ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 15 (4) 2016, 53–63*

LAND AND LABOUR PRODUCTIVITY IN POLISH AGRICULTURE AGAINST HIGHLY-DEVELOPED COUNTRIES OF THE EUROPEAN UNION

Andrzej Czyżewski, Jakub Staniszewski
Poznań University of Economics and Business

Abstract. The paper is a comparative analysis of land and labour productivity in Poland and those member states of the European Union (EU) most resembling Polish conditions in terms of agricultural production structure – Germany, France and Denmark. The diversity of productivity was presented in division into farm groups of various area of utilised agricultural area (UAA) and economic power. The research, carried out on the basis of data of 2013, enabled to identify the fact that small and medium agricultural holdings in Poland are more efficient than similar size farms in comparable member states of EU-15 which, however, does not influence a higher productivity of the whole sector since it depends on the results of the economically largest farms. Dividing farms into groups according to the UAA leads to conclusions that the labour factor is most efficiently used in small and big agricultural holdings, and the land factor – in medium farms.

Key words: production structures, agriculture, comparative analysis

INTRODUCTION

The accession of Poland into the EU structure is connected with the number of opportunities which are available to agricultural producers and they mostly result from the participation in Single European Market (SEM) and execution of Common Agricultural Policy (CAP). Hence, the integration of national agricultural markets with the markets of "old" member states stimulates the process of price and demand rise and it also means the inclusion of national farming into the external tariff protection system [Tomczak and Wilkin 2003]. Yet to retain competitiveness within the framework of SEM, the agriculture of "new" member states requires adjustable processes which consist in increasing the use productivity of possessed resources. In a microeconomic approach, stating the existence

Corresponding author: Jakub Staniszewski, Poznań University of Economics and Business, Department of Macroeconomics and Agricultural Economics, Świetlana 15/1 60-151 Poznań, Poland, e-mail: Jakub.Staniszewski@ue.poznan.pl

of productivity or its lack, requires juxtaposing the input and output of a given economic system [Kulawik 2007]. However, in a macroeconomic approach this productivity is determined by the production structure [Pajestka 1981]. Therefore the necessary condition of productivity improvement of production factors use in agriculture is the influence on production structures. However, the evolution of those structures progresses slowly, especially in case of farming where a significant role is played by immobile, highly-specific land factor whose lower efficiency negatively influences the productivity of other production factors and decreases competitiveness of the whole sector [Kusz 2012]. Moreover, CAP executed by the EU is nowadays based on a paradigm of a sustainable growth and it does not force the growth of production efficiency to such extent as it was in the past. The improvement of farming productivity is connected with the sustainable management of natural resources which means that an economic growth which is too dynamic can be regarded as a potential threat to maintain and increase farming productivity in the future [Floriańczyk and Rembisz 2012]. Meanwhile, new member states deviate from the EU-15 to a significant degree within this field which can impinge on their competitiveness. This thread is well presented by Czyżewski [2012] who acknowledges that in the context of Poland the farming capital accumulation is more rational from the point of view of economic and social order (on condition that it does not disrupt the environmental order in the EU) than investments in ecologisation in the face of obtained comparative advantages. The key fact to understand that problem is the answer to the question to what extent Polish agriculture lags behind other EU member states in terms of production factors efficiency and what is the connection with varied structural conditions of farming production. The aim of the paper is the interpretation of diverse labour and land productivity in the context of the EU-15 member states similar to Poland in terms of production structure, including the existing differences found in their farming structure.

DISCUSSION

Literature already presents international comparisons of farming productivity. Floriańczyk [2008] quantified the productivity of resources use in the EU member states' agriculture in period of 1999–2005, at the same time indicating that although the progress within this area was present in most the EU countries but its sources were different. In case of old member states it mostly resulted from technical advances, while new member states still had reserves in the way existing resources could have been used. Baer-Nawrocka and Markiewicz [2013] on the basis of the research on production factors productivity in member states of the EU-25, find the main determinant of use efficiency of production factors to be their mutual relations. Among the research on the consequence of international diversity of farming productivity the research of Kołodziejczak and Poczta [2002] must be mentioned, in which while comparing the efficiency of using the production factors in Poland and the EU-15 member states the researchers conclude that it is low productivity of production factors which decides about the spared production potential of Polish farming. The research carried on by Baer-Nawrockiej and Markiewicz [2012] focuses on analysing labour productivity in farming and it identifies the progres-

sing convergence within that field between farming regions of "the new and old EU". In turn Floriańczyk and Rembisz [2012] study how the growth in farming productivity determines its profitability and to what extent it is a function of increasing transfers. The results of the EU member states in a period of 2002–2010 indicate a growing transfer in incomes of new member states and a relative stability in the countries of the "old EU", along with the deterioration of productivity of the used production factors. Although, the above quoted research identifies the problem of low productivity of production factors in Polish agriculture against the EU-15 farming, they do not link them with structural conditions. In some measure that subject matter is presented in the work of Smędzik-Ambroży [2010], however, it is limited to analysing the diversity of productivity of Polish farms of various production types. In further research [Czyżewski and Smędzik 2010], which also covers the variety of agricultural holdings sizes, it is shown that the area is a much more significant factor differentiating productivity than the type of production. The research of Rzeszutko [2014] in which the author identifies a significant influence of relations between agricultural production factors and farming productivity in regions of Poland also seems interesting. Błażejczyk-Majka et al. [2011] deduce, while studying the dynamics of technical efficiency of agricultural production in 12 member states of "the old EU" in a period of 1989–2007, that "maintaining high efficiency in farming sector is possible thanks to a very low demand for land and labour and systematic decrease of fixed assets converted into the production size". In studying individual constituent elements of a total productivity, a division into moderate and Mediterranean climate regions emerged. Therefore, one can state that it is a common knowledge of a lower productivity of Polish agriculture in comparison to farming of the EU-15, however, the understanding of the reasons of such state of affairs still seems to require more analysis.

MATERIAL AND METHODS

The key element of success in realisation of assumed purposes is an appropriate choice of countries which will take part in the productivity comparison of production factors in agriculture. A taken choice criterion was the production structure represented by the variables illustrating the share of particular production in generating its full value and using UAA. The justification of such an approach is the conviction that the comparison of agricultural production efficiency is measurable only in case of agricultural holdings of similar production profile. A total productivity of a sector changes, depending on the type of production which is dominant in particular economy. Moreover, being aware of a significant influence of environmental variables (climate, land form, soil quality) on agricultural productivity and hindered measurement of those phenomena, an assumption was made that the answer to diverse climate conditions is the differentiation of farming production. Since it can be assumed that the agro-technical knowledge that farmers possess allows them to adjust the type of production to environmental conditions, therefore these structures can be a kind of "information medium" of the quality of agricultural production space. To measure the differentiation of a production structure of Poland and the other EU member states an index proposed by Kukuła [2010] was used, the formula of which is as follows:

$$\upsilon_{pl} = \frac{\sum_{i=1}^{k} |a_i - \beta_i|}{2} \quad (1)$$

where:
υ_{pl} – index of differentiation of production structure between Poland and member state;
k – number of EU member states;
i – EU member state;
α – a structure vector of a member state comparable to Poland;
β – a structure vector of Poland.

This indicator uses so-called urban distance for comparisons and its measure is normalised, ranging from [0, 1], while 0 means a maximum convergence of structures and 1 means maximum divergence. Obtained convergence results serve to choose three member states of the EU-15 of most comparable to Poland agricultural production structure. To present the efficiency of production factors use the measures of the efficiency and resource-absorption ratios were used [Pajestka 1981] which can be as follows:

Table 1. Variables used in the analysis of agricultural production structures of Poland and chosen EU member states

Variable	Description
Farm labour force	labour force, directly or non-directly employed by the holding, expressed in annual work units (AWU[g]), per holding, divided into groups according to utilised agricultural area[a] (UAA) and due to standard output[b] (SO[h])
Agricultural land use	utilised agricultural area in ha, per holding divided into groups according to utilised agricultural area, by land use[c] and due to standard output [d] (SO)
Number of agricultural holdings	number of agricultural holdings divided into groups according to utilised agricultural area, by land use[c] and due to standard output[d] (SO)
Size of standard output	a total standard output in euros, in individual group divided into groups according to utilised agricultural area, by land use[c] and due to standard output[d] (SO)
Value of produced agricultural products	value of produced agricultural products (excluding the value of provided services), in producer's prices (excluding taxes and subsidies to products), expressed in millions of national currency, divided into different types of products[e]
Direction of agricultural land use	utilised agricultural area in ha, per specified direction of agricultural production[f]

Eurostat codes: [a]ef_olfaa; [b]ef_lflegecs; [c]ef_kvftaa; [d]ef_kvftecs; [e]aact_eaa01; [f]ef_oluft; [g]Regarding a big input of part-time labour and seasonal employment of temporary workers, the labour input in agriculture was expressed in conventional annual work units (AWU). AWU corresponds to the work performed by one person who is occupied on an agricultural holding on a full-time basis. In Poland it is assumed to be 2120 hours performed a year as an equivalent of full-time work (annual work unit) [GUS 2015]; [h]SO – standard output is the 5-year average of an agricultural product (crop or livestock), is the average monetary value of the agricultural output at farm-gate price, in euro per hectare or per head of livestock in a year, in average conditions for individual region [GUS 2015].

Source: Eurostat database (http:// ec.europa.eu/eurostat/web/agriculture/data/database (accessed: 21.01.2016).

$$P_a = \frac{Y}{a} \tag{2}$$

$$C_a = \frac{a}{Y} \tag{3}$$

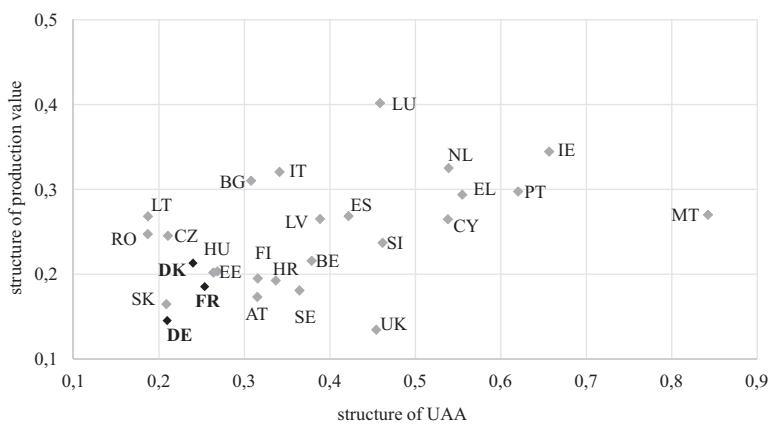
where:
P_a – productivity of production factor a;
Y – total production;
a – factor a resources;
C_a – use absorption of production factor a.

The research uses Eurostat data collected within Farm Structure Survey. The detailed description is presented in Table 1.

Agricultural structures will be presented in two dimensions – divided according to the criterion of holding size (area) and according to their economic size measured by SO. Then, for each subcategory of area and economic size, the ratios of labour and land productivity will be calculated. Due to the lack of data of an appropriate aggregation level, capital factor was omitted.

RESULTS

As a result of the above described procedures the convergence indices of production structure and UAA use structure were obtained for 28 member states of the EU (Fig. 1). The closer to the origin of coordinates an individual country is, the bigger the convergence with production structures of Poland is.



BE – Belgium, BG – Bulgaria, CZ – Czech Republic, DK – Denmark, DE – Germany, EE – Estonia, IE – Ireland, EL – Greece, ES – Spain, FR – France, HR – Croatia, IT – Italy, CY – Cyprus, LV – Latvia, LT – Lithuania, LU – Luxemburg, HU – Hungary, MT – Malta, NL – the Netherlands, AU – Austria, PT – Portugal, RO – Romania, SI – Slovenia, SK – Slovakia, FI – Finland, SE – Sweden, UK – The United Kingdom.

Fig. 1. Convergence of agricultural production structure and utilised agricultural land use between Poland and other member states of the EU in 2013

Source: Own elaboration on the basis of Eurostat data (accessed: 21.01.2016).

Data presented in Figure 1 indicate that further research should include following countries: Germany, France and Denmark (from the group of the EU-15). The first of these countries is characterised by the biggest convergence of production structures when compared to Poland, the convergence of the other two is significantly lower. Despite a relatively high level of convergence between enumerated countries and Poland, one can distinguish several fields in which those member states differ significantly from one another. Analysing the structure of utilised agricultural area use we can notice a dominant role of cereals[1] in Poland (52%) and Denmark (55%), along with a significantly lower share in Germany (39%) and France (35%). Denmark alone stands out from the rest of the group in terms of the share of meadows and pastures which, in this member state, is visibly lower (7% against 22–30% in other countries). The situation of Poland is similar when it comes to fodder crops (6% against 17–22% in remaining member states). It is worth to pay attention to a relatively big share (although on a small scale regarding a total area of UAA) of fixed cultivation of fruit and vegetables in Poland (2.5% against maximum 0.6% in other member states) and vineyards in France (2.86% against 0.6% in other countries). Concerning the structure of agricultural products value the analysed countries were more convergent, although even in this field some lagging differences can be noticed. In the field of livestock Denmark stands out compared to other countries and its share in a total production is definitely higher (38% against 24–28%). In case of animal products France has a definitely lower share in their production structure (15% against 22–28%). Poland, in turn, is characterised by a significantly bigger share of vegetable and fruit production and kitchen gardens (16% against 7–12%). In German production structure a relatively essential part consists of fodder crops (16% against 4–9%), in France it is wine (14% against maximum 2.4%). Clearly, it can be seen that although all the analysed countries belong to the EU-15, even in this group there is significant divergence. For further analysis the data concerning agricultural holdings divided into groups of economic size (Table 2) and UAA (Table 3) were used.

Data presented in Table 2 prove a common belief on a higher productivity of labour force in economically stronger agricultural holdings, which results from a production concentration and returns to scale. However, the pace at which, along with the increase in production, the productivity grows, differs in individual countries. In case of labour force efficiency it grows steadily, especially in Germany and France, though in the groups of the strongest agricultural holdings Germany stands out positively (upward) compared to France. Denmark is characterised by a slightly lower productivity in the group of the smallest farms, but still, in all other groups, especially in the group of the strongest agricultural holdings, uses labour force most efficiently. Comparing the differentiation[2] of efficiency in individual countries, one can see that it grows along with the economic force of the agricultural holdings to reach its maximum in the group range of 8–15 thousand EUR of SO and then it starts decreasing. It is equally high, as in the mentioned group, in the group of the strongest agricultural holdings, however, it results from a much higher variability in Denmark. Polish agriculture is characterised by the lowest labour

[1] The aggregate cereals include wheat (common, durum and spelt), rye, barley, oats, grain maize, rice and other cereals.
[2] To quantify the differentiation level the variation ratio was used.

Table 2. Productivity of land and labour in agricultural holdings of different economic size in 2013 in Poland, Germany, France and Denmark

SO (thousand EUR)	<2	2–4	4–8	8–15	15–25	25–50	50–100	100–250	250–500	>500
					EUR·AWU^{-1}					
Poland	1 395	2 713	4 244	6 916	10 521	16 912	29 907	54 076	79 384	95 404
Germany	3 310	6 976	11 615	17 813	23 462	31 871	45 874	77 376	126 894	135 313
France	2 684	6 962	11 612	15 658	21 814	31 236	50 193	81 655	109 137	123 577
Denmark	2 426	6 781	16 383	25 894	34 615	44 638	65 183	100 222	157 582	260 657
					EUR·ha UAA^{-1}					
Poland	578	819	954	1 136	1 385	1 603	1 729	1 982	2 182	2 733
Germany	128	525	830	1 064	1 230	1 500	1 939	2 516	3 205	3 429
France	151	345	553	807	977	1 041	1 263	1 727	2 534	6 265
Denmark	111	335	841	1 131	1 258	1 298	1 429	1 775	2 734	5 552
					EUR·agricultural holding^{-1}					
Poland	1 131	2 895	5 716	10 981	19 318	34 936	67 998	147 204	343 751	1 341 425
Germany	1 045	3 188	6 159	11 239	19 618	36 094	72 557	161 860	346 375	1 161 145
France	972	3 008	5 881	11 297	19 779	36 580	73 089	161 858	337 886	895 176
Denmark	1 258	2 991	6 202	11 304	19 598	35 813	71 384	159 083	362 152	1 246 978

Source: Own elaboration on the basis of Eurostat data (accessed: 21.01.2016).

force productivity in all the groups. The smallest difference[3] is noted in the group of SO of 150–200 thousand euros, while the biggest is in the SO group of 4–8 thousand EUR. Similar observations can be made in relation to land productivity, in case of which the influence of production concentration and returns to scale is also visible, smaller though than in case of labour force efficiency. It means that the land productivity growth, conditioned by the increase of production scale, is smaller than the growth of labour efficiency. As far as the growth comparison among the countries is concerned, then in this case they are more alike, although all the analysed member states clearly differ in terms of land productivity in the group of the strongest agricultural holdings (more than 500 thousand EUR of SO). However, the biggest diversity was in the group of the smallest farms (less than 2 thousand EUR of SO), the smallest in the group of medium agricultural holdings – the group of 15–25 thousand EUR of SO. Polish situation looks interesting against other analysed countries. Since, it appears that land productivity in Polish agriculture is the highest in all the groups where SO is less than 50 thousand EUR. Only the highest scale of production determines relative deterioration of Polish position. This leads to interesting

[3] To measure the level in which Poland lags behind other examined countries in analysed group an average of labour efficiency differences in Polish agriculture and it was confronted with an average efficiency of a whole group.

conclusions that in Poland small and medium agricultural holdings are more efficient than in compared EU-15 countries which, however, does not influence a higher efficiency of all the sector, because here, a crucial impact has the size of the group and its share in the use of the land. In Poland up to 63% of the UAA is allocated in groups, which are characterized by higher land productivity, than in Denmark, France and Germany, where share of the analogical groups in total UAA is 12–14%. This should result in overall higher land productivity in Poland than in comparable countries. It turns out, however, that the SO per ha in Poland is only 1,513 EUR, while in France 2,052 EUR, in Germany 2,770 EUR and in Denmark 3,657 EUR. On the worse productivity of land in Poland decisive impact has therefore less efficient land use in the strongest economically farms (over 250 thousand EUR SO), which much stronger stand out downward from similar farms in comparable countries, than weaker holdings stand out upward in their "categories". Finally, it is worth to study the statistics of an average production of an agricultural holdings coming from each group. It turns out that in this field the diversity is relatively low – it is only significant in case of the smallest and medium farms. The most interesting fact is that among the latter the highest productivity is characteristic for Polish agricultural holdings.

Another field of comparison includes farms grouped according to their physical size, that is UAA (Table 3). However, from the beginning, some drawbacks of this analysis must be stated. It will be obscured by specialist farms which do not cover a big area and which substitute that fact by capital. They will inflate the economic results of the smallest

Table 3. Productivity of labour and land in agricultural holdings of various UAA in 2013 in Poland, Germany, France and Denmark

UAA (ha)	0	<2	2–5	5–10	10–20	20–30	30–50	50–100	>100
EUR·AWU^{-1}									
Poland	58 410	3 047	4 013	6 999	12 487	20 294	28 844	43 089	66 881
Germany	264 800	45 560	45 804	30 810	38 180	51 808	69 032	106 014	124 489
France	135 706	28 936	38 453	49 213	52 015	57 006	63 290	76 714	105 708
Denmark	170 994	104 106	96 751	56 540	62 456	78 763	88 900	136 853	228 307
EUR·ha UAA^{-1}									
Poland	×	1 992	1 404	1 434	1 583	1 633	1 598	1 396	1 171
Germany	×	68 660	23 802	3 696	2 854	3 023	3 085	3 160	2 148
France	×	24 577	10 472	8 063	5 375	3 622	2 778	1 988	1 426
Denmark	×	685 877	39 325	4 187	3 120	2 518	2 366	2 843	3 536
EUR·ha UAA^{-1}·agricultural holding^{-1}									
Poland	×	1.34	3.25	7.08	13.79	24.12	37.93	67.73	277.97
Germany	×	1.01	3.35	7.31	15.02	24.84	39v04	70.69	270.60
France	×	0.92	3.30	7.14	14.22	24.59	39,58	72.34	175.92
Denmark	×	0.55	3.56	7.20	14.34	24.71	38.70	72.03	229.44

Source: Own elaboration on the basis of Eurostat database (accessed: 21.01.2016).

farms concerning the area. Therefore to show the whole picture this statistic should be presented when divided into three types of production farms. Nevertheless, such problem approach exceeds the frames of this paper. Within labour productivity a specific polarization can be noticed. It manifests itself in high labour efficiency in small and big agricultural holdings and low among the medium ones. Amongst examined countries the "polarisation" trend is convergent, however, labour efficiency alone differs significantly among the member states (average variation coefficient of approx. 51%). Also Polish results differ significantly from other countries, although along with the growth of farm size that "disparity" diminishes. However, the most interesting are the statistics which concern land productivity. Since it appears that negative influence of a decreasing incomes effect is stronger than positive returns to scale and along with the rise of UAA in agricultural holding their average productivity falls. In case of Germany, France and Poland land is the least productive in farms above 100 ha of UAA, while in case of Denmark it reaches its minimum in medium agricultural holdings – 30–50 thousand ha of UAA. It is also interesting that the variation of the analysed characteristic in the collective is significant but decreases forward the group of medium farms. It means that the smallest difference is perceived in the group of farms of 30–50 ha. The situation is very similar in case of lower land productivity in Poland – a relative difference is also the smallest in this range. In turn, comparing the average area of farms in each group, like in the analysis concerning economic size, also here in all the groups, except the extreme values, the results are similar.

CONCLUSIONS

The above presented research allows to draw following conclusions:

- The EU-15 member states of most similar production structure to Poland are Germany, France and Denmark, at the same time we can distinguish production directions in which Poland and mentioned countries differ significantly among one another. It mostly concerns the production of cereals, the share of meadows and pastures and the share of fodder crops in a total area of UAA.
- The research confirmed the presence of returns to scale in agriculture of all analysed countries which refer to farms ordered according to SO value whereas they are stronger in case of labour than land productivity. The differentiation among the countries is also higher involving labour productivity. Poland especially stands out from the EU-15 member states when considering labour efficiency. When it comes down to land productivity, than in groups of small and medium agricultural holdings (SO below 50 thousand EUR) that indicator was the highest in Poland. Small and medium farms in Poland are more efficient than in other compared EU-15 member states which does not influence a higher efficiency of the whole sector, which depends on results of economically largest agricultural holdings, which are significantly worse in terms of land productivity than the corresponding size farms in the comparable EU-15. An average SO per holding is generally lower in Poland (Polish farms are economically weaker), however, it does not concern the group of the biggest farms in which this indicator is the highest in Poland of all analysed countries.

- Among the farms, ordered according to UAA, we can notice a certain "polarisation" which manifests itself in the highest labour efficiency in small and big farms, and, in turn, low efficiency in case of medium agricultural holdings. While grouping the holdings according to the area of UAA the differentiation among the countries is also much bigger. In case of land productivity we can observe negative returns to scale – the productivity diminishes along with the rise of farms' area, although these results should be approached with caution because they can be influenced by the lack of distinction between production types.
- For Poland increasing agricultural labour productivity should be particularly important and it can be achieved by increasing mechanisation or transfer of excess labour force to non-agricultural sectors; such actions seem to be more urgent than changes of agricultural structure which characteristically is long-term for Polish agriculture lags behind other examined member states much more in case of labour than land productivity.

REFERENCES

Baer-Nawrocka, A., Markiewicz, N. (2012). Procesy konwergencji/dywergencji w zakresie wydajności pracy w rolnictwie Unii Europejskiej – analiza regionalna. Journal of Agribusiness and Rural Development, 3 (25), 13–23.

Baer-Nawrocka, A., Markiewicz, N. (2013). Relacje między czynnikami produkcji a efektywność wytwarzania w rolnictwie Unii Europejskiej. Journal of Agribusiness and Rural Development, 3 (29), 5–16.

Błażejczyk-Majka, L., Kala, R., Maciejewski, K. (2011). Efektywność produkcji rolniczej na obszarze Unii Europejskiej w latach 1989–2007. Zeszyty Naukowe SGGW w Warszawie, Problemy Rolnictwa Światowego, 11 (26), 1, 28–38.

Czyżewski, A., Smędzik, K. (2010). Efektywność techniczna i środowiskowa gospodarstw rolnych w Polsce według ich typów i klas wielkości w latach 2006–2008. Roczniki Nauk Rolniczych, G, 97 (3), 61–71.

Czyżewski, B. (2012). Produktywność zasobów w rolnictwie w Polsce wobec paradygmatu zrównoważonego rozwoju. Studia Ekonomiczne, 2 (73), 165–188.

Floriańczyk, Z. (2008). Produktywność polskiego rolnictwa w pierwszych latach członkostwa w UE na tle wybranych krajów europejskich [In:] A. Alińska, Z. Floriańczyk, T. Toczyński (Eds), Zagadnienia produktywności, regionalnego zróżnicowania nakładów pracy i kredytowania produkcji rolniczej w świetle Rachunków Ekonomicznych dla Rolnictwa. Raport. IERiGŻ, Warszawa.

Florianczyk, Z., Rembisz, W. (2012). Dochodowość a produktywność rolnictwa polskiego na tle rolnictwa unijnego w latach 2002–2010. Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie, Problemy Rolnictwa Światowego, 12 (1), 53–62.

GUS (2015). Rocznik Statystyczny Rolnictwa 2014. Zakład Wydawnictw Statystycznych, Warszawa.

Kołodziejczak, M., Poczta, W. (2002). Analiza efektywności wykorzystania czynników produkcji i ich nakładów w rolnictwie polskim i unijnym. Roczniki Naukowe SERiA, 4 (2), 132–137.

Kukuła, K. (Ed.) 2010. Statystyczne studium struktury agrarnej w Polsce. PWN, Warszawa.

Kulawik, J. (2007). Wybrane aspekty efektywności rolnictwa. Zagadnienia Ekonomiki Rolnej, 1, 3–16.

Kusz, D. (2012). Egzogeniczne i endogeniczne uwarunkowania procesu modernizacji rolnictwa. Roczniki Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich, 99 (2), 53–67.

Pajestka, J. (1981). Czynniki i współzależności rozwoju społeczno-gospodarczego. Determinanty postępu I. PWE, Warszawa.
Rzeszutko, A. (2014). Efektywność produkcyjna rolnictwa w Polsce a relacje między czynnikami produkcji. Journal of Agribusiness and Rural Development, 2 (32), 141–154.
Tomczak, F., Wilkin, J. (2003). Rolnictwo polskie wobec integracji europejskiej: możliwości rozwojowe, bariery i strategie adaptacyjne. Krajowa Rada Spółdzielcza, Warszawa.

PRODUKTYWNOŚĆ PRACY I ZIEMI W ROLNICTWIE POLSKI NA TLE WYSOKO ROZWINIĘTYCH KRAJÓW UNII EUROPEJSKIEJ

Streszczenie. W artykule dokonano analizy porównawczej produktywność pracy i ziemi w Polsce i państwach UE najbardziej podobnych do Polski pod względem struktury produkcji rolniczej – w Niemczech, we Francji i w Danii. Zróżnicowanie produktywności ukazano w rozbiciu na grupy gospodarstw o różnej powierzchni użytków rolnych i sile ekonomicznej. Badanie przeprowadzone dla danych z 2013 roku pozwoliło zidentyfikować, że w Polsce małe i średnie gospodarstwa są wydajniejsze niż w porównywanych krajach UE-15, co jednak nie wpływa na większą wydajność całego sektora, gdyż o niej decydują wyniki ekonomiczne gospodarstw największych. Rozbicie gospodarstw na grupy według powierzchni użytków rolnych prowadzi do wniosków, że najlepiej czynnik pracy wykorzystują gospodarstwa małe i duże, czynnik ziemi zaś gospodarstwa posiadające średni areał.

Słowa kluczowe: struktury wytwórcze, rolnictwo, analiza porównawcza

Accepted for print: 04.10.2016

For citation: Czyżewski A., Staniszewski J. (2016). Land and labour productivity in Polish agriculture against highly-developed countrie of the European Union. Acta Sci. Pol., Oeconomia, 15 (4), 53–63.