Acta Sci. Pol.
Oeconomia 18 (2) 2019, 25–35
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2019.18.2.16

ORIGINAL PAPER

Received: 23.04.2019
Accepted: 27.06.2019

THE REDISTRIBUTION FUNCTION IN POLAND'S AGRICULTURAL BUDGETS IN THE LONG TERM

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ABSTRACT

The study specifies the premises and purposes of the redistribution function of budget expenditures on agriculture. It determines the amount of expenditures fulfilling these purposes in Poland's agricultural budgets in 1995–2018. An attempt was also made to assess their effects in the context of the dynamics of farmers' income, the disparity between farmers' income and the incomes of other social and professional groups, as well as intrasectoral disproportion in farm household income. It was demonstrated that the increase of budget expenditures on agriculture in 2004 contributed to a real increase of farmers' income and a decrease in the disparity between the income of farm households and the income of households in general and of working households. However, the increase of redistribution expenditures did not reverse the progressing process of farm household income polarisation.

Key words: agricultural budget, redistribution function, disposable income, farm
JEL codes: E62, H50, Q14, Q18

INTRODUCTION

Considerable amounts of funds are directed to the agricultural sector in Poland from the budget of the European Union (EU) within the framework of the Common Agricultural Policy (CAP) and from the national budget, with part of the funds from the national budget constituting an integral element of CAP instruments. These funds are part of public expenditures through which the state fulfils specific purposes with reference to the agricultural sector, and they are related to the functions of the fiscal policy, i.e. the allocation function, the redistribution function, and the stabilisation function [Buchanan and Musgrave 1999, Owsiak 2006]. Fulfilment of the purposes of the redistribution function is oriented at agricultural income.

The turnabout in the EU's agricultural policy in the 1980s and the 1990s towards increased financial support of agricultural income was related to the income disparity between agricultural producers and people employed outside the agricultural sector deepening in the process of industrialisation of the economy [Poczta-Wajda 2017]. This happened in spite of the increase in agricultural productivity and labour productivity in this sector. Within the last three decades, successive CAP reforms have reduced funds for market-price interventions in favour of support for rural areas and environmentally friendly functions of agriculture, yet farmers' income still remains the focus of the CAP.

The support received by agricultural producers in the EU is sometimes perceived as an example of political rent, and activities undertaken by well-organ-

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ised farmer interest groups – as a manifestation of rent-seeking [Tullock 1967, Kruger 1974]. Farmers' income in the EU is largely, sometimes even mostly, the result of political decisions and the financial support received [EC 2017]. The issue has been widely criticised. Some researchers argue that political rent is related to inefficient allocation of resources, distortion of market incentives, and unjustified benefits for selected social groups at the expense of others [Buchanan et al. 1980, Lee and Tollison 2011, Aligicia and Tarko 2014]. However, according to B. Czyżewski and Matuszczak [2016], the concept of political rent is not entirely adequate for the assessment of the agricultural policy. Subsidies constitute payment for public goods (activities for landscape, biodiversity, rural culture, tradition, etc.) or compensation for the imperfection of the market mechanism leading to the "drainage of economic rent from agriculture". Considering the above, only some of the subsidies, remaining after the amount compensating for market deficiencies and the payment for the public goods delivered is subtracted, meet the criteria of (pure) political rent.

Two facts should be mentioned among the reasons for budget support for agriculture:

1. On account of food production (i.e. quantitative and qualitative food security), "management" of the ecosystem by farmers with the current and future generations in mind, and the provision of social and cultural goods [Wilkin 2010, Zegar 2012, B. Czyżewski 2016], agriculture is too important a sector of the economy for contemporary developed society to be able to afford its marginalisation.
2. The profitability of agricultural activity is lower than that of non-agricultural activity due to the features of agricultural production (length of the production cycle resulting from biological characteristics, production dependent on climatic factors, etc.) and the features of land and labour resources involved in agriculture [cf. Czyżewski 2007]. This is evidenced by the so-called cash conversion cycle occurring in every type of business activity. It measures how many days are needed for the cash going through successive production stages and changing into other assets (materials, production in progress, ready product, amount due) to be converted back into cash again. In the case of non-agricultural manufacturing companies, such cycle usually takes 60 days [Mądra-Sawicka 2014], in the case of commercial companies – about 30 days, and in agriculture – a year on average (excluding the so-called special branches of agricultural production). A shorter cycle makes it possible to increase the number of working capital turnover cycles, which leads to an increase in the profitability of the given business activity. It is therefore impossible for income obtained from basic agricultural production to equal income from other sectors of production or services. Solutions for farmers include strong concentration and intensification of production, increasing its scale, and shortening – as far as possible biologically – the production cycle to the maximum extent (i.e. using solutions typical of industrial agriculture) or abandoning farming in favour of different economic activity. Both these solutions are disadvantageous to taxpayers and consumers. This is why they agree to transfer part of their income – through budget redistribution – towards farmers in order to decrease their income disparity and keep them in agricultural production. At the same time, subsidies for farmers involve the requirement to apply the cross-compliance mechanism.
3. The study specifies the purposes of the redistribution function of budget expenditures on agriculture and determines the volume of expenditures on the fulfilment of these purposes in Poland's agricultural budgets in the years 1995–2018. Moreover, an attempt was made at assessing the effects of these expenditures with reference to farmer household income. The relationship between budget expenditures on agriculture in Poland and the level of intersectoral disparity in farmers' income and inequalities in farm household income was analysed. In order to determine the interdependence between these two variables, linear correlation analysis and regression analysis was used. It was assumed that an increase in budget expenditures on agriculture, in particular of redistribution expenditures, should lead to a decrease in the disparity in farmers' income and a reduction of the income gap in the sector.
4. The relatively long temporal scope of the research, including the years 1995–2018, made it possible

to analyse the level of redistribution expenditures from the agricultural budget and their effects in the pre-accession period (1995–2003) and after Poland joined the EU (2004–2018). On account of the availability of data on income, the analysis of the interdependence between budget expenditures and agricultural income covers the years 1995–2017. The research included the following income categories: (i) average real per capita disposable income within a farmers' household; (ii) gross real disposable income in individual farms in agriculture; (iii) real disposable income obtained from a farm. The first two categories of income were compared to the income of households in general and of working households. Consumer price index (CPI) was used as a deflator in order to make the income and budget expenditures realistic.

5. The source of empirical materials on budget expenditures on agriculture in the years 1995–2018 was the Ministry of Agriculture and Rural Development. Data on income was obtained from the periodic survey carried out by the Statistics Poland (GUS) entitled *Household budgets* (monthly per capita disposable income) and *Statistical Yearbook of Agriculture* (gross disposable income) for the years 1995–2017 [GUS 1995–2017a, b].

RESEARCH RESULTS AND DISCUSSION

With respect to the previously mentioned reasons, we may distinguish two redistribution purposes of budget expenditures on agriculture [Kulawik 2009, Juszczyk et al. 2016]:

- an increase in the income of farmers' households, thus reducing the disparity in farmers' income compared to other social and professional groups;
- a decrease in the income gap between farms.

By agricultural budget expenditures we mean national public funds and EU funds directed to agriculture (also directly to agricultural producers) and expenditures on rural development, agricultural markets, and support for the Agricultural Social Insurance Fund (ASIF).

It is not easy to attribute budged expenditures to a specific fiscal function, as they often affect different social and economic processes at the same time. The fundamental purpose of the redistribution function is to support farmers' income. Some expenditures, e.g. direct subsidies, increase farmers' income directly, whereas others impact it through a reduction of the costs of agricultural production (e.g. subsidies for insurance). Other expenditures contribute to the stabilisation of agricultural income (expenditures on agricultural markets, on countering the effects of natural disasters) or support farm development processes, creation of alternative sources of income, and rural development. These expenditures, though with some delay, may also increase farmers' income through the effects of investments.

Considering the above, we applied two types of approach in our research:

- we treat all the expenditures from the agricultural budget as funds directly or indirectly affecting agricultural income;
- we isolate the expenditures whose fundamental purpose is to support agricultural income within a short time (we will call these redistribution expenditures).

Among the expenditures on agriculture from the national budget, the subsidy to ASIF constitutes the largest amount. In the pre-accession period (1995–2003), the average amount of the subsidy was PLN 12.3 billion – it increased consistently from PLN 6.2 billion to nearly PLN 16 billion. This kind of increase of the subsidy to ASIF became necessary in view of the long-term, deepening income inefficiency of farms. In the years 2004–2018, the annual average budget support for ASIF amounted to PLN 16.3 billion (ranging from PLN 14.5 billion to 18.2 billion). In the years 1995–2003, the subsidy to ASIF constituted 73.5% of Poland's agricultural budget on average, whereas in the post-accession period (2004–2018), as a result of covering agriculture and rural areas with support from CAP instruments, the share in the total agricultural budget (including EU funds) decreased to an average of 37%. The lowest share was recorded in the years 2011–2015 (31.6% on average).

The degree of self-funding of the system of social insurance of farmers in Poland is 21–26%, which means that the state subsidises this insurance to the extent of 74–79% [Podstawka 2016]. The situation is similar in other EU countries (including Germany and

France), but the share of subsidies to this system in Poland is higher by several percentage points [Czyżewski 2016]. A substantial part of the subsidies to ASIF are subsidies to contributions, thanks to which these contributions can be considerably lower than if they were to fully cover the needs of the system. Moreover, part of the subsidies are subsidies to retirement benefits. In the authors' opinion, both these parts fulfil the purposes of the redistribution function. It is worth mentioning that in the period of transformation of the Polish economy (in the 1990s), the benefits paid out by ASIF provided subsistence to many farmer families. Also later, these benefits constituted a substantial percentage of income in an average farm household. In 2005, in 27.1% of farmer households, pension and retirement benefits constitutes more than 50% of the total family income. In 2016, there were considerably fewer such farm households, i.e. 13.6%, with 1/3 of farm households obtaining income from pension and retirement benefits [GUS 2006, 2017]. In 2005, income from pension and retirement benefits constituted 13.7% in the structure of disposable income of farm households. In the subsequent years, this share consistently decreased, reaching the level of 11.8% in the years 2010–2017. However, it is still a significant item in the structure of farm family income.

A turning point for the change both in the general level of budget expenditures on agriculture and the structure of these expenditures was Poland's accession to the EU in 2004 and the implementation of CAP instruments. Already in 2004, agricultural budget expenditures were nominally almost three times higher than in 1995 and in real terms, they were higher by nearly 30% (Table 1). In the subsequent years, primarily due to EU funds, but also the national contribution to the CAP, the agricultural budget kept

Table 1. Expenditures from Poland's agricultural budget (national and EU funds) in 1995–2018

Year	National agricultural budget		EU funds[a]	Total (national and EU funds)	Dynamics, year 2004 = 100		Agricultural budget State budget (%)
	agriculture, rural areas, agricultural markets	ASIF			nominal	real (2016 prices)	
1995	2 404.5	6 269.1	–	8 673.6	34.4	70.2	9.51
1997	3 042.5	9 826.2	–	12 868.7	51.0	75.5	10.07
1999	3 126.7	13 750.3	–	16 877.0	66.9	82.6	11.88
2001	5 552.7	15 836.8	1 131.1	22 520.6	89.3	94.9	12.36
2003	5 937.3	15 617.9	1 508.4	23 063.6	91.4	94.6	11.92
2004	7 673.1	15 607.6	1 951.7	25 232.4	100.0	100.0	14.45
2006	8 379.1	14 968.8	10 927.4	34 275.4	135.8	131.7	15.31
2008	19 616.9	15 771.4	14 928.3	50 316.5	199.4	181.1	16.21
2010	12 901.4	16 187.8	15 993.4	45 082.7	178.7	152.8	14.97
2012	11 571.6	15 856.3	21 265.4	48 693.3	193.0	152.6	14.81
2014	10 818.2	16 698.6	26 150.0	53 666.9	212.7	166.6	16.53
2016	8 402.1	18 238.9	26 653.2	53 294.1	211.2	168.0	14.46
2018	9 310.4	17 936.4	21 492.2	48 739.0	193.2	156.1	12.27

Since 2010, formal EU funds have been excluded from the national budget and included in the European Funds Budget (EFB). In the table, EU funds, also for the earlier period (2000–2009), were isolated from the national budget.

Source: Ministry of Agriculture and Rural Development data based on the implementation of budget acts from the years 1995––2018.

growing very rapidly and in 2009, it was nominally almost 6 times higher compared to 1995 (by 161.3% in real terms). In the period that followed, certain degree of stabilisation of the agricultural budget at the level of PLN 53–55 billion could be observed, with some one-year decreases to the level slightly above PLN 48 billion (in 2012 and in 2017–2018). In general, in the post-accession period, the total agricultural budget (national and EU funds) was higher on average by 176% nominally and by 88.4% in real terms compared to the average level from the pre-accession period.

When it comes to redistribution expenditures from the national budget, apart from a considerable fixed amount of subsidies to ASIF, the remaining instruments were more or less permanent in nature (Table 2). Subsidies for agricultural fuel (reimbursement of excise tax on fuel) – which have been in effect since 2006 and in the years 2006–2018 amounted to PLN 716 million on average – constituted quite a significant element among these instruments. Another rather important, though changeable element among budget expenditures are subsidies for crop and farm animal insurance, also in effect since 2006. Subsidies for qualified

Table 2. Expenditures from the agricultural budget fulfilling redistribution purposes in 1995–2018

Detailed division	Expenditures in the years	Expenditures per annum (bracket; average)
National budget (apart from contribution to CAP)		
Subsidy to ASIF	1995–2018	PLN 6.3–18.2 billion; avg. PLN 14.8 billion
Subsidies for agricultural fuel	2006–2018	PLN 650–895 million; avg. PLN 716 million
Subsidies for qualified seed material	2007–2017	PLN 19.4–119.8 million; avg. PLN 84.5 million
Subsidies for crop and farm animal insurance[a]	2006–2018	PLN 80–802 million; avg. PLN 261 million
Subsidies for calcium fertilisers	1996–2004	PLN 20–201 million; avg. PLN 80 million
Subsidies for "Extra" class milk	1995–2003	avg. PLN 69.2 million
Expenditures within the framework of the CAP, financed from EU funds and the national budget (contribution)		
Direct subsidies	2004–2018	PLN 6.3–14.8 billion; avg. PLN 11.8 billion
Support for less favoured areas (LFA)	2004–2018	PLN 1 145–1 361 million; avg. PLN 1 325 million
Agri-environmental payments[b]	2004–2018	PLN 170–1 535 million; avg. PLN 795 million
Afforestation of agricultural land, improvement of forest viability	2004–2018	avg. PLN 120 million
Support for semi-subsistence farms (RDP 2004–2006)	2004–2010	avg. PLN 304.3 million
Other: quality systems, advisory services	2007–2018	avg. PLN 15.5 million
Redistribution expenditures/CAP expenditures in total	2004–2018	66.5%
Redistribution expenditures in the national budget in total[c]	1995–2018	67.7% [6.7% excluding ASIF]
including:		
– in the pre-accession period	1995–2003	77.0% [5.0% excluding ASIF]
– in the post-accession period	2004–2018	61.7% [7.7% excluding ASIF]

[a]Excluding the amounts paid out in the case of crop damage due to draught, flooding, etc.
[b]Including climate payments and eco-friendly farming in the RDP 2014–2020.
[c] Without including the national contribution to CAP instruments.

Source: Own calculations based on Ministry of Agriculture and Rural Development data and Agency for Restructuring and Modernisation of Agriculture statistics.

seed material functioned in the agricultural budget for a relatively long time (2007–2017), and in the pre-accession period, subsidies for calcium fertilisers and "Extra" class milk were also available.

In the pre-accession period (1995–2003), redistribution expenditures ranged from PLN 6.4 billion to 16.2 billion nominally, with the majority constituting subsidies to ASIF (Fig. 1). Their share in the agricultural budget was 75.2% on average, ranging from 68.6% to 81.9%. If we exclude subsidies to ASIF, the remaining redistribution expenditures constituted only 0.4–2.2% of the agricultural budget (Fig. 2) – with the average amount PLN 179 million.

Since 2004, mainly due to EU funds, a clear "rebound" has been recorded in the form of permanent real increase in redistribution expenditures (Table 1, Fig. 1). In 2004, their share in the total agricultural budget reached a record level of 93.5% (Fig. 2). This resulted from the fact that the introduction of CAP instruments oriented at agricultural development (e.g. activities sup-

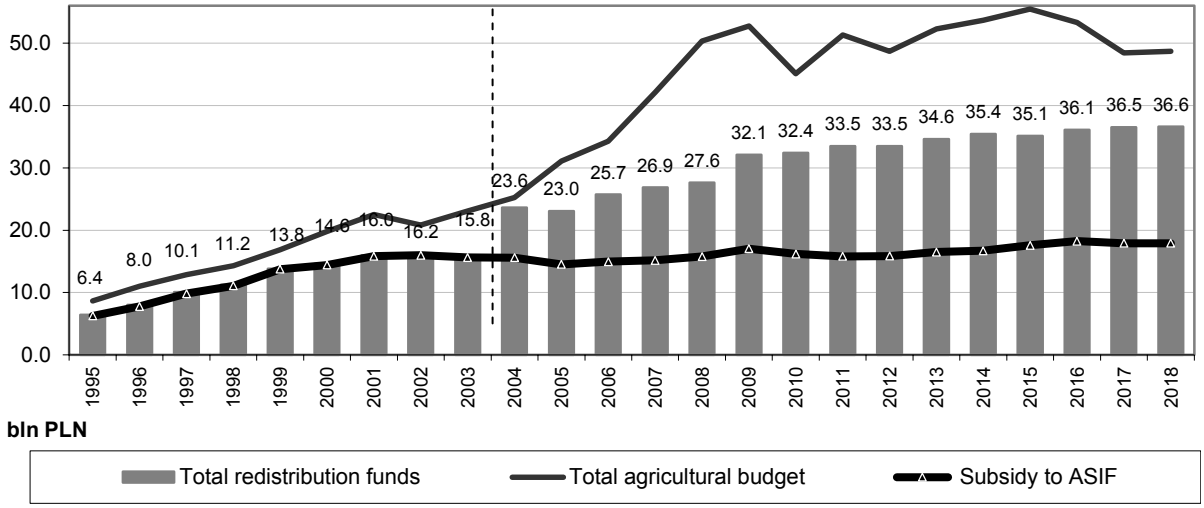

Fig. 1. Redistribution expenditures in the light of the total agricultural budget in 1995–2018

Source: Own calculations based on Ministry of Agriculture and Rural Development and Agency for Restructuring and Modernisation of Agriculture data.

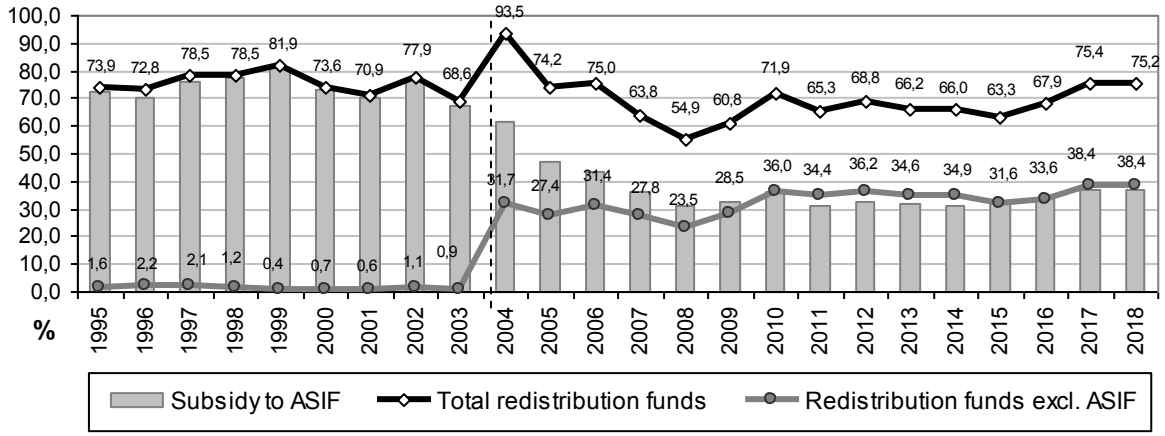

Fig. 2. Share of redistribution expenditures in the total agricultural budget in 1995–2018

Source: Own calculations based on Ministry of Agriculture and Rural Development and Agency for Restructuring and Modernisation of Agriculture data.

porting investments) was delayed relative to the moment in which the funds directly supporting agricultural income were made available. In 2004, strictly national expenditures, almost entirely dedicated to the redistribution function (subsidies to ASIF) accumulated with CAP expenditures which supported farmers' income. In the subsequent years after accession, we can see, however, that the considerable nominal increase in redistribution expenditures (Fig. 1) was accompanied by a decrease in their share in Poland's agricultural budget to the level of just under 55% in 2008 (Fig. 2). Apart from social and income-related purposes, budget transfers to agriculture increasingly supported the purposes of the allocation and stabilisation functions in agriculture. In the years 2009–2018, the share of redistribution expenditures in the total agricultural budget ranged from 60.8% to 75.4% (Fig. 2). After Polish agriculture was covered by CAP instruments, the volume of total redistribution expenditures increased to an average level of PLN 31 billion per annum (ranging between PLN 23.1 billion and 36.6 billion). This means that in the post-accession period, these expenditures constituted 2.5 times the average from the years 1995–2003 and were higher by 72% in real terms. The scale of the increase of redistribution expenditures is reflected by a different value. If we take into consideration redistribution expenditures excluding subsidies to ASIF, the annual average amount of this type of expenditures in the post-accession period was 52 times higher in real terms than the average amount of this type of expenditures in the years 1995–2003. Thanks to the CAP, in 2004, the agricultural sector gained funds directly supporting farm household income. This kind of support was basically non-existent in the pre-accession period (Table 2).

It should be emphasised that the set of CAP instruments includes certain mechanisms of intrasectoral redistribution. When it comes to the financial perspective 2014–2020, the so-called redistribution (additional) payment, available in Poland since 2015, to which farms with the surface area ranging from 3.01 ha to 30 ha of AL are entitled, should be mentioned here. A limit for subsidies per farm up to the amount of EUR 150,000 applies.

In order to determine the direction and strength of the connections between agricultural budget expenditures and farmer household income, statistical analysis was used. At first, the values of the Pearson (linear) correlation coefficient between three variables X_i illustrating budget expenditures on agriculture (Table 3) and two variables Y_{1-2} describing the income of farmer households and income obtained from a farm

Table 3. Pearson (linear) correlation coefficients between budget expenditures on agriculture (X_i) in billion PLN (as fixed prices) and the variables describing agricultural income (Y_i)

Detailed division	X_1 total agricultural budget	Redistribution expenditures	
		X_2 in total	X_3 excl. ASIF
Y_1 – real per capita disposable income in farmer households (PLN)	0.7672*	0.7742*	0.8298*
Y_2 – real gross disposable farm income in the individual farm sector (billion PLN)	0.7579*	0.7759*	0.8609*
Y_3 – income gap between the per capita disposable income of farmers and employed persons (%)[a]	–0.3773	–0.3943	–0.4623*
Y_4 – indicator WP_{LD} with reference to households in general	0.4886*	0.5312*	0.5626*
Y_5 – indicator WP_{LD} with reference to working households	0.4817*	0.5512*	0.5656*
Y_6 – diversity of per capita disposable income in farmer households – Gini coefficient	0.8942*	0.8591*	0.8507*

*Correlation coefficients are significant when $p < 0.05$; $N = 23$ (years 1995–2017).
[a]Statistical significance of the correlation for variable X_{3t-1}, i.e. for expenditures from the preceding year.
Source: Own calculations based on Statistics Poland data.

(Table 3). All the categories of income and expenditures were considered based on fixed prices. Moreover, the correlation between the X_i characteristics and the variable describing the income gap between farmers and employed persons (Y_3) with respect to per capita disposable income was examined. With reference to gross disposable income, in turn, the value of the authors' original indicator of progress in reducing the income gap (WP_{LD}) between the income of farmer households and the income of households in general (Y_4), as well as the income of employed persons (Y_5) was calculated.

The last dependent variable is the Gini coefficient describing the diversity of farm households in terms of per capita disposable income (Y_6). The indicator of progress in reducing the income gap (for year t) was expressed using the following formula:

$$WP_{LDt} = \frac{D_{Rt}}{D_{Rt-1}} : \frac{D_{Nt}}{D_{Nt-1}}$$

where:

D_{Rt}/D_{Rt-1} – change (year/year) in the gross disposable income of farmers;

D_{Nt}/D_{Nt-1} – change (year/year) in the gross disposable income in the reference population.

If the value of the progress indicator (WP_{LD}) in the given year was [0 > 1], it means that the income gap between individual farmer households and households in general (or working households) increased, and if the value was higher than 1, it means that the income gap decreased.

The correlation of variables X_i with the disposable income of farmer households (Y_1) and the disposable farm income (Y_2) is positive and high, and the highest correlation indicators were recorded for redistribution expenditures excluding subsidies to ASIF (X_3). Positive correlation indicators of moderate strength also apply to the relationship between the variables describing budget expenditures and the indicators of progress in reducing the income gap of farmers (Y_4 and Y_5). The correlation with the Gini coefficient (Y_6) describing the diversity of income in farmer households is also positive and demonstrates a rather high value (Table 3). For the variable describing the income gap of farmers compared to employed persons (Y_3), statistically significant negative correlation was determined with reference to variable X_3, but with the use of a one-year delay in redistribution expenditures. In order to determine the cause-and-effect relationships between the analysed variables, the regression function was used. It order to estimate it, variable X_3 (redistribution expenditures excluding ASIF) was selected due to the fact that this characteristic demonstrated the strongest correlation with the dependent variables. Moreover, this characteristic best represents the income-oriented purposes of the agricultural budget.

Based on the augmented Dickey–Fuller (ADF) stationarity test, it was established that all the analysed characteristics are non-stationary ($p > 0.1$), which was taken into consideration in the estimation of the regression function, i.e. it was examined in what way the increases of variable X_3 (redistribution expenditures) influence the change (increases) of dependent variable Y_i. Estimations were carried out in two variants for variable X_3, i.e.: X_{3t} – i.e. redistribution expenditures considered for the same year as the values of variable Y_i; X_{3t-1} – expenditures for the year preceding the year for which the values of variable Y_i were determined.

Thus the estimations of the regression function using the method of least squares have the following forms:

$$\Delta Y_{i,t} = ao + a_1 \Delta X_{3t} + \varepsilon \quad (1)$$

$$\Delta Y_{i,t} = ao + a_1 \Delta X_{3t-1} + \varepsilon \quad (2)$$

Regression analysis (Table 4) confirmed the positive relationship between the redistribution expenditures on agriculture and the disposable income of farm households (Y_1), as well as farmers' disposable income obtained from a farm (Y_2). The demonstrated relationships occur with the values of the characteristics determined for the same year, which means that an increase in redistribution expenditures translates directly into an increase in agricultural income. The fit of the regression function to the variables representing the income level is not high, which is not surprising considering the fact that agricultural income is determined by a number of endogenous and exogenous characteristics for farms. A statistically significant

Table 4. Parameters of the regression function describing the influence of redistribution expenditures excluding ASIF (X_3) on farmers' income in absolute and relative terms and on the diversity of that income

Parameter	Y_1 per capita disposable income	Y_2 income from a farm	Y_3 income gap	Y_4	Y_5	Y_6 Gini coefficient for farmers' income
				WP_{LD} in relation to households:		
				in general	working	
	Function no					
	1	1	2	1	1	1
ao	5.969 (26.78)	0.127 (0.529)	0.466 (1.761)	−0.001 (0.016)	–0.0024 (0.015)	0.004 (0.004)
a_1	0.015* (0.007)	0.00045** (0.0001)	–0.0012** (0.0003)	0.000006* (0.00002)	0.000009** (0.000002)	0.000001 (0.00002)
R^2	0.053	0.156	0.089	0.023	0.054	0.003
F (p)	0.046	0.00001	0.0009	0.014	0.0006	0.728
White (p)	0.541	0.413	0.761	0.732	0.755	0.143
Normality (p)	0.784	0.504	0.296	0.001	0.016	0.09
*LM*1	0.107	0.802	0.481	0.653	0.516	0.579

Statistical significance: **$p < 0.001$; *$p < 0.05$; resistant standard errors were provided in brackets.

Testing for normality of the distribution of residuals – Doornik–Hansen test; Autocorrelation (*LM*1) – Breusch–Godfrey test.

Source: Own calculations based on Statistics Poland data.

cause-and-effect relationship between redistribution expenditures on agriculture and variable Y_3 was established, but it needs to be noted that the regression model is correct for variable X_{3t-1}, i.e. with a one-year delay. Coefficient a_1 is negative, which indicates that the higher the redistribution expenditures on agriculture, the smaller the income gap between the disposable income of farmers and employed persons. Better parameters of this function for expenditures considered with a one-year delay may indicate that budget expenditures not only increase farmers' income in the given financial year, but also have a certain ability to create agricultural income in the subsequent year. The regression function for variable Y_6 (intrasectoral diversity of income) is not statistically significant, whereas in the case of variables Y_4 and Y_5, the estimated regression functions (for X_{3t}) are statistically significant, but the residuals are not normally distributed, so the functions do not meet the criterion of correctness. Positive values of the statistically significant correlation coefficients and the estimations of the regression function for these variables allow us to carefully conclude that growing redistribution expenditures have a beneficial impact on the reduction of intersectoral income gap of farmers.

CONCLUSIONS

The stream of budget expenditures available to agriculture since 2004 caused a considerable increase in agricultural income compared to the previous years. It is noteworthy that in the years 2004–2009, real redistribution expenditures on agriculture grew more rapidly (on average by 10.5% year on year) than farm income (4.4% y/y). In the years 2010–2017 on the other hand, a reverse situation could be observed, i.e. the annual average real growth rate of expenditures was 1.1%, while the real disposable income of farmers grew by 6.8% on average. It is more clearly visible since 2010 that redistribution expenditures not only directly contributed to the increase in agricultural income, but also affected efficiency-oriented processes

in agriculture, which resulted in further acceleration of agricultural income growth.

The increase of budget expenditures on agriculture as a result of the sector coming under CAP instruments contributed to the decrease in the disparity in the income of farmers compared to other professional groups. In spite of successive reduction in the post-accession period, the income gap of farmers still exists, which constitutes an argument in favour of maintaining redistribution expenditures in the set of instruments of the agricultural policy.

The increase of redistribution expenditures on the agricultural sector after 2004 was accompanied by deepening intrasectoral disproportion in income. However, a cause-and-effect relationship between the Gini coefficient in terms of farmers' disposable income inequalities and the redistribution expenditures on agriculture could not be proved. Moreover, FADN data, as well as research carried out by other authors [Juszczyk et al. 2016] shows that the diversity of family farm income is much greater for income reduced by budget subsidies than for total income. This brings us to a careful conclusion that budget expenditures directed to agriculture are not able to reverse the tendency for farm income polarisation, but moderate that polarisation, which is advantageous to the sustainable development of agriculture.

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FUNKCJA REDYSTRYBUCYJNA W BUDŻETACH ROLNYCH POLSKI W DŁUGIM OKRESIE

STRESZCZENIE

W opracowaniu określono przesłanki i cele funkcji redystrybucyjnej wydatków budżetowych na rolnictwo oraz ustalono wielkość wydatków, dzięki którym można było zrealizować te cele w budżetach rolnych Polski w latach 1995–2018. Podjęto także próbę oceny ich efektów w kontekście dynamiki dochodów rolników, dysparytetu dochodów rolników względem innych grup społeczno-zawodowych, a także wewnątrzsektorowych dysproporcji dochodowych gospodarstw rolniczych. Wykazano, że zwiększenie wydatków budżetowych na rolnictwo od 2004 roku przyczyniło się do realnego wzrostu dochodów rolników oraz zmniejszenia dysparytetu dochodowego gospodarstw rolniczych względem gospodarstw domowych ogółem i pracowniczych. Wzrost wydatków redystrybucyjnych nie odwrócił jednakże postępującego procesu polaryzacji dochodowej gospodarstw rolniczych.

Słowa kluczowe: budżet rolny, funkcja redystrybucyjna, dochód rozporządzalny, gospodarstwo rolne