Labour Productivity in Agribusiness in the European Union

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Introduction

Agribusiness, also known as the food economy or agri-food sector, is a subsystem of the national economy, which has developed its own internal connections and which is simultaneously strongly integrated with other sectors of the national economy. The dynamism of development of agribusiness considerably depends upon the character of internal proportions which develop between its individual components and upon relations with the other sectors of the national economy. One of detailed theories investigating the share and importance of individual sectors of the national economy in food production is the agribusiness theory, which was developed by J.H. Davis and R.A. Goldberg[1]. J.H. Davis first used the term 'agribusiness' on 17 October 1955 at the conference in Boston, where he made a speech on *Business Responsibility and Market for Farm Products*. In 1956 Davis published the article *From Agriculture to Agribusiness* in Harvard Business Review and in 1957 his famous book *A Concept of Agribusiness* was published, which includes the most advanced concept of agribusiness with scientific explanation. R.A. Goldberg was the co-author of the book. He developed statistical and mathematical problems, especially the input-output tablese, which showed the flow of goods and services between individual aggregates of agribusiness and different sectors of the national economy. It widely applied W. Leontief's input-output theory (Davis, Goldberg 1957).

J. H. Davis understood agribusiness as the total of all operations of agricultural production, including the production and distribution of the entire supply stream providing farms with means of production and production services, as well as all operations related with the turnover, storage, processing and distribution of agricultural products. According to the classic formula, agribusiness is part of the economic system which produces food and provides raw materials from the farm to consumers. Agribusiness as a national economy sector consists of three main economic aggregates (groups), which are used in this analysis. Sphere I includes the industries manufacturing means of production and services for

[1] The essential study on the theory of agribusiness, its internal structure and connections with the national economy is , *A Concept of Agribusiness* by Davis J.H and Goldberg R.A, Boston 1957. Polish translation: *Koncepcja agrobiznesu*, IER, Warsaw 1967.

agriculture and the food industry, sphere II - agriculture, sphere III - the food industry (Davis, Goldberg 1957).

At the current stage of the socioeconomic development in the European Union the significance of the entire agri-food sector (agribusiness) in the national economy is important in terms of the volume of the production potential, production and income output (Mrówczyńska-Kamińska 2013). The production potential of the food economy and the production capacity of this sector of the national economy are determined by the country's natural resources, its workforce and technical equipment. In the food economy all these factors are significant from the point of view of rationality and their influence on the production volume of raw materials and finished food products. However, labour resources are the only active and creative factor of production. The other factors play an accessory role, creating suitable conditions for a business activity and contributing to the making of a product (Baer-Nawrocka 2008). The analysis of labour resources in the food economy in terms of their internal structure, their share in the national economy and productivity is important from the point of view of research on the development of agriculture towards modern agribusiness (Polopolus 1986).

The main aim of the article is a comparative analysis of labour productivity in agribusiness in the European Union. The first part of the article presents the volume and internal structure of the workforce in three sphere of agribusiness (the industries manufacturing means of production and production services, agriculture and the food industry) and the share of agribusiness in the national economy. The second part analyses the level of labour productivity in agribusiness, with reference to the global production value and gross value added per employee and it measures the relations between labour productivity in agribusiness and the entire national economy and it also determines the internal competitiveness of the agri-food sector. The analysis concerns three sphere of agribusiness according to the scheme suggested by Davis and Goldberg (1957). The basic source materials used in this study were input-output tables for individual countries of the European Union and the data from Eurostat.

The volume and internal structure of the workforce, global production and gross value added in agribusiness in the European Union

The analysis of economic and social structures and the changes that take place in them are an important issue in the theory of economic development. The share and role of individual sectors of economy (industry, agriculture and services) in the economy of a particular country

are important elements of those structures (Fiedor, Kociszewski 2010). The analysis of the share and significance of individual sectors of the national economy in food production occupy an important position in the economic development of a country. The processes of quantitative changes and the accompanying structural changes in the workforce proceed in different ways in individual countries. They depend on the level of economic development, agrarian structure, socioeconomic policy and the degree of substitution of living labour with objectified labour (Wiatrak 1990). In different analyses concerning labour resources in the countries of e.g. the European Union, it is possible to observe a general regularity, which consists in the fact that the more economically developed a country is, the smaller the number of people directly employed in agriculture is and the higher the number of people employed in other non-agricultural sectors of the national economy is. Table 1 and Figure 1 show the internal structure of labour resources in the food economy and their share in the total employment in the EU countries.

As can be concluded from the data analysis, in highly socioeconomically developed countries[2] the structure of employment in the agri-food sector has modern relations, whereas in poorer countries the structure is not modern. Among the EU countries it is possible to distinguish those with a very high number of people employed in the food economy and with a non-modern agribusiness structure. In Poland and Romania there are 3 million people working in food production, nearly 80.0% of whom work in agriculture. The situation is similar in Bulgaria, Slovenia, Portugal, Greece and Slovakia, where in the internal agribusiness structure more than ¾ are the people employed in agriculture. On the other hand, in richer countries, mainly those of the former fifteen member states, the internal structure is dominated by the people employed in the food industry and in the first zone of agribusiness (e.g. Belgium, Sweden, the United Kingdom). Also in France, Germany and Spain, in spite of the fact that there are as many as 2 million people employed in the food economy, most of them work in the food industry and in the first zone of agribusiness. Thus, it is possible to state that the greatest problems with the employment structure in agribusiness can be observed in the countries which joined the European Union after 2004 and which have the lowest socioeconomic development level, measured with the GDP per capita. The problem of high employment in agriculture in those countries is one of the most difficult issues concerning agriculture itself and the entire food economy. In Poland this fact should chiefly be attributed to the socioeconomic structure of agriculture, which is dominated by fragmented peasant

[2] Measured with the GDP per capita; see (Mrówczyńska-Kamińska 2013).

economy. The high level of employment in agriculture is also forced by its low equipment with modern, workload-limiting technology (Czyżewski 1992). The problem of absence of appropriate technological equipment in peasant farming also causes low workload productivity in the agricultural sector.

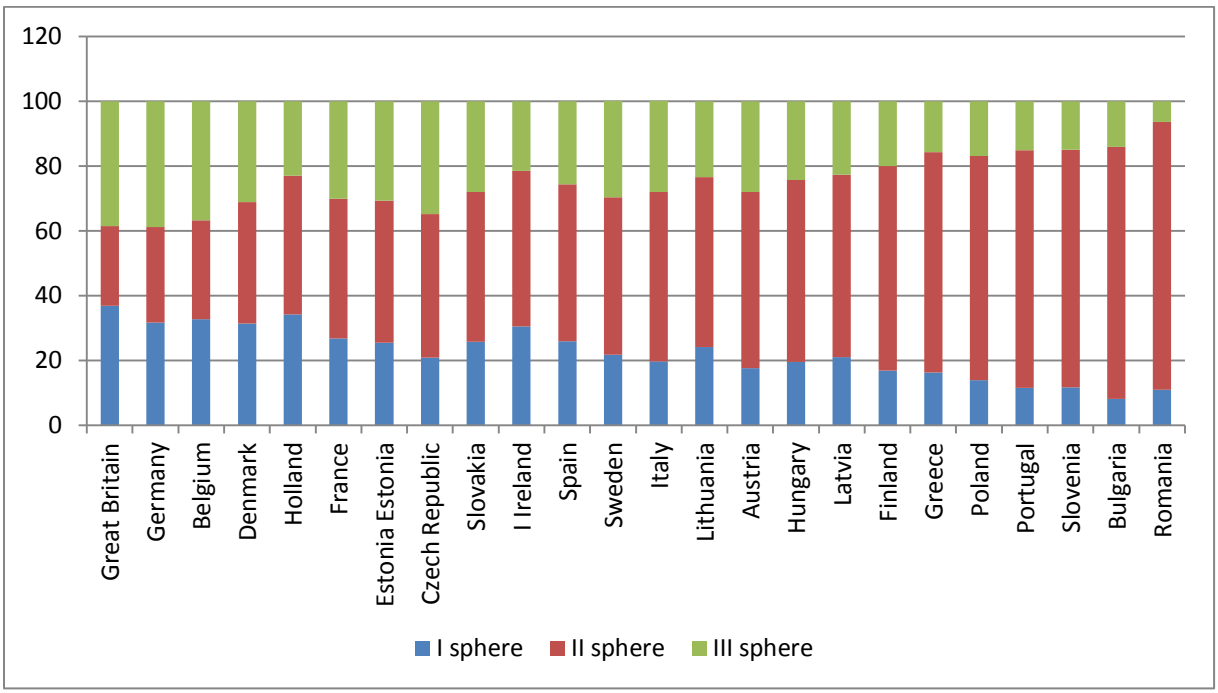
Table 1. Labour resources in agribusiness in the EU countries in 2009

Specification		2 009			
		I sphere	II sphere	III sphere	Total
Austria	Thousand people	46,4	143,6	74,3	264,3
	%	17,6	54,3	28,1	100,0
	Share of national economy	x	x	x	6,5
Belgium	Thousand people	83,9	78,3	94,2	256,4
	%	32,7	30,5	36,7	100,0
	Share of national economy	x	x	x	5,7
Bulgaria	Thousand people	74,1	710,4	128,6	913,1
	%	8,1	77,8	14,1	100,0
	Share of national economy	x	x	x	26,0
Czech Republic	Thousand people	87,1	184,0	145,3	416,4
	%	20,9	44,2	34,9	100,0
	Share of national economy	x	x	x	8,2
Denmark	Thousand people	63,3	76,0	63,0	202,3
	%	31,3	37,6	31,1	100,0
	Share of national economy	x	x	x	7,2
Estonia	Thousand people	13,5	23,3	16,3	53,1
	%	25,4	43,9	30,7	100,0
	Share of national economy	x	x	x	9,6
Finland	Thousand people	31,9	120,0	38,0	189,9
	%	16,8	63,2	20,0	100,0
	Share of national economy	x	x	x	7,6
France	Thousand people	496,3	799,4	557,3	1 853,0
	%	26,8	43,1	30,1	100,0
	Share of national economy	x	x	x	6,9
Greece	Thousand people	125,7	527,1	122,8	775,6
	%	16,2	68,0	15,8	100,0
	Share of national economy	x	x	x	16,4
Spain	Thousand people	429,7	806,7	428,1	1 664,5
	%	25,8	48,5	25,7	100,0
	Share of national economy		x	x	8,9
Holland	Thousand people	200,1	252,1	135,1	587,3
	%	34,1	42,9	23,0	100,0
	Share of national economy	x	x	x	6,8
Ireland	Thousand people	63,7	99,9	45,1	208,7
	%	30,5	47,9	21,6	100,0

	Share of national economy	x	x	x	11,3
Lithuania	Thousand people	53,3	116,3	51,9	221,5
	%	24,1	52,5	23,4	100,0
	Share of national economy	x	x	x	15,7
Latvia	Thousand people	32,5	87,0	35,1	154,6
	%	21,0	56,3	22,7	100,0
	Share of national economy	x	x	x	16,6
Germany	Thousand people	695,0	648,0	852,0	2 195,0
	%	31,7	29,5	38,8	100,0
	Share of national economy	x	x	x	5,4
Poland	Thousand people	444,3	2 202,1	539,4	3 185,8
	%	13,9	69,1	16,9	100,0
	Share of national economy	x	x	x	20,2
Portugal	Thousand people	86,1	550,0	113,3	749,4
	%	11,5	73,4	15,1	100,0
	Share of national economy	x	x	x	13,9
Romania	Thousand people	366,8	2 794,0	216,1	3 376,9
	%	10,9	82,7	6,4	100,0
	Share of national economy	x	x	x	36,8
Slovakia	Thousand people	43,8	78,9	47,8	170,5
	%	25,7	46,3	28,0	100,0
	Share of national economy	x	x	x	7,7
Slovenia	Thousand people	13,5	85,1	17,3	115,9
	%	11,6	73,4	14,9	100,0
	Share of national economy	x	x	x	11,8
Sweden	Thousand people	42,7	95,6	58,6	196,9
	%	21,7	48,6	29,8	100,0
	Share of national economy	x	x	x	4,4
Hungury	Thousand people	102,3	294,6	127,4	524,3
	%	19,5	56,2	24,3	100,0
	Share of national economy	x	x	x	13,0
Great Britian	Thousand people	422,0	282,1	442,0	1 146,1
	%	36,8	24,6	38,6	100,0
	Share of national economy	x	x	x	3,9
Italy	Thousand people	352,1	934,7	504,5	1 791,3
	%	19,7	52,2	28,2	100,0
	Share of national economy	x	x	x	7,3

Source: The author's calculations based on Input-output tables in the EU countries and Eurostat's data from the tab 'National accounts', date of access 15 July 2012

Fig. 1. The employment structure in the food economy in the EU countries in 2009



Source: The author's compilation based on Table 1.

The employment structure in the agri-food sector is very important, because it is decisive to the modernity of a country's economic structure. There is a well-known regularity, which consists in the fact that the falling share of employment in agriculture in relation to the entire national economy is accompanied by the increasing share of employment in the production and trade sectors providing services for agriculture, in the food industry and in the entire services sector, i.e. in the first and third zones of employment. The data presented in Table 1 confirm these correlations in individual countries of the European Union. In the countries with a low share of employment in agriculture in relation to the entire national economy there is a significant share of employment in the sectors generating means of production for agriculture and the food industry and in the sector of services. Structural changes are a dominant phenomenon. The most significant of them include: lower share of direct employment, i.e. in agriculture (from 1995 to 2009 the rate of decrease in employment was 0.77%) (Table 2), higher share of employment in industrial sectors (from 1995 to 2009 the rate of increase in employment in the food industry was 1.02%, whereas in the industries providing services for agriculture and the food industry it was 1.16%). In spite of the increase in employment in the first and third zone of the food economy in the European Union there is still a considerable number of people employed in agriculture itself. In all of the EU countries under analysis in 1995 the share was 0.55 per person employed in agriculture, whereas in

2009 it was 0.77. In the new member states in 1995 the index was 0.22 people employed in the first and third zone of the food economy, whereas in 2009 it was 0.39. On the other hand, in the former EU-15 countries in 1995 there were 0.96 people working in other sectors of the food economy per one person employed in agriculture, whereas in 2009 the index was as high as 1.23 (Table 2). As results from a detailed analysis, in 2009 in Poland there were 0.5 people employed in other sectors of the food economy per one person employed in agriculture, in Romania – 0.25, in Bulgaria – 0.30, whereas in Germany the index was as high as 2.4[3].

Table 2. The number of people employed in the first and third sphere of the food economy per one person employed in agriculture in the EU countries in 1995 and 2009

Specification	1995	2009
European Union - 27	0,54	0,77
European Union - 15	0,96	1,23
European Union - 12	0,22	0,39

Source: The author's compilation based on Table 1.

To sum up, we can say that in spite of the changes which have taken place in individual EU countries since 1995 and which have resulted in the development of the zone providing services for agriculture and the food industry, the structure of agribusiness in Central and Eastern European countries is not modern yet. This is the cause of weakness of the food economy in Central and Eastern Europe. The increase in employment in the industries providing services for agriculture and the food industry seems to be the most significant element in the evolution of employment structure in the development of agriculture towards agribusiness.

The share of employment in agribusiness in total employment in the national economy

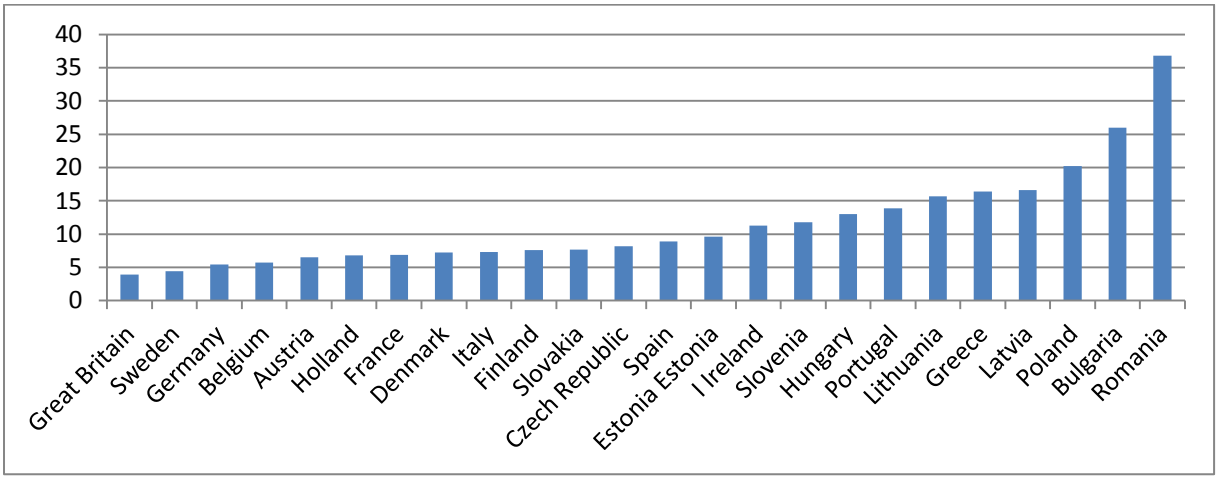
As early as 1957 Davis and Goldberg (1957) pointed to the fact that the increasing employment in the procurement sector and in the food industry combined with the decreasing employment in agriculture is a specific trait of the technological revolution, which should take place in the social process of food production. The revolution is related with the increasing stream of means of industrial origin flowing to agriculture and with the handling of exchange

[3] In the United States, where the development of food economy is the most advanced in the world, as early as 1975 the relation was about 1.75 (Woś 1979).

relations. Studies on the material flow in agribusiness in the countries of the European Union give grounds for the conclusion that the new member states of the European Union have not undergone a technological revolution in the social process of food production yet, although the first symptoms of changes in this aspect are noticeable (Mrówczyńska-Kamińska 2010). The share of employment in agribusiness in total employment is a significant index reflecting the level of economic development in a particular country. High employment in agriculture is strictly related with the level of development, or rather underdevelopment. The employment in non-agricultural sectors rises along with the economic growth, which enables absorption of excessive labour resources from agriculture. In consequence of specialisation, modernisation and technological progress reduced employment in agriculture is a necessary and unquestionable tendency (Bański, 2007; Tomczak 2005). The process of reduction of employment in agriculture is taking place at different rates in individual member states of the European Union. It is a result of disproportion in the level of socioeconomic development in a particular country, the applied socioeconomic policy, the agrarian structure, the access of agriculture to means of production and the possibility to replace living labour with objectified labour (Poczta, Kołodziejczak, 2004). Employment is one of the basic indexes determining the volume of labour which a community uses to produce food. In individual countries of the European Union there are different shares of employment in the food economy in relation to the total national economy (Table 1, Fig. 2). In the last year under study the entire European Union directly and indirectly spent 9.6% of the total labour resources it had at its disposal. In the EU-15 the process of decreasing employment in agriculture and increasing employment in non-agricultural sectors led to the situation where employment in the total food economy is about 5-7.0% of total employment in the national economy. This situation can be observed in such countries as: the United Kingdom, Sweden, Germany, Belgium, Austria, Holland, France, Denmark and Italy. In most of those countries the share of employment in the sector producing agricultural raw materials and finished food products remained at a low level during the entire period under investigation. On the other hand, in less developed countries, where agriculture is still one of the most important sectors of the national economy, the share remains at a considerable level, e.g. Romania (35.0%), Bulgaria (26.0%), Poland (20.0%), Latvia, Greece and Lithuania (about 15.0%). Altogether those countries concentrate more than 50.0% of the total number of people employed in agriculture in the Community (over 6.5 million people). These results point to the fact that on average every fifth employee in those countries is related (directly or indirectly) with food production. It is a very high rate and it means that 1/5 of the total potential of living labour is used to satisfy society's most basic

need. Tomczak (2001) wrote *'The country cannot be highly developed if a large part of its potential and resources is used for food production'*. The diversion of resources (mainly labour) from agriculture to the sectors with higher workforce productivity, industry or services is a sine qua non for higher economic growth of a country (Fereniec 1999; Tomczak 1985; 2004; Poczta, Mrówczyńska-Kamińska 2004).

Fig. 2 The share of employment in the agri-food economy in the total employment in the national economy in the EU countries in 2009



Source: The author's compilation based on the data from Table 1.

Labour productivity in the agri-food economy in the European Union

In research on the development of agriculture towards agribusiness it is an important aspect to determine the effectiveness of use of the factors of production (Woś 1979, Tomczak 2004). Labour and productivity, which results from it, are some of the more significant factors. In the countries which have been the members of the European Union since 2004, including Poland, there is a problem of very low workforce productivity in agriculture and in the entire agri-food sector (Baer-Nawrocka, Kiryluk-Dryjska 2009; Czekaj 2008; Poczta, Mrówczyńska-Kamińska. 2008; Stępień, Poczta-Wajda, Czyżewski 2006). Research on labour productivity is an important issue due to the fact that the effective use of the factors of production is decisive to the competitiveness of agriculture and the entire agri-food sector on a national and international scale. Along with the socioeconomic system and the economic policy the volume, quality and structure of production resources and the effectiveness of their use are the most important factors determining the competitiveness of a particular economy and its

sectors (Misala, Ślusarczyk 1999). Labour productivity is the most important measure of productivity, which above all results from the essence of management and economic growth, the sense of which boils down to the production of increasing amounts of goods and income per employee. This is only possible with the growth of labour productivity (Poczta, 1994; 2003).

The analysis of labour productivity in agribusiness in the EU countries was made on the basis of the volume of global production and gross value added[4]. The research showed that the food economy in the EU-15 has the highest labour productivity, measured with global production. In such countries as Belgium, Holland, Ireland, Sweden and Denmark in 2009 labour productivity reached 160-180.0 billion euros per employee, whereas in Germany, France and the United Kingdom it was about 140.0 thousand euros. These are chiefly highly developed countries, where the level of development of the food economy is the highest in the entire European Union. In those countries there are modern correlations in input-output in agribusiness (Mrówczyńska-Kamińska 2010). On the other hand, the lowest labour productivity can be observed in the countries of Central and Eastern Europe, where one person employed in the entire food economy generates from about 11.0 thousand euros of global production in Bulgaria and Romania to about 25.0 thousand euros in Poland, Latvia and Lithuania. In 2009 the mean level of labour productivity in the entire European Union reached about 90.0 thousand euros, but in the EU-15 the productivity amounted to 117.0 thousand euros on average, whereas in the new member states it was slightly less than 35.0 thousand euros. Above all, it was the level of productivity in the food industry that caused considerable differences in the level of labour productivity in the food economy in individual countries. In 2009 in Ireland and Holland one person employed in the food industry generated more than 420 thousand euros of global production, whereas e.g. in Bulgaria this level was more than 20 times lower (24.0 thousand euros). Similar differences can be observed in

[4] The author made a detailed analysis of the internal structure in agribusiness in terms of global production and gross value added as well as the share in the national economies in the countries of the European Union (Mrówczyńska-Kamińska 2012 and 2013). The comparison of the importance of agribusiness in individual EU countries in terms of their production and income output indicates that in less socioeconomically developed countries agribusiness is at an early stage of its way to modernity. In the countries which joined the European Union after 2004, including Poland, the structure of agribusiness is dominated by the sectors of direct food production, i.e. agriculture and the food industry. On the other hand, in the other more economically developed countries it is the food industry and the first zone (the industries manufacturing means of production and providing services for agriculture and the food industry) that play the main role in the generation of global production and gross value added in agribusiness. Although in the years under study some changes in the share of agribusiness in the national economy and its internal structure could be observed in poorer countries, those changes were very slow. The situation in those countries is still rather traditional and it is undergoing relatively small transformations.

laboure productivity in agriculture. For example, in Denmark, France, Holland, Germany and Sweden one employee generated more than 100.0 thousand euros of production, whereas in Bulgaria, Romania and Poland it was more than 10.0 times less. These results point to the fact that in comparison with the EU-15 the differences in the level of labour productivity in the new member states are huge, which is chiefly caused by the level of labour productivity in agriculture[5].

Table 3. Labour productivity in agribusiness in the European Union in 2009 (thousand euros; %)

Specification	Global productivity per 1 employee (thousands of euro)				Gross value adedd per 1 employee (thousands of euro)			
	I sphere	II sphere	III sphere	Total	I sphere	II sphere	III sphere	Total
Austria	138,3	59,8	229,1	121,2	59,5	26,3	77,1	46,4
Belgium	136,0	82,9	307,1	182,6	58,4	25,5	65,6	51,0
Bulgaria	27,4	6,1	24,3	10,4	14,3	2,4	4,7	3,7
Czech Republic	43,5	39,2	86,7	56,7	10,4	15,1	24,4	17,4
Denmark	131,8	114,4	273,2	169,3	47,1	20,1	72,0	44,7
Estonia	44,9	34,9	75,1	49,8	16,7	12,0	16,3	14,5
Finland	137,0	65,4	274,4	119,2	47,2	32,9	69,3	42,6
France	120,7	105,5	241,0	150,3	38,3	36,2	46,1	39,7
Greece	57,9	20,4	148,7	46,8	12,9	11,4	60,3	19,4
Spain	85,3	55,1	218,4	104,9	28,1	30,1	49,0	34,5
Holland	105,3	101,9	421,4	176,5	43,7	34,3	110,2	55,0
Ireland	145,8	64,8	434,8	169,5	44,8	13,0	133,7	48,8
Lithuania	28,7	18,9	60,4	31,0	12,8	6,7	18,3	10,9
Latvia	10,6	17,6	48,2	23,1	2,3	6,1	11,2	6,5
Germany	101,0	82,6	191,4	130,7	32,8	26,4	42,5	34,7
Poland	33,9	11,0	60,1	22,5	9,3	4,5	13,5	6,7

[5] For example, in 2010 in Polish agriculture labour productivity measured with the production generated reached 30.0% of the average level in the EU-27 and only 17.6% of labour productivity in the agriculture of the EU-15. In other words, it was three and six times lower, respectively. Only Romanian, Bulgarian and Latvian agriculture has lower labour productivity than in Poland. In general, the productivity of factors of production in Polish agriculture is low, as compared with the other EU countries. Mainly due to the lower intensity of production (low capital outlay) and lower intensity of organisation of agricultural production (a high share of cereals in the crops structure and a relatively low number of farm animals) the productivity of land in Polish agriculture is noticeably lower than the productivity in the EU-27 (by 34.0%) and in the EU-15 (by 43.0%). The productivity of land is lower in the Baltic countries, Bulgaria, Romania, the Czech Republic and Slovakia. On the other hand, the productivity of capital outlay measured with the production volume is slightly higher than the average level in the entire European Union. However, this index should be evaluated only as moderately positive, because the level of outlay per 1 ha of farmland in Polish agriculture is noticeably lower than in the entire European Union. Thus, according to the rule of decreasing marginal effectiveness of outlay its productivity in Polish agriculture should be noticeably higher than the EU average. To sum up, we can say that in Polish agriculture the productivity level of factors of production, especially those the resources or outlay of which are expressed in natural units (ha of farmland or AWU), i.e. when there is no favourable effect of lower prices in Poland, proves the fact that productivity is not a strong point of the agricultural sector in Poland and it needs to be compensated with the lower payment level of the factors of production involved (Poczta 2012).

Portugal	55,6	13,3	119,5	34,2	16,1	5,8	24,5	9,8
Romania	17,1	5,7	92,2	12,4	6,3	2,7	34,4	5,1
Slovakia	46,8	55,8	73,8	58,5	20,5	28,5	21,3	24,4
Slovenia	61,2	18,2	103,2	35,9	25,5	8,8	29,5	13,9
Sweden	144,4	99,6	259,4	156,9	61,5	46,3	58,9	53,4
Hungary	50,3	24,5	65,6	39,5	20,1	8,8	13,6	12,2
Great Britain	75,1	106,9	213,3	136,2	25,4	51,3	74,5	50,7
Italy	112,8	48,7	230,6	112,5	37,3	25,5	51,0	35,0

Source: The author's calculations based on Input-output tables for individual countries of the European Union and the Eurostat's data.

The research on labour productivity in the food economy measured with gross value added per employee reveals very similar correlations. There is high productivity in the food economy in the countries of Western and Northern Europe, whereas the productivity is very low in Bulgaria, Romania, Poland, Latvia and Lithuania. The differences are chiefly influenced by high labour productivity in the food industry, e.g. in Ireland, Holland, Denmark, Belgium, Sweden or in the United Kingdom and by relatively low labour productivity in agriculture in the new member states of the European Union. The fact that in comparison with labour productivity in the former EU-15 differences between labour productivity in agriculture in the new member states are smaller and smaller is a positive symptom (Floriańczyk 2006, Baer-Nawrocka, Markiewicz 2012).

Labour productivity in the food economy in the European Union compared with the labour productivity in the entire national economy

In economic analyses it is important to take into account both absolute labour productivity (the ratio between global production or gross value added and the number of employees) and relative labour productivity (the ratio between productivity in a particular sector (branch) and the same measure in the entire national economy). Programmes of development of the agri-food sector stress the fact that as soon as possible agriculture and the food economy should achieve the highest possible competitive capacity in relations with foreign partners. However, internal competitiveness is a condition of effective external competitiveness. According to Woś (2000), the internal competitiveness of the agri-food sector can be defined as its economic position in relation to other sectors of the national economy, i.e. as the input-output of value added and its balance. Simultaneously, it is the measure of the capacity of agriculture and the entire food economy to self-finance its development. Relative labour productivity depends on the level of absolute labour productivity in individual sectors (branches) of the

national economy and on the sectoral structure of employment, i.e. on the share of a particular sector (branch) in total employment. Relative labour productivity is significantly influenced by structural changes in the national economy. High employment in the agri-food sector chiefly resulting from high employment in agriculture will be the most important cause of low labour productivity in agribusiness, as compared with the other non-agricultural sectors (Woś, Zegar 1983).

When analysing the data concerning relative labour productivity in the food economy and comparing them with the entire national economy in the European Union (Table 4) it is possible to notice the fact that in the countries with a relatively low share of employment in agriculture and the food economy, as compared with the entire national economy (Fig. 2), the level of labour productivity in the entire agri-food sector is similar to the average labour productivity in the entire national economy. For example, in the United Kingdom, Holland, Slovakia and Sweden labour productivity in the food economy was more than 90.0% of average labour productivity in the national economy. On the other hand, the lowest labour productivity in the food economy, as compared with the entire national economy, could be observed in Portugal, Poland, Latvia, Bulgaria, Slovenia, Romania and Greece, i.e. mainly in the countries where the share of employment in agriculture achieved the highest percentage in the total employment in the European Union. Labour productivity in the food economy in those countries was more than 50.0% lower than the average productivity in the national economy. In the other countries of the European Union one person employed in the food economy produced about 40.0% less than one person employed in the national economy. These results point to the fact that in most countries of the European Union the entire food economy belongs to the sectors of the national economy which have difficulties achieving comparable labour productivity. However, in more socioeconomically developed countries the food economy is much more internally competitive than in poorer countries. This situation is chiefly caused by the fact that those countries have already undergone deep structural changes both in the entire national economy and in the agri-food sector itself. The structure of food production is dominated by industrial sectors of the national economy, which usually have higher labour productivity than agriculture. On the other hand, in less economically developed countries agriculture has a significant share in the internal structure of agribusiness, both in its productive potential and in the production and income output (Mrówczyńska-Kamińska 2013).

Table 4. The correlation between labour productivity in agribusiness and labour productivity in the entire national economy in the European Union in 2009 (%)

Specification	Austria	Belgium	Bulgaria	Czech Republic	Denmark	Estonia Estonia	Finland	France	Greece	Spain	Holland	I Ireland	Lithuania	Latvia	Germany	Poland	Portugal	Romania	Slovakia	Slovenia	Sweden	Hungary	Great Britain	Italy
I sphere	93,5	82,5	161,5	39	65,4	73,6	75,3	58,9	30,5	54,9	71,8	58,7	73,3	13,3	59,5	47,3	53,4	51,6	74,4	79,3	90,8	98,7	48,3	66,1
II sphere	41,3	36	27,1	56,7	27,9	52,9	52,5	55,6	27	58,8	56,3	17	38,4	35,3	47,9	22,9	19,2	22,1	103,5	27,4	68,4	43,2	97,6	45,2
III sphere	121,1	92,7	53,1	91,6	100	71,9	110,5	70,9	142,6	95,8	181	175,1	104,8	64,8	77,1	68,6	81,3	281,9	77,3	91,8	87	66,8	141,8	90,4
Total	72,9	72,1	41,8	65,3	62,1	63,9	67,9	61	45,9	67,4	90,3	63,9	62,4	37,6	62,9	34,1	32,5	41,8	88,6	43,2	78,9	59,9	96,5	62

Source: The author's calculations based on Input-output tables in the EU countries and the data from the tab 'National accounts' www.epp.eurostat.ec.europa.eu

Detailed analysis of relations in labour productivity in individual sphere of the food economy reveals the fact that in Holland, Ireland, the United Kingdom and Greece labour productivity in the food industry was higher than the average labour productivity in the national economy. In the first two countries it was nearly 80.0% higher, whereas in the other two it was about 50.0% higher. These results point to the fact that the food industry in those countries is capable of financing its development. It is necessary to take into account the situation in Romania in terms of labour productivity in the food industry as compared with the entire national economy. Productivity in the third sphere of agribusiness is much higher than the average in the national economy (nearly 200.0%). However, this measure should not be interpreted as a sign of extraordinary results in the Romanian food industry. This situation is mainly caused by the fact that apart from the prosperous food industry Romania does not have any other sector of the national economy which could be the driving force of its development. The situation in Bulgaria looks similar, but the potential labour productivity in the first sphere of agribusiness is higher than in the entire national economy.

Finally, one more aspect is noteworthy. In the countries of Western and Northern Europe, where the level of labour productivity in agribusiness is high, there is high significance of international exchange in the generation and distribution of the supply of products from agriculture and the food industry (Mrówczyńska-Kamińska 2009). On the other hand, in the new member states of the European Union both import and export are of low importance in this account. These results prove the low external competitiveness of agribusiness in the countries of Central and Eastern Europe.

Summary

To sum up the considerations concerning labour productivity in the food economy in the European Union, it is necessary to indicate that the new member states, including Poland, need a rapid increase in this productivity. These changes should mainly apply to the second zone of the food economy (agriculture). However, they will only be possible if employment is reduced. High employment in agriculture in the countries of Central and Eastern Europe has a structural character, which resulted from the long period of development of economic, social and demographic processes. The comparison with the countries of Western and Northern Europe revealed the fact that the increasing labour productivity is the result and sine qua non for the development of the entire national economy. It is a factor that enables the flow of enormous labour resources from agriculture to other branches of economy and thus it influences the development of industrial production and services. An increase in labour productivity will not only mean the higher potential of agriculture and food economy to increase the supply of food in domestic and foreign markets but it will also mean that the demand for these products will change. Along with the increase in real income a larger and larger part of income will be spent on non-agricultural products and services. The increasing labour productivity in agriculture will also contribute to a more and more intensive process of social division of labour both in agriculture and the entire food economy, so it will be one of the most important conditions for the development of agriculture towards agribusiness. Higher labour productivity in the entire agribusiness will also contribute to higher internal competitiveness, i.e. to the comparable productivity in agribusiness in relation to the entire national economy, and to higher competitiveness between the EU countries in international exchange.

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