p-ISSN 0044-1600
e-ISSN 2392-3458

Zagadnienia Ekonomiki Rolnej
Problems of Agricultural Economics

www.zer.waw.pl

4(357) 2018, 3-19

DOI: 10.30858/zer/100699

Articles

EFFICIENCY OF POLISH AGRICULTURE BETWEEN 1998 AND 2015

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Abstract

In several years leading up to and in the year of the accession, Polish agriculture has seen a rapid growth in the agricultural production efficiency, followed by its slow decline. The article identifies the reasons for this phenomenon. In the first of these subperiods, there was considerable economic freedom and an increase in support for farms, granted mainly by the domestic funds. In the years after 2004, the situation changed. The amounts of aid funds increased, so did the environmental and consumer health and animal welfare requirements to be met by farmers being beneficiaries of subsidies. In addition, larger farms also reduced their economic activity due to the degression in subsidy rates. It is also probable that some agricultural producers have been mainly focused on using subsidies and this phenomenon was accompanied by a decrease in interest in improving the agricultural production efficiency. Some arguments contained in the article were based on estimates. They are rationally substantiated, but according to the author, the article should be considered as preliminary analysis of the topic.

Keywords: efficiency, agriculture, production efficiency.

JEL codes: Q11, Q21, Q28.

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Introduction

The preliminary findings showed that Polish agriculture, in a period of several years prior to, in the year of and some years after accession, has been subjected to processes atypical of a country with intermediate level of economic development.

Table 1

Resources of utilised agricultural area, labour inputs and production costs in constant prices per PLN 1 million of the value of revenues in Polish agriculture[a] in 2000-2015

Types of resources, inputs and costs	Years			
	2000	2005	2010	2015
Utilised agricultural area (ha)	222.4	191.1	175.7	159.0
Employment per FTE	32.3	27.5	22.6	21.2
Costs of intermediate consumption[b] (PLN thousand)	735.5	653.8	686.3	744.5
Year 2000 = 100,0				
Utilised agricultural area	100.0	85.9	79.0	71.4
Employment per FTE	100.0	85.1	70.0	65.6
Costs of intermediate consumption[b]	100.0	88.9	93.3	101.2

[a] Revenues have also been calculated in constant prices.
[b] Calculated together with depreciation costs of fixed assets.

Source: own findings made based on the data taken from: GUS (2017a); Eurostat (access date: 17.10.2017); GUS (2017b) and *Rachunki*... (RER) as of 9.12.2016.

The loss in the utilised agricultural area and in the number of the employed per unit of production volume was not accompanied by an increase, but rather, by a decrease in production costs of intermediate consumption (Table 1). An important reason for this phenomenon could be the increased agricultural production efficiency.

The objective of this paper is to present the size of the above-mentioned phenomenon and to identify its reasons as well as the reasons for its disappearance in the second part of the analysed period.

Method of analysis

The agricultural efficiency was measured by a ratio of the value of income to the costs of intermediate consumption. On the side of revenues, the following were included: the value of agricultural production, receipts from agricultural production services provided to other farms and the value of homemade products prepared using own agricultural products. On the other hand, the intermediate consumption included the costs of: seeds, seed potatoes and own and purchased seedlings; energy carriers and lubricants; mineral fertilisers and soil improvers, plant protection products, agricultural services, own and purchased feedstuffs, medicinal products for animals, veterinary services; repair and maintenance of machinery and buildings, as well as the depreciation of fixed assets.

The data was sourced from the economic accounts for agriculture (EAA), which are satellite accounts with respect to some national accounts. Since 1998,

the Institute of Agricultural and Food Economics – National Research Institute has kept them in cooperation with the Central Statistical Office (*Główny Urząd Statystyczny*, GUS) for the needs of the European Commission. These accounts covered the period between 1998 and 2015. The EAA set of figures covering this period, as of 9 December 2016, has provided nominal amounts of the value of agricultural revenues and costs of intermediate consumption.

The nominal amounts of revenues and costs of intermediate consumption taken from the EAA were converted into constant prices. For this purpose, the authors used GUS materials collected since 1995. What was determined on the basis of those materials, were fixed base indices of changes in selling prices of agricultural products and in prices of means of production purchased by agricultural producers in between 1998 and 2015, assuming that the prices of 2015 are equal to "1". Thus established figures are contained in Tables 1 and 2 of the Annex.

The amounts of income and costs of intermediate consumption in subsequent years, as calculated in constant prices of 2015, were then converted into average five-year amounts, so as to make it easier to establish their trend changes. The amounts of both indicators, calculated in this way, become the basis for the calculations describing the calculations of changes in the agricultural efficiency ratio in the analysed period.

Results of the findings and determining the reasons for changes

Table 2 presents the figures determining the components of the agricultural efficiency ratio between 1998 and 2015.

Table 2

Average five-year amounts of revenues and costs of intermediate consumption of Polish agriculture, determined in constant prices (of 2015) and dynamics of their change

Average five-year amounts	Mid-years of five-year periods	Revenues		Costs of intermediate consumption	
		PLN billion	Previous period=100	PLN billion	Previous period=100
1998-2002	2000	80.5	-	65.7	-
1999-2003	2001	80.5	100.0	63.7	96.9
2000-2004	2002	82.1	102.0	63.4	99.5
2001-2005	2003	83.5	101.7	62.5	98.6
2002-2006	2004	84.2	100.8	62.2	99.5
2003-2007	2005	86.1	102.2	63.6	102.2
2004-2008	2006	86.5	100.5	64.5	101.4
2005-2009	2007	86.5	100.0	64.2	99.5
2006-2010	2008	86.8	100.3	64.6	100.6
2007-2011	2009	87.5	100.8	65.6	101.5
2008-2012	2010	86.9	99.3	64.9	98.9
2009-2013	2011	87.8	101.0	64.9	100.0
2010-2014	2012	88.6	100.9	64.9	100.0
2011-2015	2013	89.4	100.9	66.6	102.6

Source: own findings made based on the results of economic accounts for agriculture (EAA) as of 9.12.2016 and materials taken from GUS studies.

In the analysed period, the value of income increased by 11.1%. This increase took place in ten five-year periods analysed, in two – there was a stagnation and in only one – a decline. But then, the costs of intermediate consumption declined until 2004. However, in the subsequent years, they increased to such a level that the overall increase in the amount of the costs over the entire analysed period was 1.4%. However, the figures in Table 3 point to changes in the national agricultural efficiency ratios in the individual years of the analysed period.

Table 3

Average five-year sizes of the national agricultural efficiency ratios in 1998-2015

Average five-year amounts	Mid-years of five-year periods	Ratio size[a]	Previous period=100
1998-2002	2000	122.5	-
1999-2003	2001	126.4	103.2
2000-2004	2002	129.4	102.4
2001-2005	2003	133.6	103.2
2002-2006	2004	135.6	101.5
2003-2007	2005	135.4	99.8
2004-2008	2006	134.1	99.0
2005-2009	2007	134.7	100.4
2006-2010	2008	134.4	99.8
2007-2011	2009	133.4	99.2
2008-2012	2010	133.9	100.4
2009-2013	2011	135.3	101.0
2010-2014	2012	136.5	100.9
2011-2015	2013	134.2	98.3

[a] Amounts of revenues in PLN per PLN 100 of the costs of intermediate consumption.

Source: own calculations prepared based on the figures in Table 3.

The average of the size of the national agricultural efficiency ratio in the last analysed five-year period was by 10.7% higher than the first five-year period, but the increase was not even. In the first five periods, the value of the ratio was growing continuously from 122.5 to 135.6. Thus, the increase amounted to 13.1 percentage points (pp) and its annual average rate was 2.5%. In the next nine five-year periods, the value of the ratio varied between 133.4 and 136.5. A comparison of the average three-year values from the beginning and the end of this period indicates a weakly outlined downward trend in the value of the analysed ratio. Back then, the value of the ratio decreased by 1.2, which means that the average annual rate of this decrease was 0.1%.

An upward trend in the value of the agricultural efficiency ratio in the years prior to and in the year of accession was probably initiated in 1994, before farms gained

access to low-cost loans financed from the national budget. In the years preceding the accession, also the funds from the SAPARD and PHARE programmes, co-financed by the European Union, became available[1], but their direct impact should not be oveestimated.

Moreover, because of a collapse of the state-owned farms and some agricultural production cooperatives and also due to generation change, 1.4 million ha of UAA between 1996 and 2002 changed their owners. Therefore, 2.8 thousand large agricultural enterprises could appear and the share of farms held by natural persons with an area of 15-50 ha of UAA could increase by about 25% (Józwiak, 2014).

From the panel of 5,387 farms which between 2005 and 2007 kept accounts for the Polish FADN, the author selected those with profit[2] and presented their characteristics against a background of other farms. The results of the account are included in Table 4. The farms with profit had the value of assets about twice higher than those without profit, but what is important is that their production efficiency ratio was by 18.7% higher.

Table 4

Characteristics of the panel of natural persons' farms with profit[a] against a background of the farms without profit (average figures from 2005-2007)

Ratios	Farms	
	with profits	others
Number of analysed farms	1,716	3,671
Value of assets (property), including land, in PLN thousand	940	465
Average size of the efficiency index of analysed farms	142.7	120.2

[a] Profit was calculated as a difference of agricultural income and contractually calculated payment for own labour. For details please refer to footnote 2, below.

Source: own findings prepared based on the study by Józwiak (2014).

Based on agricultural accounting data of 1999, figures from the national agricultural census of 1996 and similar figures for 2005-2007, it was estimated that the national number of farms with profit, together with those without profit but with the extended reproduction of assets (property), and therefore the total number of farms not drifting but economically active increased in 1996-2006 by 68 thousand, i.e. by 64.1% (Table 5). In the same period, the number of other natural persons' farms decreased by 366 thousand, i.e. by 20.1%. The latter group included the farms selling the whole or the majority of their final production and those producing mainly or exclusively for the needs of the holders' families. Since none of them gained any

[1] Special Accession Programme for Agriculture and Rural Development and Poland and Hungarian Assistance for Restructuring of their Economics.

[2] Profit was calculated as a difference of agricultural income and contractually calculated payment for own labour. Payment for labour of one person employed full-time on their own farm was calculated at a parity rate (payment for managerial labour, labour devoted to marketing and executive labour), and the remaining labour input was valued according to market payment for hired labour in agriculture.

profit, their equity was not covered. This was the reason why on the farms called "others" a permanent depreciation of assets and, what is more, family work unit payment were lower than the parity rate and average market payment for hired labour in agriculture. In this situation, some successors did not want to take over such farm from its previous user.

Table 5

Estimated change in the number of farms in Poland with agricultural production and the area of more than 1 ha of UAA differing in terms of their economic activity in 1996-2007 (in thousands)

Type of farms	Years	
	1999[a]	2005-2007[b]
With and without profit but with positive reproduction of assets	106	174
Other	1807	1444

[a] Figures estimated based on the agricultural accounting data of 1999 figures (IERiGŻ, 2000) from the national agricultural census of 1996 (GUS, 1997).

[b] Averages for 2005-2007 estimated based on data taken from the study of Józwiak (2014) and figures from the national agricultural census of 2002 (GUS, 2003).

Source: own findings.

Another important factor that led to a rapid increase in the agricultural efficiency index in several years prior to accession and in the year of accession, was a significant reduction in the area of UAA. The farms quit cultivating marginal UAA, for example with poor soils, and some UAA was allocated for other purposes. The total loss in UAA in 2002-2010 amounted to 1,396 million ha (GUS, 2012c), i.e. 8.3%. This phenomenon has only been inhibited in the following years. There are no figures demonstrating the impact of this loss on the value of the analysed index, so the author refers to an estimate. The paper assumes that crops cultivated on the worst quality land were those whose efficiency ratio was as in the case of winter rye. Since the average value of this ratio in 2009-2010 was 107.2 (Augustyńska-Grzymek, Cholewa and Żekało, 2011), it was possible to determine that the average country-wide ratio increased due to the fact that between 2002 and 2010 there was a reduction in the national area of UAA, from 129.4[3] to 134.1, i.e. by 3.6%.

Changes taking place in animal breeding also affected the value of the national agricultural efficiency ratio. Many farms, mainly smaller ones, quit small-scale rearing of production animals, mostly cows. Similar estimates as those set out in the previous paragraph indicated that this phenomenon in relation to cow rearing[4] had a slightly smaller, as in the case of the reduced area of UAA, but also positive impact on the value of the analysed ratio.

[3] According to own calculations based on data from Table 3.

[4] Such conclusions may be drawn, for example, from the study by Czułowska, Skarżyńska and Żekało (2014).

The improved efficiency of national agriculture was also due to the specialisation of production. It limited transaction costs and, in addition, farms with the specialised production did not require such a large number of machinery as farms with the non-specialised production. Therefore, they also incurred lower unit costs for the operation of the tractive force and machinery.

Changes in specialisation are demonstrated by the figures. In 2002-2010, the total number of farms decreased by 24.3%, but the number of those with the specialised production decreased by only 6.5%, while of those with the non-specialised production decreased by 47.3%.

In addition, medium-sized and larger farms, covering 18-19% of the total number of farms in the country, absorbed innovations bringing technical, biological, marketing and management progress (Karwat-Woźniak, 2013; Józwiak, Kagan and Mirkowska, 2012). However, estimates showed that farms introducing innovation held more than half of the utilised agricultural area of the country. The implementation of innovation led to the increased national agricultural efficiency ratio, but it was not possible to determine the size of this impact.

The above-information shows that a number of factors determined the improvement in the Polish agricultural efficiency ratio in the period prior to and in the year of accession, with most of them continuing the impact in the post-accession period.

In fact, it has been established, based on relevant data and using the same method of calculation as for Table 5, that between 2005 and 2007, and between 2010 and 2012 the number of non-drifting and economically active farms increased by 35 thousand, i.e. by 33.1%. This was less by as many as 31 percentage points than in the previous analysed period, i.e. in 1999-2007. These figures are confirmed in the results determined on the basis of another reasoning[5]. In 2002-2007, the number of farms with an area of 30 ha of UAA or more was growing by 2,350, on an annual average basis, while in 2007-2013 this growth rate was lower by 19.8%. Therefore, the number of such farms was growing by 1,885 on an annual average basis.

The phenomenon of reducing the growth rate in the number of larger and, as shown above, more effective farms was probably due to two reasons. One of them is the degression of rates of some subsidies for larger area farms, while the other is the unstable nationale land lease policy. In 2002-2007, the State Treasury Agricultural Property Agency, on an annual average basis, leased and sold 205.7 thousand ha, but only 113.0 thousand ha in 2008-2013 (*Rynek ziemi*..., 2016). Farms approaching the limit, whose exceeding could result in the degression of subsidy rates, refrained from increasing the utilised agricultural area, and when they were not threatened by the degression of rates, they purchased land so as to avoid losses caused by the unstable state of land lease policy. The purchase of land reduced the possibilities of investing in more profitable economic undertakings.

Moreover, the reduced animal population was also mentioned previously. Only in 2010-2015, every sixth producer quit the livestock production. This often resulted in an insufficient level of organic fertilisation of arable land and, consequently,

[5] The following studies were used for this purpose: GUS (2003); GUS (2008); GUS (2012a); GUS (2014a).

a decrease in the soil fertility (Zieliński, 2012). However, it was not possible to assess the extent to which this phenomenon impacted the value of the analysed index on a national scale, as some farms without the livestock production used various substitutes for manure, and in some cases this substitution was full.

The improvement in the value of the analysed ratio, resulting from the increased number of farms that were larger and economically active, in the post-accession period was, therefore, lower than before accession, and in addition it was limited by the decreased soil productivity due to the fact that some farms ceased breeding animals. This was probably not the only factor resulting in the decreased value of the national agricultural efficiency ratio after accession. Previously, based on analysis of the figures from Table 4, it was noted that as from 2005 the growth rate of the analysed index has slowed down to the extent which even indicated its slight downward trend. The year in which the trend changed indicates that the described phenomenon should be associated with the fact that Poland became a member of the European Union.

The existence of a relation between subsidies to farmers and income from their farms was probably indicated for the first time by Latruffe, a scientific worker at the Department of Agricultural Economics INRA in Rennes, France (Józwiak, 2008). When analysing income of a specific group of French farms, she came to a conclusion that subsidies had a negative effect on the efficiency of farms, but were conducive to their better equipping with technical means of production.

The above-quoted author, this time working in a team (Latruffe, Bravo-Ureta, Carpentier, Desjeux and Moreira, 2017), has recently specified and broadened the scope of her opinion. In analysing farms specialised in the milk production in 1990--2007 in eight EU countries, she concluded that the impact of subsidies on the efficiency was positive only in two countries (Spain and Portugal), in two it was negative (Belgium, the United Kingdom), and in other (Denmark, Germany, France and Ireland) it was impossible to determine any impact. The conclusion of the quoted study is that making direct payments to agricultural producers independent of the production volume, as introduced in 2003, has weakened the impact of subsidies on the technical efficiency of production. However, this conclusion does not answer the question of why a specific policy change in the individual countries has a different impact on farms with the same production profile?

In analysing the quoted results, it should be remembered that in the last two results of the studies, the so-called technical efficiency was analysed, whereas in the present article analysis relates to the economic efficiency measured in a different way.

The analysed phenomenon also raised interest in Poland (Bezat-Jarzębowska, Rembisz and Sielska, 2012). The research team assumed that agricultural producers, when making economic decisions, are also guided by specific agricultural policy instruments, such as, e.g. rates of direct subsidies. Thus, a question arose if this is done at the expense of striving for improving the production efficiency and, in particular, improving the labour productivity as a primary source of income growth. The model-based finding showed that transfers with the use of prices and payments increase agricultural income and further stabilise it, thus improv-

ing the labour productivity. However, the above-quoted authors add that the effect of the subsidy "… may be that they do not force to improve this performance as a primary source of income of agricultural producers" (Bezat-Jarzębowska et al., 2012, p. 54). They believe that the trueness of this finding is evidenced by the share of subsidies in agricultural income of farms: with predominant crop production, with predominant livestock production and with mixed production. This share was growing in 2004-2009.

However, the figures raise doubt. In 2009, the nominal amount of subsidies was higher than in 2004 by about 112% and, therefore, not just the actions taken by the agricultural producers, but also the change in the subsidies resulted in the increased share of subsidies in income. It results from the above that the actions taken by the agricultural producers did not have such a deep impact as suggested by authors of the cited study.

Both the study of Latruffe et al. (2017) and the study of Bezat-Jarzębowska et al. (2012) show that the agricultural efficiency is associated with the pursued common agricultural policy. However, from the former we can conclude on a possibility of a decrease in this efficiency, while from the other we can draw a deterministic conclusion that subsidies themselves, irrespective of their type, result in the decreased efficiency. These differences may result from the difference between the common agricultural policy implemented in the countries, which joined the European Union in 2004, and that implemented in the countries of the so-called old Union (EU-15).

The impact of subsidies on the national agricultural efficiency is addressed in the paper by Józwiak, Niewęgłowska and Jabłoński (2013). The authors pointed out the impact of costs of implementing the cross-compliance principle on costs incurred by national agriculture in this respect, as well as on its income, and, consequently, also on the efficiency.

The cross-compliance principle means the requirements to be met by agricultural producers making use of direct payments offered under the Common Agricultural Policy (CAP). Since the year of accession, Polish farms have been obliged to keep their land in good agricultural condition. In 2009, an additional obligation to register production animals and protect the environment was introduced, while in 2011 – the requirement to control the health of animals and crops as well as the obligation to notify certain diseases to the relevant authorities. Then in 2013 the requirement to create conditions providing the welfare of animals was introduced.

The above-quoted authors estimated additional[6] costs related to the implementation of the cross-compliance principle (purchase of services and materials, own materials and work performed using own equipment, and depreciation of fixed assets) and a reduction, for the same reason, in the value of the production obtained. On this basis, it was established that if the cross-compliance principle had not been in force, agricultural income would have been in 2013[7] higher by PLN 0.7 billion,

[6] Some of these costs were estimated using the expert method.

[7] The accounts in the quoted study were made according to the prices of 2009. They were converted to the prices of 2013 using the price change indicators for agricultural products sold and the prices of goods and services purchased by individual agricultural producers. The data from the following studies: GUS (2014b);

and indirect consumption costs would have been lower by PLN 2.3 billion. Using these figures and the figures from Table 3, concerning the situation in 2013, it was established that income would have been PLN 90.1 billion (PLN 89.4 billion+PLN 0.7 billion), while costs – PLN 63.4 billion (PLN 66.6 billion–PLN 2.3 billion). The agricultural efficiency index would be 138.8 and not 134.2 as indicated in Table 4, and thus it would be higher by 4.6 points.

There is, therefore, no doubt that a necessity to observe the cross-compliance principle contributed clearly to inhibiting the growth rate of the efficiency of Polish agriculture. However, we cannot raise objections to agricultural producers for this reason. After all, direct payments they received were a compensation for observing this principle, but have not been included in the ratios value account, which was used in the text presented for the quantitative assessment of changes in the level of this efficiency.

There was one more phenomenon related to subsidies and having a negative impact on the value of the agricultural efficiency ratio in our country. The 2010 agricultural census (GUS, 2012a) showed that in the middle of that year 386 thousand ha of UAA in Poland (3.0% of land kept in good agricultural condition) were fallowed. At the moment of carrying out the census, a part of this land was probably prepared for sowing, however, the rest was kept by its owners in a condition enabling access to subsidies. This could be a result of deliberate intention, but a reason could also be sickness, other fortuitous events, farmer's pre-retirement age, etc. However, there is no data allowing to assess the degree of impact of this phenomenon on the value of the analysed ratio.

Summary

The efficiency of Polish agriculture has been measured using the efficiency ratio being a ratio of income, excluding subsidies to costs of indirect consumption, counted together with depreciation. The efficiency indices for 2000-2013 were calculated in constant prices.

It was concluded that in the four years prior to and in the year of accession, the value of the efficiency ratio grew from the level of 122.5 to the level of 135.6. The increase was, therefore, 13.1 points and its average annual rate was 2.5%. In the nine years after accession, the value of the index was diversified and ranged in the individual years from 133.4 to 136.5. Comparing the extreme values in this period points to a poorly outlined downward trend in the values of the analysed index. This decrease was just more than 1 point, and this means that the average annual rate of decrease was 0.1%.

Several factors determined the growth of the ratio in 2000-2004.

- As a result of the targeted national agricultural policy and funds from the SAPARD and PHARE programmes, co-financed by the European Union, there was a trend with regard to the increased number of larger farms owned by natural persons and characterised by the high production efficiency. This trend

GUS (2015) were used for this purpose.

has started as early as in the beginning of the 1990s. Those farms implemented innovations bringing different forms of progress and made use of immovable properties left as a result of the disappearance of low-performance farms, mainly state-owned and cooperative.

- The share of farms characterised by the production specialisation was growing. They incurred lower transaction and fixed costs related to the operation of their machinery than farms with mixed production.
- Some farms quit cultivating poor quality farmland and smaller farms quit inefficient small-scale livestock breeding.

During the post-accession period, the majority of the above-mentioned phenomena continued, although to a lower extent, and had a positive effect on the increased national agricultural efficiency ratio. However, there were factors which reduced this growth.

- Direct payment rates for larger farms were reduced. Also, the land lease policy was variable. Both those phenomena decreased the interest of more enterprising agricultural producers in enlarging their farms as a result of land lease. The increase in the share of farms without livestock production led to the decreased productivity of soils as a result of an insufficient level of fertilising with organic fertilisers of animal origin.
- Coverage of Polish farms by the common agricultural policy resulted in a gradual increase in the number of requirements to be met by farms receiving support in a form of grants. This was the obligation to: keep land in good agricultural condition; register production animals and protect the environment; control livestock and crop health; create conditions guaranteeing animal welfare, etc. These costs, combined with the effects of the reduced growth rate in the number of larger and more effective farms, and with the effects of the increased share of farms without the livestock production, significantly reduced the value of the agricultural efficiency index in the post-accession period.
- Moreover, some farms kept land as production-ready. Therefore, they incurred negligible costs, but neither the land nor those costs could bring production results, while farm holders had access to subsidies.
- We cannot also rule out a situation where agricultural producers having an alternative: high production income, high costs and small direct payments vs small income, low costs and high subsidies bringing in total higher income, chose the other option, and this also limited the value of the Polish agricultural efficiency ratio.

Summing up, it can be concluded that the rapid increase in the efficiency of national agriculture in the period of several years prior to and in the year of accession resulted mainly from support from the domestic funds and from great economic freedom, used by farms.

The situation has changed in the years after accession. The amounts of subsidies to farms increased but so did the requirements to be met by beneficiaries of subsidies which applied to the environmental protection and animal welfare.

The agri-food industry rose the requirements regarding products of agricultural origin. The economic activity of larger farms has been limited by the degression of the rates of aid. In addition, it is likely that some agricultural producers have been mainly focused on making use of subsidies and this phenomenon was accompanied by the decreased interest in improving the efficiency of the conducted agricultural production.

Some arguments contained in the article have been based on estimates. All of them are rationally substantiated, but nevertheless the article should be considered as initial analysis of the issue.

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Annex I

Value of revenues from the Polish agriculture in 1998-2015 expressed in nominal and constant prices

Years	Agricultural revenues			Indexes of changes in agricultural revenues expressed in constant prices	
	In nominal prices in PLN billion	Indexes of conversion into constant prices	In constant prices in PLN billion	1998=100	Previous year=100
1998	48.8	1.772	86.5	100.0	-
1999	45.7	1.753	80.1	92.6	92.6
2000	49.7	1.529	76.0	87.8	94.9
2001	54.2	1.462	79.2	91.6	104.2
2002	51.0	1.581	80.6	93.2	101.8
2003	51.3	1.685	86.4	99.9	107.2
2004	60.9	1.446	88.1	101.8	102.0
2005	56.8	1.465	83.2	96.2	94.4
2006	58.4	1.417	82.7	95.6	99.4
2007	71.8	1.257	90.2	104.3	109.1
2008	72.6	1.219	88.5	102.3	98.1
2009	70.3	1.247	87.7	101.4	99.1
2010	73.9	1.147	84.8	98.0	96.7
2011	89.5	0.966	86.5	100.0	102.0
2012	93.8	0.927	86.9	100.5	100.5
2013	96.9	0.959	92.9	107.4	106.9
2014	95.1	0.968	92.1	106.5	99.1
2015	91.2	1.000	91.2	105.4	99.0

Source: as for Table 2 in the body of the paper.

Annex II

Costs of intermediate consumption in the Polish agriculture in 1998-2015 (less depreciation costs) expressed in nominal and constant prices

Years	Costs of intermediate consumption			Indexes of changes in costs of intermediate consumption expressed in constant prices	
	In nominal prices in PLN billion	Indexes of conversion into constant prices	In constant prices in PLN billion	1998=100	Previous year=100
1998	28.9	2.140	61.8	100.0	-
1999	28.2	1.994	56.2	90.9	90.9
2000	31.3	1.791	56.1	90.8	99.8
2001	33.0	1.680	55.4	89.6	98.7
2002	32.4	1.651	53.5	86.6	96.6
2003	33.5	1.615	54.1	87.5	101.1
2004	37.9	1.487	56.4	91.2	104.2
2005	36.0	1.459	52.5	84.9	93.1
2006	37.6	1.453	54.6	88.3	104.0
2007	44.7	1.372	61.3	99.2	112.3
2008	48.8	1.221	59.6	96.4	97.2
2009	46.8	1.200	56.2	90.9	94.3
2010	48.0	1.155	55.4	89.6	98.6
2011	57.2	1.063	60.8	98.4	109.7
2012	59.3	0. 995	59.0	95.5	97.0
2013	59.8	1.004	60.0	97.1	101.7
2014	61.1	1.018	62.2	100.6	103.7
2015	60.9	1.000	60.9	98.5	97.9

Source: as for Table 2 in the body of the paper.

EFEKTYWNOŚĆ FUNKCJONOWANIA ROLNICTWA POLSKIEGO W LATACH 1998-2015

Abstrakt

W rolnictwie polskim w kilkuletnim okresie przed akcesją i w roku akcesji odnotowano szybki wzrost efektywności produkcji rolniczej, później natomiast niewielki spadek. W artykule wskazano na przyczyny tego zjawiska. W pierwszym z tych podokresów istniała duża swoboda gospodarcza i nastąpił wzrost wsparcia gospodarstw rolnych udzielony głównie ze środków krajowych. W latach po 2004 roku sytuacja uległa zmianie. Wzrosły kwoty środków pomocowych, ale wzrosły też wymogi dotyczące ochrony środowiska, zdrowia konsumentów i dobrostanu zwierząt, jakie musieli spełnić rolnicy będący beneficjentami dopłat. Większe gospodarstwa rolne ograniczyły ponadto aktywność gospodarczą z powodu degresji stawek dopłat. Jest poza tym prawdopodobne, że część producentów rolnych nastawiła się głównie na korzystanie z dopłat, a zjawisku temu towarzyszył spadek zainteresowania poprawą efektywności prowadzonej produkcji rolniczej. Część wywodów zawartych w artykule oparto na szacunkach. Mają one racjonalne uzasadnienia, ale zdaniem autora artykuł należy traktować jako wstępną analizę tematu.

Słowa kluczowe: efektywność, rolnictwo, efektywność produkcji.

Accepted for print: 18.12.2018.