ISSN 1899-5772

Journal of Agribusiness and Rural Development

www.jard.edu.pl

1(11) 2009, 177-188

THE OUTPUT, INCOMES AND ASSETS-CAPITAL RELATIONS IN THE INDIVIDUAL FARMS

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Abstract. In this article an attempt was made to analyse the output, incomes as well as other components of assets and sources that provided their financing in Polish individual farms, in comparison with farms from other EU countries. A special emphasis was put on examination of the interrelations between income, output and stocks observed within individual farms. Research was based on the FADN database that included basic information about average individual farms in years 2004-2006. The research showed, that (among other things) the average output and family farm income were three times lower in Poland than the average in the Union. Also the increase of income was possible only thanks to the subsidies from the Union. According to the regression models, in Poland the positive influence on the increase of family farm income had stocks, crops and livestock output. While in the EU positive influence had crops and livestock production and negative influence had the stocks on an income's growth.

Key words: income, output, balance sheet, stocks

INTRODUCTION

The production is the essence of the agribusiness. However, the factor that distinguishes the agricultural production from other types of production is the constant selling of agricultural products in order to replace utilised factors of production [Poczta and Średzińska 2007]. Setting of appropriate ratios of factors of production and their use in the production process become the most important elements of farms' management [Wasilewski 2004]. Decisions undertaken in this respect directly influence amount of

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individual farm‘s income[1]. Consequently, this amount achieved in a current period influences a level of consumption and the growth of production in the next period [Stępień 2007, Ryś-Jurek 2008]. All this information is indispensable to farms‘ management, so as to in the conditions of free-market economy their competitiveness will be improved, production‘s factors will be effectively used and the conditions to the development will be created.

On the one hand, the membership of Poland in the European Union (EU) creates an opportunity to the acceleration of development of individual farms, introducing and inducing changes in production and level of income [Tomczak 2004]. On the other hand, it forces individual farms to face up to the need of permanent increase in competitiveness, skilful factors of production and stocks management as well as costs cutting. [Gołaś and Kozera 2003, Wasilewski 2004].

The main aim of this article is to analyse the output, incomes as well as other components of the balance sheet observed in individual Polish farms in comparison with farms from other EU countries in the years 2004-2006. A special emphasis was put on examination of the interrelations between income, output and stocks in the individual farms. The latter variable was included, as it reflects the rationality of stocks management, being a way of costs cutting and increasing of farm‘s profitability of output.

MATERIAL AND RESEARCH METHODS

Research was based on data obtained from Farm Accountancy Data Network (FADN)[2]. Research was divided into two parts. In the first part, using an average data for a whole country, the Polish individual farm‘s balance sheets were analysed in comparison with average results calculated for EU farms. In the same way, the output and incomes of Polish and EU average individual farm were presented. The second part includes a research of interrelation between output, family farm income and level of stock of agricultural products in the individual farm. In this part, the data from more than 600 individual farms‘ types were used, according to the direction of production and to their economic size in the EU. A particular type of individual farm according to the direction of production and to the economic size, creates an aggregate unit. This average volume includes many individual farms with the same production‘s direction and economic size in each country in the EU [Ryś-Jurek 2008]. A whole database consists of 24 countries[3]. In order to maintain a maximum comparability between years 2004 and 2005, analysed set of farms according to the direction of production and to their economic size, consisted precisely of 615 units observed in both years. However, keeping the same comparability between years 2004-2005 and 2006 wasn‘t possible, because of the lack of information on

[1] The family farm income, with a highest degree of simplification, is defined as a difference between a value of total output and costs incurred in the given period [Stępień 2007].

[2] Data from network are not representative, but these data are at the moment the only available that can serve as a source of standardized information about farms in Poland. Then, with the abovementioned reservation, they can serve as a base for a comparison of Poland with other EU countries, while pondering the situation of agriculture [Ryś-Jurek 2008].

[3] There was no information about Malta in year 2004, so this country was excluded from further analysis.

10 countries in FADN database. As a consequence, a set of only 397 units was used as a base for research (Table 1)[4]. Moreover, the analysis only for Polish individual farms according to the direction of production and to the economic size was conducted. In the FADN database, 50 aggregate units represented them every year[5].

Table 1. Data selection for conducted research
Tabela 1. Dobór danych do przeprowadzonych badań

Analysed variables Analizowane zmienne	Type of average data Rodzaj danych przeciętnych	Information provenance in the years Pochodzenie informacji w latach		
		2004	2005	2006
Balance sheets, outputs, incomes Bilanse, produkcja, dochody	individual farm indywidualne gospodarstwo rolne	average for Poland średnia dla Polski average for EU-24: średnia dla UE-24: BEL, CYP, CZE, DAN, DEU, ELL, ESP, EST, FRA, HUN, IRE, ITA, LTU, LUX, LVA, NED, OST, POL, POR, SUO, SVE, SVK, SVN, UKI	average for Poland średnia dla Polski average for EU-25: średnia dla UE-25: BEL, CYP, CZE, DAN, DEU, ELL, ESP, EST, FRA, HUN, IRE, ITA, LTU, LUX, LVA, MLT, NED, OST, POL, POR, SUO, SVE, SVK, SVN, UKI	average for Poland średnia dla Polski average for EU-15: średnia dla UE-15: CYP, CZE, EST, FRA, HUN, ITA, LTU, LUX, MLT, OST, POL, POR, SUO, SVE, SVK
Relation between family farm income, farm's output and its level of agricultural products' stocks Związek między dochodem z gospodarstwa rolnego, produkcją gospodarstwa a jego stanem zapasów produktów rolniczych	individual farm's type according to the direction of production and to the economic size typ indywidualnego gospodarstwa rolnego według kierunku produkcji i wielkości ekonomicznej	615 types from 24 EU countries, including 50 types from Poland 615 typów z 24 krajów UE, w tym 50 typów z Polski	615 types from 24 EU countries, including 50 types from Poland[a)] 615 typów z 24 krajów UE, w tym 50 typów z Polski[a)]	397 types from 14 EU countries, including 50 types from Poland[a)] 397 typów z 14 krajów UE, w tym 50 typów z Polski[a)]

[a)]Without Malta.

BEL – Belgium, CYP – Cyprus, CZE – Czech Republic, DAN – Denmark, DEU – Germany, ELL – Greece, ESP – Spain, EST – Estonia, FRA – France, HUN – Hungary, IRE – Ireland, ITA – Italy, LTU – Lithuania, LUX – Luxembourg, LVA – Latvia, MLT – Malta, NED – The Netherlands, OST – Austria, POL – Poland, POR – Portugal, SUO – Finland, SVE – Sweden, SVK – Slovakia, SVN – Slovenia, UKI – United Kingdom.

Source: own elaborations.

[a)]Bez Malty.

BEL – Belgia, CYP – Cypr, CZE – Czechy, DAN – Dania, DEU – Niemcy, ELL –Grecja, ESP – Hiszpania, EST – Estonia, FRA – Francja, HUN – Węgry, IRE – Irlandia, ITA – Włochy, LTU – Litwa, LUX – Luksemburg, LVA – Łotwa, MLT – Malta, NED – Holandia, OST – Austria, POL – Polska, POR – Portugalia, SUO – Finlandia, SVE – Szwecja, SVK – Słowacja, SVN – Słowenia, UKI – Wielka Brytania.

Źródło: opracowanie własne.

[4] Consistently, Malta was excluded from this research.

[5] In the FADN database, Polish individual farms according to the direction of production and to the economic size are represented by more than 50 aggregate units in every year from analysed period. Taking into consideration the need of continuity and comparability of obtained results, only the data on farms that were continuously presented in FADN database within the years 2004--2006 were taken into account.

In the first part of research a descriptive and comparative analysis was used, as well as basic methods of descriptive statistics. The second part of research was supplemented by a regression, which was separately estimated for each year.

THE OUTPUT, INCOMES AND CHOSEN COMPONENTS OF BALANCE SHEETS OBSERVED IN AN AVERAGE INDIVIDUAL FARM IN POLAND AND IN THE EU

Before analysing balance sheets, which reflect Polish average individual farm's assets and sources that provide their financing in comparison with the EU average, the land resources and labour in these farms were characterized (Table 2). According to the average data, medium agricultural area of individual farm in Poland in 2004 year equalled to 15.8 hectares, whereas in the EU it amounted to 34.2 hectares. In the next years, this variable increased to 17.2 hectares in 2005 and to 17.3 in 2006 in Poland. At the same time, the average area of individual farm in the EU didn't change significantly[6]. In the years 2004-2006, Polish average individual farm achieved only ca 30% of economic size of the EU level. This value equalled to ca 10 ESU (Table 2). The medium labour inputs in Polish and EU farm were on the similar level (between 1.6 and 1.8 AWU).

Table 2. The average agricultural area, economic size and labour inputs in the individual farm in Poland and in the EU

Tabela 2. Przeciętna powierzchnia, wielkość ekonomiczna i nakłady pracy w indywidualnym gospodarstwie rolnym w Polsce i UE

Details Wyszczególnienie	Poland in the years Polska w latach			EU in the years UE w latach		
	2004	2005	2006	2004[a)]	2005	2006[b)]
Agricultural area (hectares) Powierzchnia gospodarstwa (ha)	15.8	17.2	17.3	34.2	34.3	32.6
Economic size (ESU)[c)] Wielkość ekonomiczna (ESU)[c)]	9.9	10.1	10.2	33.5	32.8	29.4
Labour inputs (AWU)[d)] Nakład pracy ogółem (AWU)[d)]	1.8	1.8	1.8	1.7	1.6	1.7

[a)]Without Malta.

[b)]Without 10 countries: Belgium, Denmark, Germany, Greece, Spain, Ireland, Latvia, The Netherlands, Slovenia and Great Britain.

[c)]ESU – European size unit.

[d)]AWU – Annual Work Unit.

Source: Own calculations based on FADN [2008] data.

[a)]Bez Malty.

[b)]Bez 10 krajów: Belgii, Danii, Niemiec, Grecji, Hiszpanii, Irlandii, Łotwy, Holandii, Słowenii i Wielkiej Brytanii.

[c)]ESU – Europejska jednostka wielkości.

[d)]AWU – roczna jednostka pracy.

Źródło: opracowanie własne na podstawie danych FADN [2008].

[6] For the sake of lack of data in the year 2006, the caution in interpretation of presented values was exercised.

As a result obtained from the analysis of balance sheets, it can be noticed that in years 2004-2006 the balance sum of Polish average individual farm increased only from 71 163 euro to 77 164 euro (Table 3). However, in each year these values achieved only c.a. 25% average levels observed in the EU. According to the FADN data, the fixed assets dominated in the structure of average individual farm's assets (both Polish and from the EU) – their average values amounted to c.a. 83% of balance sum's values. It can be interpreted as a result of specific character of the agricultural production. The running of this production requires usage of a large volume of tangible assets, but it freezes the capital. Whereas the seasonal leasing of the farm equipments is difficult, because at almost the same time every farm demands agricultural equipments. As a result, the high share of fixed assets makes the farm independent from the leasing firms. However, it decreases the farm's flexibility and increases its fixed costs [Poczta and Średzińska 2007]. In the analysed period, the value of machines and equipments in Polish average individual farm was equalled to c.a. 28% of fixed assets' value (this value was equalled average to 17 150 euro). At the same time, in the average farm from the EU the value of machines and equipments amounted to only c.a. 13% (with the value amounted about to 29 860 euro) of fixed assets' value (Table 3).

It is worth to notice the fundamental difference in the structure of fixed assets in average individual farm from Poland and from the EU. Almost 50% of the value of fixed assets in Polish average individual farm in years 2004-2006 was the buildings' value (on the average about 29 940 euro). Meanwhile, it was a value of land, permanent crops and production quotas that constituted more than 60% of the value of fixed assets in the average EU individual farm – on the average 128 190 euro (Table 3).

The considerable difference in the level and structure of current assets was observed while comparing the Polish average individual farm and the average individual farm from the EU. The average value of current assets in Polish farm in the year 2004 equalled to 10 776 euro, increasing to 13 006 euro in 2006, while in farm from the EU it amounted to 45 514 euro and 47 128 euro respectively. The structure of current assets was stable in the analysed period in Polish average individual farm as well as in average EU individual farm. The so-called other working assets had a highest share in this structure[7]. It was equalled to almost 43% of current assets in the Polish average individual farm (with the average value about 5050 euro), whereas in the average farm from the EU it equalled to 66% of these assets (with the average value 31 964 euro)[8]. The second element of a considerable share in the structure of current assets in Polish average individual farm was the stock of agricultural products[9]. Its average share in years 2004-2006 amounted to about 36% and the average value was about 4280 euro. In the average EU individual farm, this item achieved only ca 17% of current assets' value – with the average value 8420 euro (Table 3). It reflects the choice of type of stock management, as it can bring particular economic advantages for every farm. Too large stocks freeze capital, increasing the cost of storage. On the other hand, insufficient stocks can dampen

[7] The other working assets consist of the value of the cultivations while being sold standing, the farm's share in other agricultural units, the short-term dues and amount of the cash reserve. [Wyniki standardowe... 2006].

[8] The high level of data's aggregation is showed in this position, but more precise information about other current assets' components are unavailable in FADN database.

[9] In the FADN database, there was no information about stocks of non-agricultural products.

Table 3. The balance sheet of average individual farm in Poland and in the EU (euro)
Tabela 3. Bilans przeciętnego indywidualnego gospodarstwa rolnego w Polsce i w UE (euro)

Details Wyszczególnienie	Poland in years Polska w latach			EU in years UE w latach		
	2004	2005	2006	2004 [a)]	2005	2006 [b)]
Balance sum Suma bilansowa	71 163.0	73 186.0	77 164.0	267 372.0	287 878.0	222 008.0
Assets – Aktywa						
Total fixed assets, including: Aktywa trwałe, w tym:	60 387.0	61 666.0	64 158.0	221 858.0	236 084.0	174 880.0
land, permanent crops and quotas ziemia, uprawy trwałe i kwoty produkcyjne	13 774.0	10 844.0	12 574.0	141 345.0	152 084.0	91 131.0
buildings budynki	28 011.0	30 765.0	31 032.0	41 686.0	43 018.0	43 537.0
machinery maszyny i urządzenia	16 331.0	17 365.0	17 743.0	28 370.0	30 348.0	30 851.0
breeding livestock zwierzęta stada podstawowego	2 271.0	2 692.0	2 809.0	10 457.0	10 634.0	9 361.0
Total current assets, including: Aktywa bieżące, w tym:	10 776.0	11 520.0	13 006.0	45 514.0	51 794.0	47 128.0
non-breeding livestock zwierzęta stada obrotowego	2 207.0	2 532.0	2 572.0	7 965.0	8 231.0	7 099.0
stock of agricultural products zapasy produktów rolniczych	4 235.0	4 091.0	4 510.0	7 415.0	7 316.0	10 517.0
other circulating capital pozostałe aktywa obrotowe	4 334.0	4 897.0	5 924.0	30 134.0	36 247.0	29 512.0
Liabilities – Pasywa						
Total liabilities, including: Zobowiązania ogółem, w tym:	7 119.0	7 550.0	7 810.0	41 193.0	42 874.0	31 158.0
long and medium-term loans kredyty długo- i średnioterminowe	5 068.0	5 345.0	5 417.0	30 583.0	31 948.0	21 058.0
short-term loans kredyty krótkoterminowe	2 051.0	2 205.0	2 393.0	10 610.0	10 926.0	10 100.0
net worth kapitał własny	64 044.0	65 636.0	69 354.0	226 179.0	245 004.0	190 850.0

[a)]Without Malta.
[b)]Without 10 countries: Belgium, Denmark, Germany, Greece, Spain, Ireland, Latvia, The Netherlands, Slovenia and Great Britain.
Source: Own preparations and calculations based on FADN [2008] data.
[a)]Bez Malty.
[b)]Bez 10 krajów: Belgii, Danii, Niemiec, Grecji, Hiszpanii, Irlandii, Łotwy, Holandii, Słowenii i Wielkiej Brytanii.
Źródło: Opracowanie własne na podstawie danych FADN [2008].

the production and violation of contracts [Wasilewski 2004]. Then, one can suppose that Polish average individual farm was of weaker market position, and their production process was greatly supported with its own agricultural materials.

It can be noticed, that Polish average individual farm was also characterized by lower inclination to debt incurring than the average one in the EU (Table 3). The share of total liabilities in the balance sum didn't change in Polish average individual farm in years 2004-2006, equalling to c.a. 10%. In the EU, this ratio amounted to c.a. 15%.

In years 2004-2006, the medium total output in average Polish individual farm equalled to c.a. 22 000 euro, while the average individual farm from the EU achieved almost 60 000 euro of total output's value (Table 4). Additionally, the structure of Polish average individual farm's output was as follows (approximately): 50% – crops output, 48% – livestock output and 2% – other output. It was different than in the EU farms, where the same structure consisted of (approximately): crops output at 52%, livestock output at 43% and other output at 5%. While calculating the total output taking into account medium area of farm, in the analysed period Polish farms achieved only c.a. 75% of the level observed in the EU. Polish average individual farm obtained from 1 hectare of agricultural area total output amounting to c.a. 1325 euro, while an EU farm – c.a. 1755 euro (Table 4).

Table 4. Chosen average economic categories of individual farm in Poland and in the EU
Tabela 4. Wybrane przeciętne kategorie ekonomiczne dla indywidualnego gospodarstwa rolnego w Polsce i w UE

Details Wyszczególnienie	Poland in years Polska w latach			EU in years UE w latach		
	2004	2005	2006	2004[a)]	2005	2006[b)]
1	2	3	4	5	6	7
Total output, including (euro)[c)]: Produkcja ogółem, w tym (euro)[c)]:	21 077.0	22 307.0	23 269.0	61 471.0	60 941.0	55 118.0
total output crops and products produkcja roślinna	10 666.0	10 848.0	12 187.0	31 501.0	30 817.0	30 407.0
total output livestock and products produkcja zwierzęca	10 225.0	11 157.0	10 755.0	26 834.0	26 753.0	22 238.0
other output[d)] inna produkcja[d)]	186.0	302.0	327.0	3 136.0	3 371.0	2 473.0
Total output calculated on 1 hectare (euro/1 hectare) Produkcja ogółem w przeliczeniu na 1 ha (euro/1 ha)	1334.0	1296.9	1345.0	1797.4	1776.7	1690.7
Family farm income (euro) Dochód z gospodarstwa rolnego (euro)	6 398.0	7 292.0	9 073.0	18 111.0	17 836.0	17 931.0
Family farm income calculated on 1 hectare (euro/1 hectare) Dochód z gospodarstwa rolnego w przeliczeniu na 1 ha (euro/1 ha)	404.9	424.2	523.8	529.6	520.5	550.0

Table 4 – cont. / Tabela 4 – cd.

1	2	3	4	5	6	7
Family farm income without current subsidies (euro) Dochód z gospodarstwa rolnego bez bieżących dopłat (euro)	4 332.0	3 979.0	4 153.0	7 706.0	6 884.0	6 610.0
Family farm income without current subsidies calculated on 1 hectare (euro/1 hectare) Dochód z gospodarstwa rolnego bez bieżących dopłat w przeliczeniu na 1 ha (euro/1 ha)	274.2	231.5	239.8	225.3	200.9	202.8

[a)]Without Malta.
[b)]Without 10 countries: Belgium, Denmark, Germany, Greece, Spain, Ireland, Latvia, The Netherlands, Slovenia and Great Britain.
[c)]Total output is equal to sum of total crops, crops products, livestock and livestock products and of other output.
[d)]Other output – for example: leased land ready for sowing, forestry products, contract work for others, hiring out of equipment, etc.
Source: own preparations and calculations based on FADN [2008] data.
[a)]Bez Malty.
[b)]Bez 10 krajów: Belgii, Danii, Niemiec, Grecji, Hiszpanii, Irlandii, Łotwy, Holandii, Słowenii i Wielkiej Brytanii.
[c)]Produkcja ogółem to suma końcowej produkcji roślinnej, zwierzęcej i innej produkcji w gospodarstwie.
[d)]Inna produkcja – na przykład: produkcja z wydzierżawionej powierzchni lub produkty leśne lub zakontraktowana praca na rzecz innych, wynajem sprzętu, itp.
Źródło: opracowanie własne na podstawie danych FADN [2008].

Using absolute values, in the year 2004 the average Polish family farm income equalled to 6398 euro, in the year 2005 it increased to 7292 euro, while in the year 2006 it amounted up to 9073 euro. This growth was possible mainly due to the subsidies from the EU. While analysing the average family farm income without the subsidies, one can observe their decline from the level of 4332 euro in the year 2004 to 4153 euro in the year 2006. In the EU countries, family farm income and family farm income without subsidies were on higher level, however both variables decreased. The first variable fell from 18 111 euro in the year 2004 to 17 931 euro in the year 2006, and the second from 7706 euro to 6610 euro respectively (Table 4). The growth of the costs (among other things: total intermedial consumption, total external factors, depreciation) was the main reason of these incomes' decrease.

Using relative values, ratio of Polish average family farm income to 1 hectare of agricultural area in the analysed period was lower than the one observed in the EU. However, this difference was diminishing in the following years, equalling to c.a.: 125 euro, 96 euro and 26 euro. Nonetheless, while analysing the ratio of average family farm income without subsidies to 1 hectare of agricultural area, one can notice that Polish farms obtained higher values, than average EU farms. The difference amounted to ca 18% in the analysed period (Table 4).

THE INTERRELATION BETWEEN OUTPUT, LEVEL OF STOCKS AND FAMILY FARM INCOME

In a model, which describes the relations between family farm income and other variables, the value of crops output and livestock output are used very often [Wasilewski 2004]. However, in this research, the value of agricultural products' stock was added to these variables, because – as it was noticed – the rationality of stocks management is a way of costs cutting, leading to the increase of the farm's profitability.

For the sake of the analysis of the relation between family farm income, total output and stock of agricultural products, the linear regression analysis was used[10]. The data on the individual farms' types according to the direction of production and to the economic size in the EU were used. As a result, models for Poland and the all EU countries were estimated in the years 2004-2006 (for each year separately). They are presented in Table 5.

Taking into account Polish types of individual farms according to the direction of production and to the economic size, the determinant coefficient allows to notice that the variability of family farm income in the year 2004 was explained in 95% by value of crops output, livestock output and stock of agricultural products. In the year 2005 the variability of income was explained in 85% by value of livestock output and stock of agricultural products, and in the year 2006 this variability was explained in 63% by value of crops and livestock outputs. Meanwhile, while analysing types of individual farms according to the direction of production and to the economic size from the all EU countries, the determinant coefficient revealed that only 30% in the year 2004 and only 26% in the year 2005 of family farm income's variability was explained by values of crops output, livestock output and stock of agricultural products. In the year 2006 the model was not successfully established, because all variables appeared to be statistically insignificant[11].

The models established for Poland, despite some lacks, allow formulating some remarks. The influence of value of crops output and livestock output on the value of family farm income was similar in the analysed years. The growth of value of crops output by 1 euro was accompanied in the year 2004 by an increase of income by 0.22 euro, and in the year 2006 by 0.11 euro (with the established level of other variables). The enlargement of livestock output's value *caeteris paribus* by 1 euro brought about the growth of family farm income in the year 2004 by 0.17 euro, and in the year 2005 by 0.23 euro, and in the year 2006 by 0.19 euro. Differently, the enlargement of stock of agricultural products to the highest degree influenced the increase of income. So, in the year 2004 the increase of the stock's value *caeteris paribus* by 1 euro caused the growth of income's value by 0.70 euro, and in the year 2005 – the growth of income by 0.78 euro. It may serve as an indicator, that for Polish individual farms (according to the direction of production and to the economic size), taking the level of crops and livestock output as given, the additional costs related to stock of agricultural products did not have considerable importance and did not cause the reduction of income[12].

[10] Other regression (with raise to the power) was not used, because among analysed farms' types were presented types with negative family farm incomes.

[11] It is probably a consequence of a considerable data lack in the year 2006.

[12] This conclusion is probable, because in the Polish average individual farm balance sheet is show a relatively high level of agricultural products' stock in comparison with the average observed in the EU (Table 3).

Table 5. The models of family farm income for individual farms' types according to the direction of production and to the economic size in Poland and in the EU

Tabela 5. Modele dochodu z gospodarstwa rolnego dla typów indywidualnych gospodarstw rolnych według kierunku produkcji i wielkości ekonomicznej w Polsce i UE

Year Rok	Parameters of model Parametry modelu	R^2	n
Poland – Polska			
2004	$\hat{y} = 0.22x_1 + 0.17x_2 + 0.70x_3$ (7.98) (11.04) (5.81)	0.95	50
2005	$\hat{y} = 4970.91 + 0.23x_2 + 0.78x_3$ (8.59) (9.49)	0.85	50
2006	$\hat{y} = 11281.43 + 0.11x_1 + 0.19x_2$ (4.81) (5.38)	0.63	50
EU – UE			
2004[a)]	$\hat{y} = 17172.40 + 0.21x_1 + 0.09x_2 - 0.38x_3$ (12.97) (6.88) (–6.52)	0.30	615
2005	$\hat{y} = 19326.94 + 0.11x_1 + 0.11x_2 - 0.24x_3$ (8.67) (10.52) (–5.07)	0.26	615
2006[b)]	lack of model – all variables without statistical significance brak modelu – wszystkie zmienne nieistotne statystycznie	–	397

Explanations: $\hat{y}$ – family farm income (euro) – dependent variable, x_1 – value of total output crops and products (euro) – independent variable, x_2 – value of total output livestock and products (euro) – independent variable, x_3 – value of stock of agricultural products (euro) – independent variable, R^2 – determinant coefficient, n – number of production types according to the economic size, numbers in round brackets – values of t-Student statistics.

[a)]Without Malta.

[b)]Without 10 countries: Belgium, Denmark, Germany, Greece, Spain, Ireland, Latvia, The Netherlands, Slovenia and Great Britain.

Source: own calculations based on FADN [2008] data.

Objaśnienia: $\hat{y}$ – dochód z gospodarstwa rolnego (euro) – zmienna zależna, x_1 – wartość produkcji roślinnej (euro) – zmienna niezależna, x_2 – wartość produkcji zwierzęcej (euro) – zmienna niezależna, x_3 – wartość zapasów produktów rolniczych (euro) – zmienna niezależna, R^2 – współczynnik determinacji, n – liczba typów produkcyjnych według wielkości ekonomicznej, liczby w nawiasach – wartości statystyki t-Studenta.

[a)]Bez Malty.

[b)]Bez 10 krajów: Belgii, Danii, Niemiec, Grecji, Hiszpanii, Irlandii, Łotwy, Holandii, Słowenii i Wielkiej Brytanii.

Źródło: obliczenia własne na podstawie danych FADN [2008].

The different pattern was revealed, while analysing models estimated for all countries of the EU. On the basis of estimated parameters one can observe that the highest and positive influence on the growth of family farm income had a value of crops output. So, the enlargement of crops output's value *caeteris paribus* by 1 euro was accompanied in the year 2004 by an increase of income by 0.21 euro, and in the year 2005 by 0.11 euro. Taking into consideration a livestock production, the growth of its value by 1 euro in the year 2004 produced an increase of income by 0.09 euro, and in the year 2005 by 0.11 euro (taking other variables as given). The negative influence on the value of

family farm income had the growth of agricultural products' stock. Its change by 1 euro, *caeteris paribus* caused a decrease of income by 0.38 euro in the year 2004, and in the next year – by 0.24 euro. One can admit, that with given level of crops and livestock output, the additional costs related to stock of agricultural products caused income's reduction in the UE individual farms' types (according to the direction of production and to the economic size).

CONCLUSIONS

1. Comparing results obtained for farms from Poland and the EU it can be stated that in the years 2004-2006 an average Polish individual farm encompassed 50% of the area of agricultural land and achieved only ca 30% of the economic size than the medium observed in the EU. The analysis of balance sheets in this period revealed that in Polish average individual farm the balance sum increased by 8.5%, but still it remained only 25% of the average value observed in the EU.

2. In the years 2004-2006, the average total output of Polish individual farm was about 3 times lower than the one observed in the EU. The increase of the average family farm income was possible mainly due to the subsidies from the EU. At the same time, the dimension of family farm income and of family farm income without subsidies in farms from the EU countries occurred.

3. According to the linear regression models estimated for Poland, the positive influence of values of crops and livestock output on family farm income was revealed. The highest positive influence on the income's increase had the enlargement of stock of agricultural products. Models estimated for all the EU brought other results. The growth of the family farm income was growing mainly under the influence of a crops output, whereas negative influence on this variable had an increase of the stock of agricultural products.

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PRODUKCJA, DOCHODY I RELACJE MAJĄTKOWO-KAPITAŁOWE W GOSPODARSTWACH INDYWIDUALNYCH

Streszczenie. W pracy podjęto próbę przedstawienia produkcji, dochodów, składników majątku i źródeł jego finansowania w indywidualnych gospodarstwach rolnych w Polsce w porównaniu z innymi krajami należącymi do Unii Europejskiej. Szczególny nacisk położono na zbadanie relacji między dochodem, produkcją a zapasami w gospodarstwie. Badania zostały oparte na danych pochodzących z bazy FADN, obejmującej podstawowe przeciętne informacje o indywidualnych gospodarstwach rolnych za lata 2004-2006. Badania te wykazały, między innymi, że przeciętna produkcja i dochód z gospodarstwa rolnego były około trzykrotnie niższe w Polsce niż średnio w Unii, a ponadto wzrost dochodu możliwy był tylko dzięki dopłatom unijnym. Według modeli regresji, w Polsce pozytywny wpływ na powiększenie dochodu z gospodarstwa rolnego miały zapasy produktów rolniczych, produkcja roślinna i zwierzęca. Natomiast w Unii Europejskiej na wzrost dochodu oddziaływały pozytywnie produkcja roślinna i zwierzęca, a zapasy – negatywnie.

Słowa kluczowe: dochód, produkcja, bilans, zapasy

Accepted for print – Zaakceptowano do druku: 25.09.2008

For citation – Do cytowania: Ryś-Jurek R., 2009. The output, incomes and assets-capital relations in the individual farms. J. Agribus. Rural Dev. 1(11), 177-188.