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Structural transformations of agriculture in Poland in the years 2006-2016

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Abstract. The article presents the changes in the productivity and effectiveness structure of Polish agriculture in the years 2006-2016 and the consequences and reasons of these transformations. The main aim of the study is to identify the most important changes in the agricultural production with an indication of their potential consequences. The data relating to the selected results in the agricultural sector at the voivodeship level was used in the study. It is stated that during the analysed period significant transformations of economic structure took place in the agricultural sector in Poland. The consequence of the conducted policy was a limitation of share of small farm holdings in the general structure. A significant increase of investment outlays also took place, which facilitated the growth of the agricultural production effectiveness. The calculations were performed with the use of the comparative analysis, the trend analysis and the Ward's method.

Keywords: agriculture, structure, CAP (the Common Agricultural Policy).

1 Introduction

The issue of structural transformations in agriculture is frequently dealt with both in domestic and foreign literature. The reason of such kind of studies is the fact that the structural transformations are still present in the rural areas, which is especially visible in agriculture as well as in the agri-business sector. Each activity of agricultural producers results in a change of resources allocation and is usually caused by the accepted strategy due to the conducted policy and influence of the market mechanisms. The transformations are supported by social and economic development, which is a consequence of the shift of economic forces between the countries. This phenomenon is defined as a process of structural adjustments. According to B. Eichengreen [6] the global structural transformations take place in line with 'the waves rule', in which an economic change taking place in a given country with time moves to other countries. The change assimilation by other regions results from the evolution of economic conditions, including: population migration, technological progress, labour costs changes or discovery of new natural resources [21]. Additionally, a term of radical innovations was presented [23], which are able to introduce to economic life innovation waves modifying the character of economic life.

Although the studies on the nature of structural transformations in economy are often conducted on the basis of the industry and services sector analysis (as the sectors of potentially high level of profitability), the phenomenon of structural transformations and the presence of waves of changes is also observed in the agricultural sector. Considering the issue theoretically, the key aspect, influenced by market structures, is prosperity resulting from connected with it effectiveness [8]. The increase of performance in this sector may be based, among other things, on the improvement of the employment structure or diversification of cultivation and breeding in the individual regions, which may be a classic example of structural transformations. It should be emphasized that the growing importance for the agriculture development have information and knowledge which are elementary resource fostering a thriving of the functioning in a modern way civil societies, their economies and regions [9].

2 The aim and methods of the study

The aim of the study was to present transformations in the productivity and effectiveness structure of agriculture in Poland in the years 2006-2016 and trends of agriculture development in the individual regions. As the reason of implementig structural transformations an accession of Poland into the European Union was considered and the possibilities in the area of using the tools of the Common Agricultural Policy. During the pre-accession period Poland used pre-accession programmes, such as SAPARD, PHARE, however, after joining the European Union entrepreneurs have had the chance to use the following: the preferential credits, export subsidies, direct payments, private storage subsidies, reference prices and others [7]. The annual results were analyzed in the studies and they were chosen due to the availability of data. The comparative analysis, trend analysis and the Ward method were used to assess the concentration of features in the individual regions.

3 Structural transformations in the Polish agriculture in total and their reasons in Poland

The Polish agriculture underwent a fundamental transformation in the 1990s that was a consequence of the social and economic changes in the Central and Eastern Europe. The second stage of evolution took place with the accession of Poland to the European Union in 2004 due to the possibility to use the tools of the Common Agricultural Policy. They had a significant impact on the transformations in many postcommunist countries and it was especially visible in relation to organisation and economic performance of farm holdings [24].

The structural transformations in the economy may be considered as a result of economic growth or as its cause [22]. In case of agriculture the most frequently is considered the analysis of consequences and reasons of structural transformation of this sector through the prism of changes regarding its effectiveness and productivity. What is more, the structural transformations may be discussed from a few perspectives:

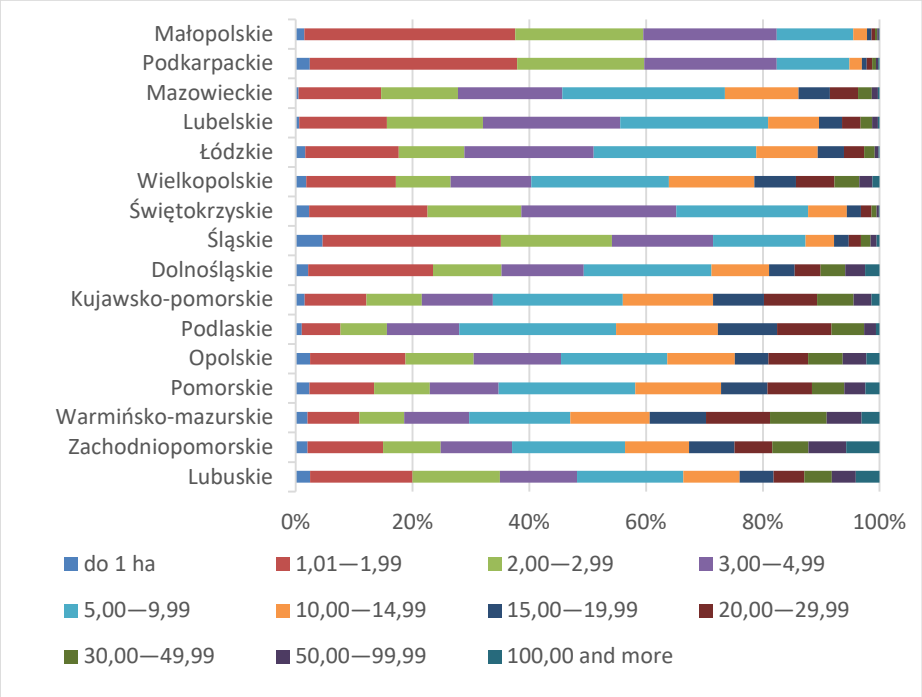
changes of the size of farm holdings, transformations of distribution of production factors, institutional links or financial conditions [2]. According to the classification proposed by J. Zegar the following structures may be included: agricultural, economic, scale, market, ecological, social and economic, spatial and the structure of type of farm holdings [30].

The tools used in the Common Agricultural Policy may stimulate the introduction of the transformations in the structure of agriculture, assuming that the support dedicated for the farmers will be based on the prior analyses of the pre-existing structure of agricultural production and recommendations resulting from it [3]. The appropriate focus of the support based on the current assessment of the changes in agriculture is essential.

4 Structural transformations in agriculture in Poland

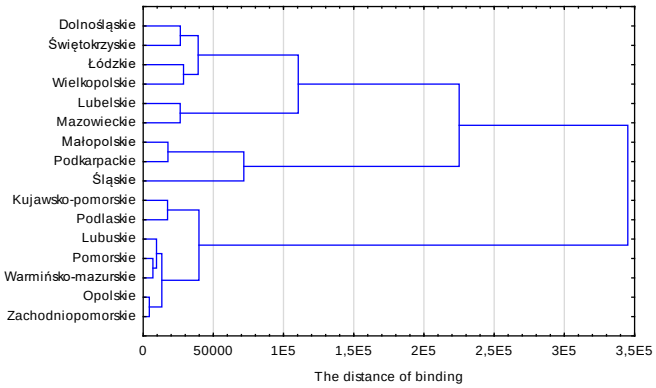
Poland has agricultural area resources that compared to the other European countries may be considered as significant. Similar resources to Poland in terms of area have the following European Union countries: Great Britain, Germany, Romania and Italy, larger only France and Spain [5]. Analysing the structure of the agricultural areas of the other countries it may be emphasized that it contains mainly of big and very big farm holdings – in accordance with the statistical data the farm holdings with over 50 hectare account to 34,2% in Denmark, 28,4% in Germany and 29,9% in the Czech Republic and 12,2% in Slovakia [20]. The politics that lead to the present state of affairs was different in the regions (in Germany it was diversification policy aiming at building the structure based on coexistence of big farm holdings and sall family farm holdings [4]) and additionally it covered long periods (in Denmark development to the current structure lasted over one hundred years [19]).

Fig. 1. Farm holdings according to the area groups in 2016.



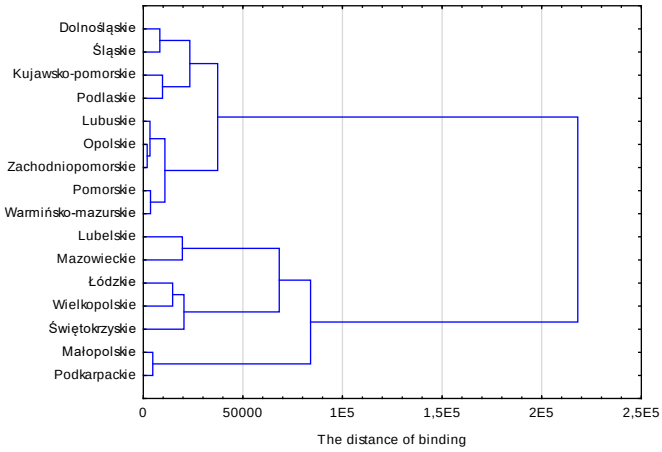
Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

Fig. 2. Similarities between voivodeships in terms of the area structure of farm holdings in 2006.



Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

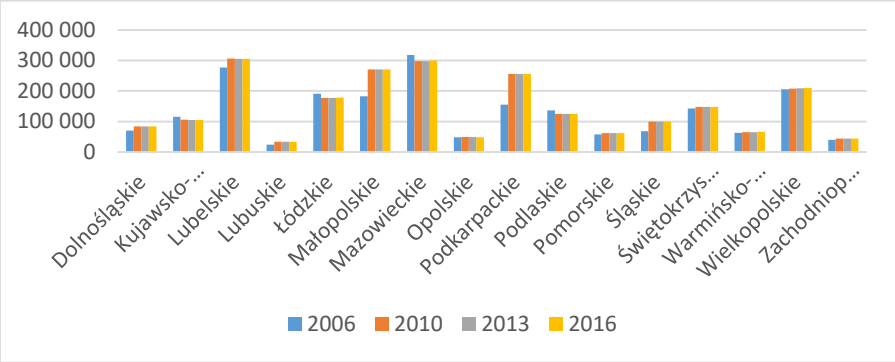
Fig 3. Similarities between voivodeships in terms of the area structure of farm holdings in 2016.



Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

One of the main aims of the Polish agriculture is to increase an average area of the farm households [12]. The agricultural transformations in Poland taking place recently have far-reaching social and economic consequences that require taking into account such phenomena as specialisation, concentration and intensification of production. The agricultural policy in our country needs an evolutionary model of structural transformations of individual farm holdings [29]. During the analysed period the significant transformations of the area structure of agriculture in Poland took place, as presented in figures 1-3. Podkarpackie and Malopolska voivodeships are characterised by the biggest fragmentation and farm holdings below three hectares constitute over half of the agriculture structure in these regions. The largest increase in the number of farm holdings with the area over 50 hectares during the analysed period was in the following voivodeships: Wielkopolska, Masovian and Lublin. In addition, the progressing process of polarisation into two groups of voivodeships with different features in relation to the farmland area may be noticed (fig. 2 and 3).

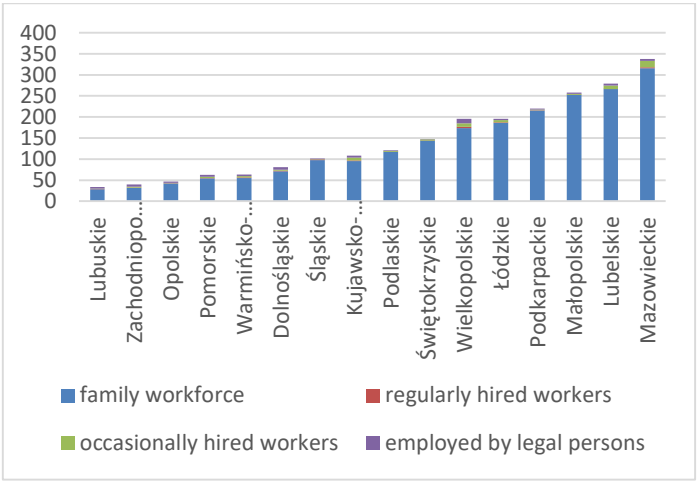
Fig. 4. Working in agriculture according to voivodeships.



Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

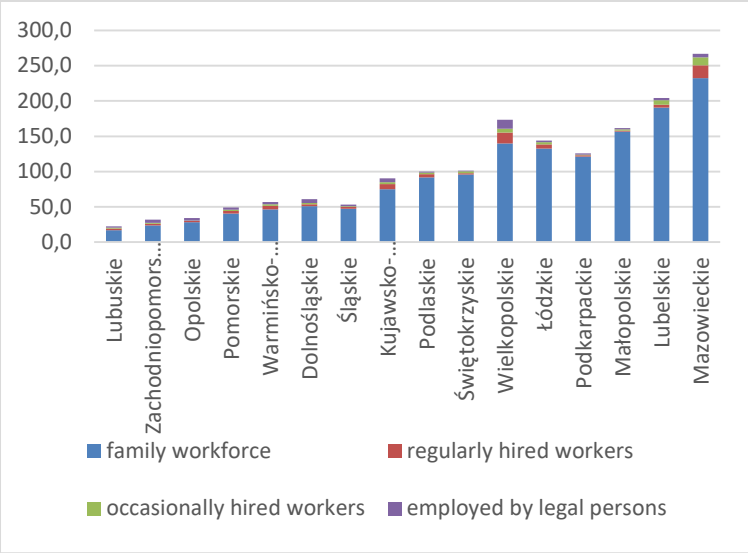
The important consequence of the accession of Poland to the European Union was the transformation at the level of employment in the individual sectors. This phenomenon was visible in relation to the rapid increase of the number of employed in the service sector with the structural loss (percentage decrease of the share of employed in the given sector in relation to the whole country economy) for other sectors, especially agriculture [10]. In spite of the ongoing transformations in terms of value the agriculture sector has not recorded significant decline in the employment, and on the contrary in the selected voivodeships such as Malopolska or Lublin a significant growth of employment in this sector was recorded (fig. 4).

Fig. 5. The labour input in farm holdings in 2006.



Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

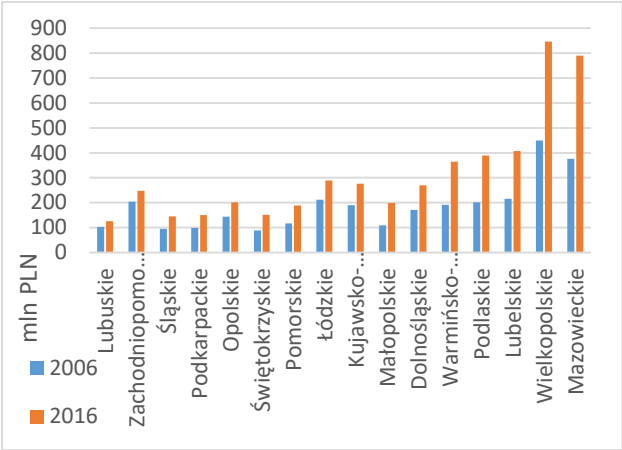
Fig. 6. The labour input in farm holdings in 2016.



Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

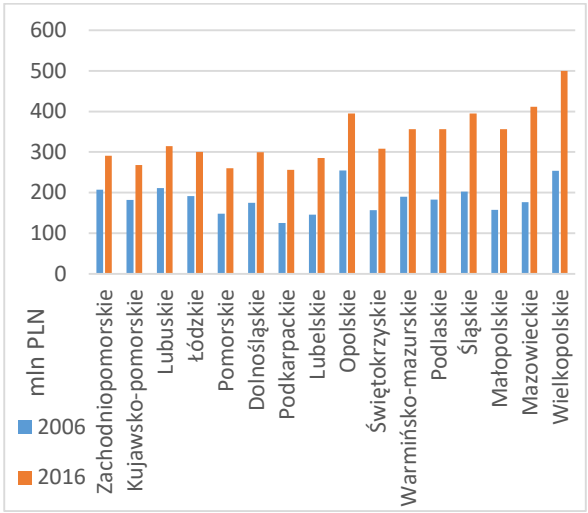
The high number of people employed in agriculture proved to be an essential factor limiting the growth of agricultural production effectiveness in Poland [14]. As a consequence, there has been a reduction of agriculture modernisation and lower productivity of the sector in the country [1]. The process of limitation of employment stimulates the changes of rural areas modernisation [25]. Additionally, the shift of workforce from agriculture to non-agricultural activities supports the improvement of not only farmers income but also other inhabitants of rural areas [11]. As presented in figures 5-6 during the analysed period in Poland there was a significant drop of labour input in agricultural sector. These changes were especially visible in the voivodeships with the high level of labour input in the sector, including Podkarpackie and Malopolska voivodships that were characterised by, indicated earlier, high farm holdings fragmentation. Moreover, the increase of employment of employed persons in Wielkopolska and Malopolska regions may be observed.

Fig. 7. Investment outlays in agriculture and hunting for 1 ha agricultural area in PLN.



Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

Fig. 8. Investment outlays in agriculture and hunting for 1 ha agricultural area in PLN,



Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

Table 1. Changes of purchasing agricultural products for 1 hectare in the years 2006-2016 in Poland (counted year/year in kg/ha, 1t/ha).

Transformation Year/Year	2010/2006	2016/2010	2010/2006	2016/2010	2010/2006	2016/2010	2010/2006	2016/2010	2010/2006	2016/2010	2010/2006	2016/2010
Voivodship	**Basic cereals**		**Potatoes**		**Slaughter Livestock**		**Cattle**		**Pigs**		**Milk**	
Dolnośląskie	39%	31%	26%	25%	1%	4%	17%	-2%	-24%	-53%	-5%	9%
Kujawsko-pomorskie	18%	26%	8%	93%	-2%	53%	-37%	118%	-11%	44%	5%	23%
Lubelskie	1%	39%	29%	44%	10%	14%	11%	-6%	-12%	6%	-8%	4%
Lubuskie	47%	50%	50%	489%	22%	40%	2%	27%	1%	12%	15%	-7%
Łódzkie	38%	-4%	7%	145%	-5%	48%	-17%	82%	-15%	39%	11%	13%
Małopolskie	-13%	129%	85%	29%	-2%	-5%	7%	-45%	-8%	-7%	7%	4%
Mazowieckie	61%	25%	-3%	4%	24%	80%	11%	53%	-8%	3%	14%	32%
Opolskie	67%	46%	-6%	20%	44%	-7%	5%	-14%	40%	-19%	15%	15%
Podkarpackie	41%	61%	92%	178%	20%	7%	-10%	-24%	11%	7%	4%	16%
Podlaskie	0%	33%	-6%	146%	13%	30%	55%	-2%	-18%	-3%	14%	27%
Pomorskie	17%	49%	58%	13%	154%	74%	282%	23%	85%	77%	11%	42%
Śląskie	29%	49%	100%	500%	47%	15%	47%	4%	-6%	-2%	19%	31%
Świętokrzyskie	118%	75%	250%	86%	35%	46%	29%	62%	11%	26%	1%	14%
Warmińsko-mazurskie	6%	-15%	-18%	78%	19%	26%	5%	39%	0%	19%	15%	20%
Wielkopolskie	89%	14%	7%	124%	0%	41%	6%	69%	-9%	20%	13%	39%
Zachodnio pomorskie	56%	38%	59%	46%	26%	15%	-47%	-20%	8%	-27%	1%	5%

Source: own studies based on data from the Polish Central Statistical Office (GUS), http://stat.gov.pl/, downloaded: 23.08.2018.

The transformations of the structure of agricultural sector may be clearly observed on the basis of transformations of agricultural production. Although there is a distinctive variety in production between voivodeships (resulting from, among others, different quality of soils and other natural factors [16]) a common tendecy of the effectiveness improvement in various types of production in the whole country may be noticed. The cultivations, especially potato-growing, is characterised by the largest

increase of productivity. In the whole country this growth began from the average level of 62 kg/ha in 2006 to the level of 129 kg/ha in 2016. The biggest changes were recorded in Silesia, Świętokrzyskie and Lubuskie. In case of animal production the significant characteristics in the production of pigs for the Polish agricultural market may be observed. The values for this farming were systematically limited in the majority of voivodeships in the whole country. The only exception is Pomorskie voivodeship where this value increased from the level of 107 kg/ha in 2006 to 349 kg/ha in 2016, therefore the national averages for these years were successively 137 kg/ha and 159 kg/ha, showing an progressing trend. The direction of reducing pork production in Poland results from mitigation of phenomena of pig cycles [18] through the import of meat from the other European Union countries. In case of the remaining farming, as well as cows' milk production, the increase was recorded, which also resulted (by relocation of production resources) in the reduction of pork production.

5 Conclusion

The aim of the study was an attempt to capture the structural transformations in agriculture that accompany a long term economic growth. The attempt to discribe and explain the selected phenomena in this area of production in Poland was undertaken. In the presented analysis a specific perspective was adopted in which the development is perceived as a resultant of the production factors efficiency measured by the effectiveness of the sector. On such a basis the considerations concerning transformations of factors structure (capital and work) as well as the effects of production in agriculture were undertaken.

1. During the analysed period 2006-2016 in Poland significant transformations of economic structure in agricultural sector took place resulting mainly from accession of Poland to the European Union as well as the Common Agricultural Policy.
2. The most important consequences of the policy implemented in this period included a decrease of participation of small farm holdings in the general structure, which was a result of the progressing sector consolidation as an answer for the the agricultural policy. Even though this evolution contributed to the reduction of the labour input in the sector it did not influence on the reduction of the number of agricultural employees.
3. During the analysed period there was a significant increase of investment outlays in all analysed areas, which supported the increase of agricultural production effectiveness, especially potatoes. In farming a change of structure in terms of relocation of production resources from beef farming to other animals farming was noticed.

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