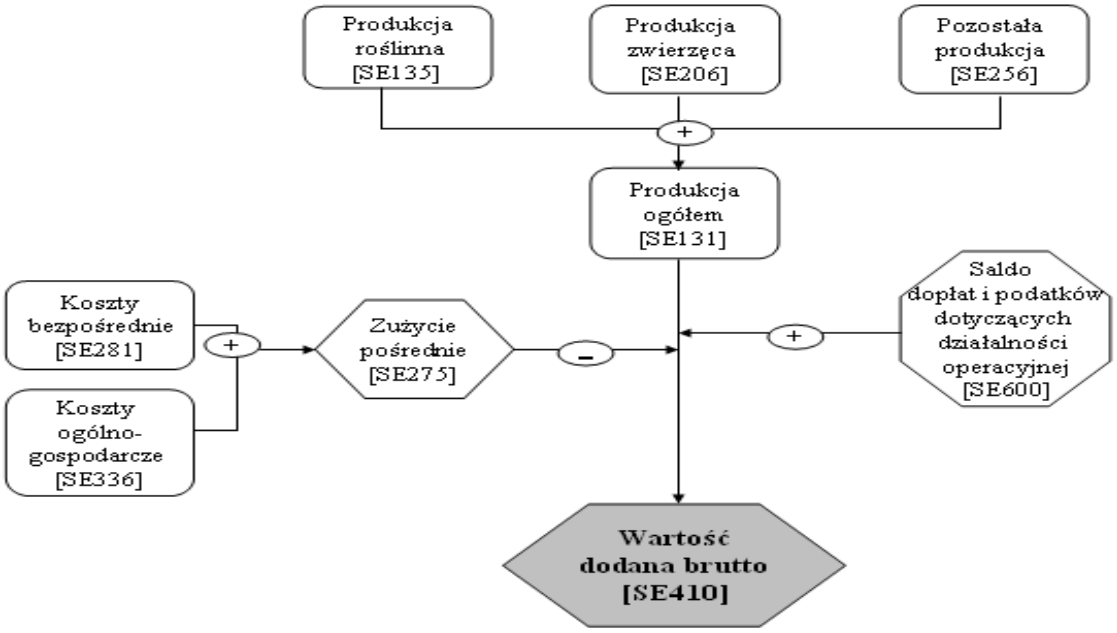
4. Productivity and effectiveness of agricultural holdings:

- land productivity (PLN/ha), expressed as a ratio of the value of total output of a farm to the utilised agricultural area;
- fixed-assets productivity (times), expressed as a ratio of the value of total output of a farm to the value of its fixed assets;
- current-assets productivity (times), expressed as a ratio of the value of total output of a farm to the value of its current assets;

- labour efficiency (PLN/AWU), expressed as a ratio of the value of total output of a farm to the number of people employed on full-time basis;
- land profitability (PLN/ha), expressed as a ratio of income from a farm to the utilised agricultural area;
- assets profitability (%), expressed as a ratio of income from a farm to the value of total assets.
- profitability of own work (PLN/FWU), expressed as a ratio of income from a farm to own labour input;
- rate of fixed assets reproduction (%), expressed as a ratio of net investments to the value of fixed assets including utilised agricultural area, agricultural holding facilities, forest plantations, machinery and equipment, as well as the breeding livestock;
- debt rate (%), expressed as a ratio of all long-, medium- and short-term loans still to be repaid as of the end of the accounting year to the total value of assets.

In the research on the increase in gross value added, methodology applied in the *'Mid-Term Evaluation of the Rural Development Programme for 2007–2013'* was adopted, which is consistent with FADN methodology. In this methodology, gross value added of a farm is the value of total output less intermediate consumption and adjusted for the balance of current subsidies and taxes. Total output is the sum of the value of crops and crop products, livestock and livestock products and of other output, that is sales, allocation to household consumption, consumption by the agricultural holding, change in the stocks of products and change in the valuation of livestock. Intermediate consumption comprises specific costs (including inputs produced on the agricultural holding) and farming overheads arising from production in the accounting year. Balance of current subsidies and taxes encompasses subsidies and taxes arising from current productive activity in the accounting year. The balance of subsidies and taxes on current operations includes subsidies and VAT balance of operations less farm taxes.

Figure 1. Calculation of gross value added in the methodology of Polish FADN



PL	EN
Produkcja roślinna [SE135]	Total output crops & crop production [SE135]
Produkcja zwierzęca [SE206]	Total output livestock & livestock products [SE206]
Pozostała produkcja [SE256]	Other output [SE256]
Produkcja ogółem [SE131]	Total output [SE131]
Koszty bezpośrednie [SE281]	Total specific costs [SE281]
Koszty ogólnogospodarcze [SE336]	Total farming overheads [SE336]
Zużycie pośrednie [SE275]	Total intermediate consumption [SE275]
Saldo dopłat i podatków dotyczących działalności operacyjnej [SE600]	Balance of current subsidies & taxes [SE600]
Wartość dodana brutto [SE410]	Gross farm income (Gross value added) [SE410]

Source: 'Standard results obtained by individual agricultural holdings participating in Polish FADN in 2009', IAFE – NRI, Warsaw, 2011.

Two panel groups of agricultural holdings keeping accounts were selected from the data of Polish FADN in 2009, 2010 and 2011. The first group consisted of agricultural holdings that benefited in 2009 from the '*Modernisation of agricultural holdings*' measure. The second group comprises farms which did not implement the measure in spite of being eligible for the aid.

In order to determine the increase in gross value added in agricultural holdings taking part in measure 121, the following variables were applied: minimum economic farm size of 4 ESU, owner's age, eligible investment costs exceeding PLN 20,000,

maximum subsidy of PLN 300,000, subsidies to be allocated to the start of permanent cultivation, construction/capital renovation of melioration, construction/capital renovation of buildings and other facilities and purchase/capital renovation of vehicles, machinery, equipment. What is important, the subsidies were broken down subject to the methodology applied by Polish FADN.

The production system and potential, level of costs and results of farms of the beneficiaries of measure 121 in 2009 in comparison to the owners of other farms in 2009–2011

The production potential in both groups in 2009–2011 is shown in Table 1.

The agricultural holdings of the beneficiaries of measure 121 had average labour input of 2.3 AWU, and the farms in the control group had lower labour input: 2.0 AWU.

The average utilised agricultural area in the farms of the beneficiaries of measure 121 was 66.9 percent larger than the area of land of other farms. The same situation applied to the share of leased land in the total utilised agricultural area. This time the difference was 3.7 percentage points in favour of the first group.

Table 1

Production potential of farms – beneficiaries of measure 121 in 2009 in comparison to the other farms in 2009–2011

Variable	Unit	Agricultural holdings:		Difference in percentages [(3-4)/4]*100
		taking part in measure 121	other	
1	2	3	4	5
Utilised agricultural area	ha	59.1	35.4	66.9
Share of leased land	%	34.8	31.1	3.7*
Total labour input	AWU	2.29	2.02	4.3
Total assets per 1 ha of UAA	PLN/ha	21,262	18,533	13.4
Total assets per 1 FTE	PLN/AWU	548,576	325,095	68.7
Share of fixed assets in total assets	%	82.9	80.8	2.1*

* difference in percentage points (3–4)

Source: Authors' own compilation based on FADN data.

The level of technical infrastructure measured with the value of total assets per 1 ha of UAA was 13.4 percent higher in the farms of the beneficiaries of measure 121. Also calculated per one FTE (AWU), it was 68.7 percent higher than in other farms, where it amounted to 325,095 PLN/AWU. The majority of assets consisted of fixed assets. Their share in the farms of the beneficiaries of measure 121 was 82.9 percent, and in

the other farms nearly 82.0 percent. In both groups, the remaining assets were current assets comprising non-breeding livestock and operating capital (stock of agricultural products and other current assets). What is important, both groups of farms based their activity on fixed assets.

Table 2 presents numbers characterising the production system and structure within both groups of farms. Cereals played an important part in crops. Their share in the utilised agricultural area in the farms of the beneficiaries of measure 121 was 56.6 percent and was 2.3 percentage points smaller than in the other farms.

Table 2

Production system and structure in farms – beneficiaries of measure 121 in 2008 in comparison to the other farms in 2008–2010

Variable	Unit	Agricultural holdings:		difference in percentage points (3–4)
		taking part in measure 121	other	
1	2	3	4	5
Share of cereals in the area of UAA	%	56.6	58.9	-2.3
Stocking density	LU/100 ha of UAA	123.7	144.6	-14.4*
Total output, including:	%	100	100	-
- crops and crop production	%	50.2	50.6	-0.4
- livestock and livestock products	%	49.0	48.6	0.4
- other output	%	0.8	0.8	-

*difference in percentages ((3-4)/4)*100

Source: Authors' own calculations based on the Polish FADN.

Stocking density expressed as Livestock Units (LU) per 100 ha of UAA in the farms of both groups was 123.7 and 144.6 LU/100 ha of UAA respectively. This means that its level did not threaten the natural environment.

Crop structure and stocking density determine production structure. Both in the farms of the beneficiaries of measure 121 and in the other farms, crop production slightly prevailed (50.2%–50.6%), and livestock production stood for ca. 49 percent. The share of other output in both groups of farms did not exceed 1 percent.

Differences in production costs were observed between the two groups of farms. Relevant numbers are provided in Table 3. Total costs per 1 ha of UAA in the farms of the beneficiaries of measure 121 amounted to PLN 5058.0 and were (7.1 percent) higher that the costs borne by the other farms. The same situation applied to all other costs. Specific costs and farming overheads were respectively 4.8 and 2.5 percent higher, and the costs of depreciation and external factors respectively 12.0 and 29.3 percent higher.

Table 3

Level and types of costs in farms – beneficiaries of measure 121 in comparison to the other farms

Variable	Unit	Agricultural holdings:		Difference in percentages [(3-4)/4]*100
		taking part in measure 121	other	
1	2	3	4	5
Total costs	PLN/ha	5,058	4,722	7.1
Specific costs	PLN/ha	2,737	2,611	4.8
Farming overheads	PLN/ha	1,020	995	2.5
Depreciation	PLN/ha	922	823	12.0
External factors	PLN/ha	379	293	29.3

Source: Authors' own calculations based on the Polish FADN.

Table 4 shows the indexes of productivity and economic effectiveness of farms in both analysed groups.

Land productivity in the farms of the beneficiaries of measure 121 was 3.5 percent greater than in the other farms. In the other farms, on the other hand, assets productivity was greater. It amounted to 0.39, which means that 1 PLN of assets provided a yield of PLN 0.39, while in the farms of the beneficiaries this index was 0.35. There were two reasons for that. The first reason was a smaller value of total output in the farms of the beneficiaries, and the second was a smaller value of assets. The case of current assets productivity and labour efficiency was reversed. In the farms of the beneficiaries of measure 121, they were respectively 1.2 and 52.3 percent greater than in the other farms.

Another area of the economic evaluation was the profitability of land, assets and own labour input. Land profitability measured with the amount of income from an agricultural holding per 1 ha of UAA was 2.3 percent higher in the farms of the beneficiaries of measure 121. In the case of assets profitability, the difference was also minor (1.1 percentage points) in favour of the other farms.

Own labour profitability (FWU) was diversified in both groups of farms. Nevertheless, once again farms taking part in measure 121 were in the lead, with 85.6 percent greater income per 1 FWU than the other farms.

Table 4

Productivity and economic effectiveness of farms – beneficiaries of measure 121 in comparison to the other farms

Variable	Unit	Agricultural holdings:		Difference in percentages [(3-4)/4]*100
		taking part in measure 121	other	

1	2	3	4	5
Land productivity	PLN/ha	6,161	5,953	3.5
Fixed assets productivity	times	0.35	0.39	-10.5
Current assets productivity	times	1.69	1.67	1.2
Labour efficiency	PLN/AWU	159,168	104,516	52.3
Land profitability	PLN/ha	2,305	2,254	2.3
Assets profitability	%	10.8	11.9	-1.1*
Own labour profitability	PLN/FWU	75,700	40,970	85.6
Rate of fixed assets reproduction	%	8.4	1.8	6.6*
Debt ratio	%	16.7	13.6	3.1*

* difference in percentage points (3–4)

Source: Authors' own compilation based on FADN data.

Both groups were characterised with an extended reproduction of fixed assets (8.4 and 1.8% respectively), which shows their greater development capacities in the future.

Farms in both groups carried out investment projects with own resources, which is confirmed by a minor share of foreign capital in their assets amounting to 16.7 and 13.6 percent respectively.

Increase in gross value added in 2010 and 2011 in the farms of the beneficiaries of measure 121 in 2009 in comparison to the other farms

Table 10 presents the indexes of gross value added in 2009, 2010 and 2011 and its components in the farms of the beneficiaries of measure 121 in 2009 in comparison to the other farms.

Differences in the dynamics of growth of gross value added were observed between the farms of the beneficiaries of measure 121 and the other farms. In the first group, the increase in gross value added in relation to 2009 was 24.9 and 43.4 percent in 2010 and 2011 respectively. In the other farms, the increase was 23.8 percent in 2010 and 42.6 percent in 2011.

In the farms of the beneficiaries of measure 121, the increase in gross value added in 2010 was due to 16.9 percent increase in the value of total output, including 33.3 percent increase in crops and crop production. It is also worth noting that the output of livestock and livestock products in the discussed period increased by 2.8 percent. Other output also increased, but its share in the structure of total output was minor.

It is worth noting that (5.7 percent) greater intermediate consumption in 2010 in relation to the preceding year limited the increase in gross value added in the farms of

the beneficiaries of measure 121. Over the year, both their specific costs and farming overheads increased (by 4.1 and 10.0 percent respectively).

Moreover, in 2011, in this group, gross value added further increased (by 43.4 percent in relation to the base year). This time the increase in gross value added in relation to the base year was primarily due to 36.4 percent increase in the value of total output, including 51.8 percent increase in crops and crop production and 23.2 percent in livestock and livestock products output. There are various reasons behind this situation, including a higher quality of management and more knowledge about agricultural production of farm holders, as well as a favourable situation e.g. on the cereal market in the second half of 2011.

In the farms of the beneficiaries of measure 121, in 2010–2011, the balance of current taxes and subsidies increased (by 16.0 percent). Intermediate consumption including specific costs and farming overheads was also (respectively 24.5%, 23.9% and 26.1%) greater than two years ago.

This means that both in 2010 and in 2011, the planned objective in the form of an increased gross value added was achieved in the farms of the beneficiaries taking part in measure 121 in 2009.

Table 5

Gross value added and its components (PLN/farm)

Specification	Unit	Year 2009		Year 2010		Year 2011	
		Agricultural holdings:					
		Beneficiaries of 121	Other	Beneficiaries of 121	Other	Beneficiaries of 121	Other
Total output, including:	PLN	310,094	182,821	262,573	202,602	422,888	238,708
- crops and crop production	PLN	143,594	86,347	191,412	106,451	217,957	1,239,123
- livestock and livestock products	PLN	164,151	94,803	168,650	94,638	202,290	113,076
- other output	PLN	2,348	1,671	2,511	1,512	2,641	1,720
Intermediate consumption including:	PLN	202,144	120,063	213,667	118,656	251,594	140,084
- specific costs	PLN	148,233	87,857	154,362	84,631	183,631	101,542
- farming overheads	PLN	53,911	32,206	59,305	34,025	67,963	38,542
Balance of current subsidies and taxes	PLN	60,062	33,766	60,892	35,610	69,649	39,095
Gross value added	PLN	168,012	96,524	209,798	119,556	240,943	137,720
Increase in gross value added (Year 2008 = 100%)	%	-	-	124.9	123.8	143.4	142.6

Source: Authors' own compilation based on FADN data.

The situation was similar in the case of the other farms. Their gross value added in 2010 was 23.8 percent greater than in the base year. Over a year, the value of total output increased by 10.8 percent, and intermediate consumption decreased by 1.2 percent. It needs to be emphasised that in this group of farms, the increase in gross value added in 2010 was due to the increase in the value of total output, including 23.3 percent increase in crops and crop production and 5.5 percent increase in the balance of subsidies and taxes on current operations.

In 2011, gross value added in the other farms increased from 2009 to 2011 (by 42.6 percent). This was primarily due to a considerable increase in the value of total output (30.6 percent), including crops and crop production (43.5%) and livestock and livestock products (19.3 percent), and secondarily to the increase in the balance of subsidies and taxes on current operations. This balance increased in relation to 2009 by 15.8 percent. At the same time, intermediate consumption increased by 16.7 percent, mainly due to the farming overheads, which increased by 19.7 percent. Specific costs increased in 2011 by 15.6 percent.

Summary

The analysis aimed at evaluating gross value added and its increase in 2010 and 2011 in the farms which took part in 2009 in the 'Modernisation of agricultural holdings' measure (measure 121).

The study was based on the data of the Polish FADN. For this purpose, two panel groups of agricultural holdings keeping continuous accounts were selected in 2009, 2010 and 2011. The first group consisted of agricultural holdings that benefited in 2009 from measure 121 exclusively. The second group comprised farms which did not benefit from the measure in 2009 in spite of being eligible for the aid.

Gross value added in the farms which took part in 2009 in the 'Modernisation of agricultural holdings' measure (measure 121) was higher in 2010 and 2011 than in 2009.

Their gross value added increased in relation to the base year by 24.9 percent and 43.4 percent respectively. In comparison, in the control group of farms, this value increased in 2010 by 23.8 percent and in 2011 by 42.6 percent. In the farms of the beneficiaries of measure 121, the increase in GVA in 2010–2011 in relation to the base year (2009) was primarily due to the increase in the value of output, in particular the increase in the value of crop output. The increase in the balance of current subsidies and taxes was of minor significance. Investments carried out under measure 121 consisting mainly in the purchase of machinery and equipment probably had a positive impact on the increase in output. Equipment improvement had a favourable impact on the enhancement of quality and increase in the harvest of agricultural products,

perhaps due to a better organisation of work in the farms. First measurable effects were visible already in the second year after the receipt of subsidies to investments carried out by the agricultural holdings.

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