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## **Agribusiness output and income results in the EU countries**

**Abstract.** The objective of the research is to compare the importance of agribusiness in the economies of the EU countries. The results suggest that the agribusiness share in national economy and its internal structure depends on the country's level of economic development. In the better developed countries the share index value is low, while in the less developed countries it is relatively high. The main condition for changing the situation in Poland is to generate an economic growth.

**Key words:** agribusiness, global production, gross value added, internal structure, agri-business share in the national economy in the EU.

### **Introduction**

The development paths of agribusiness tend to be similar worldwide. The number of farms as well as the percentage of employed in agriculture diminish, the workforce productivity grows, while the importance of agriculture and the whole agribusiness for the global production decreases. Moreover, the internal structure of agribusiness evolves: the share of agriculture goes down, while the importance of agri-food industry and services increases [Czyżewski 2001]. There are some differences concerning the stage and the pace of agribusiness development among the EU countries. Kolarska-Bobińska et al. [2001], Wilkin [2001], Tomczak [1985; 2000] and Tracy [1997] state that Poland and some other countries which joined the EU in 2004 are several years behind compared to the best developed countries of the EU.

The objective of this research is to compare the importance of agribusiness in the economies of the EU countries. First, we analyze relations between spheres of agribusiness. Next, we concentrate on the internal agribusiness structure, considering output and income results and the share of agribusiness in global economies.

### **Method**

The importance of agribusiness in economies of the EU countries is measured by their global production and gross value added. Moreover, the gross value added is used in this article in order to measure the income results of agribusiness. The gross value added index

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enables us to compare income results of farms with different ownership structure of production measures, and agri-food industry plants of different scale of production.

The analysis is based on the most recent data available from input and output matrixes<sup>3</sup>. The research comprises three spheres of agribusiness: the industry of means of production and services for agriculture and agri-food sector (sphere I), agriculture (sphere II), and agri-food industry (sphere III)<sup>4</sup>. Comparative statistics based on input-output data are used as a research method in the article.

### **Global production, intermediate consumption and gross value added in agriculture and agri-food industry**

The material inputs from the first, second and third spheres of agribusiness to agriculture and agri-food industry constitute intermediate consumption<sup>5</sup> in these sectors. Table 1 presents relations between agribusiness spheres in the EU countries. Due to the highest among the EU member states global production, the largest intermediate consumption in agriculture is observed in France (40 EUR billion in 2007). A relatively high intermediate consumption in agriculture takes place in Germany and Italy (18-26 EUR billion) as well as Spain, Holland, Great Britain and Poland (10-17 EUR billion). As a result of a relatively low importance of agriculture in national economies, the lowest level of intermediate consumption occurs in Lithuania, Slovenia and Estonia (700-300 EUR million).

An analysis of the structure of intermediate consumption (structure of inputs from different spheres of agribusiness) constitutes an important part of this research. The EU countries differ significantly in terms of the structure of intermediate consumption. In better developed countries the importance of the first sphere of agribusiness in material supply of agriculture predominates, while the importance of internal turnover in agriculture is marginalized. In Germany and Belgium, the share of internal turnover in agriculture is the smallest among the EU countries and reaches 5 and 8%. The highest importance of first sphere in material supply of agriculture takes place in Germany. In 2007, 80% of all inputs in German agriculture (20 EUR billion) came from the first sphere. In Belgium, the highest share of inputs to agriculture comes from the third sphere. It is mainly a result of a very well developed fodder and utilization industry.

In Romania, Bulgaria and Lithuania, the internal turnover in agriculture is high and reaches more than 50% of total inputs (70%, 63% and 46% respectively). The share of the first and the third sphere in the material supply of agriculture in these countries is relatively low. Thus, these countries are characterized by a low level of agribusiness development.

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<sup>3</sup> For the most of the EU countries the most recent data are available for 2005. Some countries like the Czech Republic, Denmark, Finland, France, Holland and Germany have published data for 2007, in case of the United Kingdom the most recent available input-output data come from 1995. Data for Romania and Bulgaria come from supply and use tables (2005) [Input... 2011]. The difference between the input-output and the supply and use methodologies was presented by Mrówczyńska-Kamińska [2010].

<sup>4</sup> A landmark contribution in the field of agribusiness research, describing its internal structure and linkage with global economy was done by Davis and Goldberg [1957] in a book entitled *A Concept of Agribusiness*. These authors define three main spheres of agribusiness used in this research.

<sup>5</sup> The value of products and services used as resources in production process: materials, raw materials, fuel and energy, external services and other costs.

Table 1. Global production, intermediate consumption and gross value added in agriculture of the EU countries <sup>a)</sup>, current prices, EUR million

Country	Intermediate consumption			Total intermediate consumption	Product taxes minus subsidies	Total intermediate consumption in purchase prices	Global production	Gross value added
	from I sphere	from II sphere	from III sphere					
Austria	1310	1058	383	2752	58	2810	4738	1927
Belgium	2261	284	1188	3733	396	4129	6186	2057
Bulgaria <sup>b)</sup>	612	1 260	149	2021	-	2 021	1 845	3 866
Czech Republic	1790	708	563	3061	94	3155	5188	2032
Denmark	3474	1112	1817	6403	180	6583	8402	1820
Estonia	128	94	55	276	6	282	490	204
Finland	1351	1183	534	3068	68	3136	4677	1539
France	21156	11666	5074	37896	349	38245	66254	28007
Germany	20859	1213	4443	26515	1190	27705	44749	17044
United Kingdom	7819	3960	3115	14894	331	15225	28007	12782
Greece	2451	1712	290	4453	50	4503	11927	7423
Holland	7803	4482	3564	15849	270	16119	26412	10293
Hungary	2092	1171	883	4145	88	4233	7336	3102
Ireland	1804	1444	877	4126	-118	4008	6418	2408
Italy	8419	5308	4167	17894	441	18335	44727	26393
Lithuania	374	389	87	850	-24	826	1686	858
Poland	4670	4041	1751	10462	554	11016	20049	9031
Portugal	1329	787	887	3004	194	3198	5645	2447
Romania <sup>b)</sup>	1 804	5 127	470	7 401	-	7401	8 264	15 665
Slovakia	851	600	226	1677	101	1778	3040	1259
Slovenia	281	230	47	559	11	570	1125	555
Spain	7880	2297	5961	16137	-662	15475	36909	21433
Sweden	1560	591	435	2576	204	2780	4096	1313

<sup>a)</sup> For the most of the EU countries the recent data are available for 2005. Some countries like the Czech Republic, Denmark, Finland, France, Holland and Germany have published data for 2007, in case of the United Kingdom the most recent available input-output data come from 1995.

<sup>b)</sup> Data for Romania and Bulgaria come from Supply and Use tables (2005). In Supply and Use tables the intermediate consumption was presented in purchase prices, thus the position 'income from products minus subsidies' is not included [Manual... 2008].

Source: own calculations based on input-output matrix [Input... 2011].

Moreover, the low importance of the third sphere indicates that the use of industrial fodders in agricultural production is low. These countries are at the lowest stage of agribusiness development path among all the EU countries. A relatively high share of internal turnover in agriculture (more than 40%) is also observed in Greece, Poland and

Slovenia. However, in Greece and Slovenia the first sphere remains important, while in Poland the third one. Greece, Poland and Slovenia are currently at the stage of changing the agribusiness structure into a better developed one.

Table 2. Global production, intermediate consumption and gross value added in the agri-food industry of EU countries<sup>a)</sup>, current prices, EUR million

Country	Intermediate consumption			Total intermediate consumption	Product taxes minus subsidies	Total intermediate consumption in purchase prices	Global production	Gross value added
	from I sphere	from II sphere	from III sphere					
Austria	4835	2634	2374	9843	27	9870	14389	4513
Belgium	10397	4896	6419	21712	55	21767	27885	6116
Bulgaria <sup>b)</sup>	627	819	540	1 986	-	1986	2 549	563
Czech Republic	3002	2757	3911	9669	2	9671	12206	2533
Denmark	5245	5469	3562	14276	222	14498	18640	4139
Estonia	369	298	169	836	-11	825	1030	202
Finland	3056	2424	2064	7544	-348	7196	9637	2439
France	49658	33418	21731	104806	-1632	103174	137296	33806
Germany	53496	32579	26713	112788	2247	115035	148775	33740
United Kingdom	20753	16029	14502	51284	-906	50378	71421	21041
Greece	5441	4171	1197	10809	-55	10754	15483	4727
Holland	15033	13500	13816	42349	278	42627	55739	13112
Hungary	3207	2544	1012	6763	-151	6612	8553	1939
Ireland	6850	4112	1884	12846	-401	12445	16840	4392
Italy	37956	25625	20922	84503	-39	84464	106641	23704
Lithuania	994	404	295	1692	-134	1558	2116	556
Poland	11346	8060	7123	26529	146	26675	33156	6480
Portugal	3640	3833	2586	10059	-173	9886	13139	3249
Romania <sup>b)</sup>	1 749	2 777	3 279	7 805	-	7805	11 993	4 188
Slovakia	1236	844	706	2785	0	2785	3678	890
Slovenia	591	274	479	1345	-9	1336	1800	464
Spain	30566	22965	20295	73826	-2565	71261	88874	17612
Sweden	4373	2587	2675	9635	-47	9588	13386	3759

<sup>a)</sup> For the most of the EU countries the recent data are available for 2005. Some countries like the Czech Republic, Denmark, Finland, France, Holland and Germany have published data for 2007, in case of the United Kingdom the most recent available input-output data come from 1995.

<sup>b)</sup> Data for Romania and Bulgaria come from Supply and Use tables (2005). In Supply and Use tables the intermediate consumption was presented in purchase prices, thus the position 'income from products minus subsidies' is not included [Manual... 2008].

Source: own calculations based on input-output matrix [Input... 2011].

The global production of agriculture is determined by inputs from all spheres of national economy. The highest global production is reached in France (more than 66 EUR billion in 2007), Italy and Germany (about 45 EUR billion) and Spain (37 EUR billion). The total production of these countries constitutes more than 55% of the total global production in the EU, while the gross value added in these countries reaches 60% of the EU total. A relatively high global production is observed in the United Kingdom, Holland and Poland (28 and 20 EUR billion respectively).

All material inputs form the first, second and the third sphere of agribusiness constitute an intermediate consumption in the agri-food industry (Table 2). The highest intermediate consumption in the third sphere of agribusiness was observed in Germany and France (more than 100 EUR billion). In Italy, Spain and the United Kingdom it reached a level of 50-85 EUR billion. The total intermediate consumption of these countries reached 70% of the total EU agri-food industry. The highest share of agri-food industry in the total EU output and income results was produced in Germany, France, Italy, Spain and the United Kingdom, the lowest in Slovakia, Bulgaria, Lithuania, Slovenia and Estonia. In Poland, the intermediate consumption and output and income results of the third sphere constitute 3-4% of the EU total.

The tendencies in the structure of inputs to agri-food industry are ambiguous. They depend on the importance of agri-food industry in the overall economy of particular countries. The highest importance of the first sphere in the material supply of agri-food industry refers to Ireland (55% of total inputs from the first to the third sphere in 2005). In Lithuania, the United Kingdom, Austria, Sweden and Germany inputs from the first to the third sphere constitute more than 40% of the total.

The agri-food industry is the main recipient of agricultural products. In most of the countries, about 30-40% of all inputs to agri-food industry come from agriculture. Latvia with only a 24% share is an exception. The lowest importance of internal turnover in agri-food industry takes place in Ireland and Hungary (15%), and the highest in Romania (about 40% all inputs to the third sphere).

### **Agribusiness's output and income results; volume, structure and share in the national economy**

Basing on the data presented in the previous section of this article, we analyze the internal structure of agribusiness by output and income results and we present the agribusiness share of national economy. In most of the EU countries the biggest part of global production in agribusiness comes from the agri-food industry (Figure 1). Bulgaria and Romania are exceptions, where agriculture dominates in the global agribusiness production structure (60-80%). More than 40% share of agriculture in the global production of agribusiness is observed in Greece, Lithuania, Slovakia and Hungary. In contrast, the lowest importance of agriculture in its internal structure appears in Belgium, Germany and Sweden (respectively 18 and 23%). The results confirm that these countries are situated at a high stage of agri-business development path.

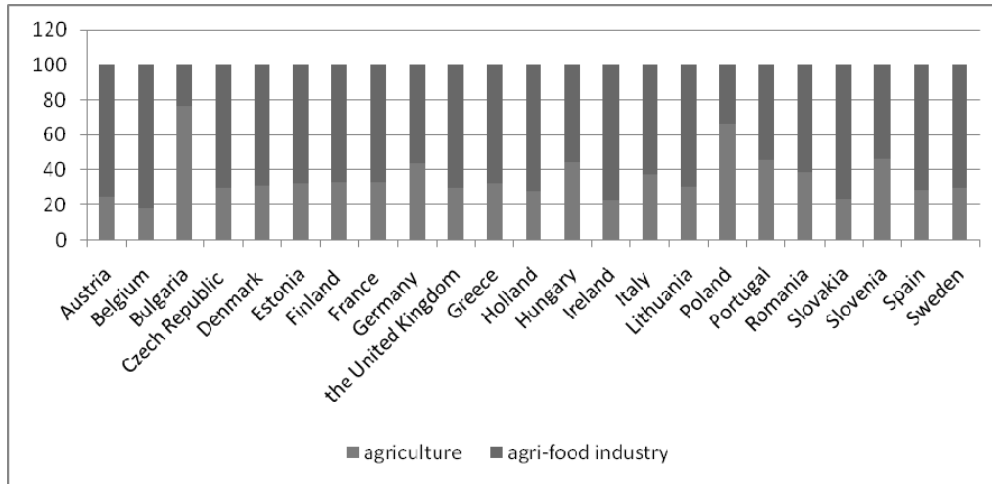


Fig. 1. Internal structure of global production in the EU agribusiness, %

Source: own elaboration based on data from Tables 1 and 2.

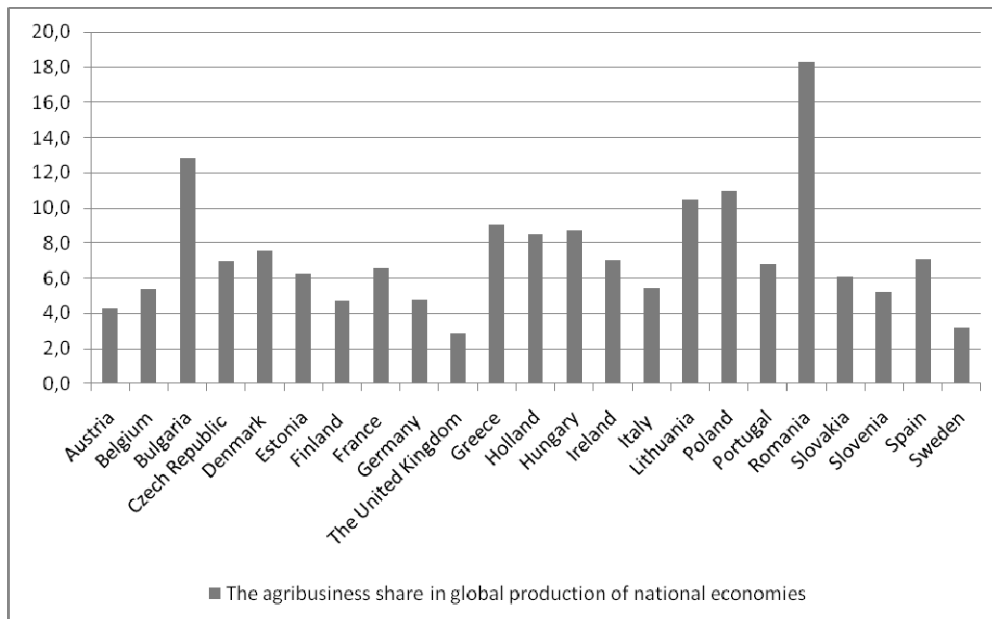


Fig. 2. The agribusiness share in the global production of national economies in the EU countries, %

Source: own elaboration based on the data from Tables 1, 2 and the Eurostat [Economic... 2011].

The importance of agribusiness can be measured by its share in the global production of national economy. This index is diversified among the EU countries. It is the highest in Romania (about 18%) and Bulgaria (about 13%), it reaches about 10% in Poland and Latvia, while the lowest index value occurs in Sweden and Great Britain (3%), Austria and Germany (4%) (Figure 2). These results suggest that the share of agri-business in the

national economy depends on the level of economic development of the EU countries. In better developed countries the index value is low, while in less developed relatively high.

In the internal structure of agribusiness measured by gross value added, agriculture predominates in the most of EU member states. The highest share of agriculture occurs in Belgium, Sweden and Austria (more than 70%), the lowest in Greece, Lithuania and Hungary. Unambiguous explanation of this phenomenon proves to be difficult. The income results in different parts of agribusiness are not always in line with general development patterns of the whole sector. In Germany, for example, the agribusiness structure is one of the best developed in Europe, but income results in agriculture are higher than in the agri-food industry. Nevertheless, the German agribusiness is considered to be the best developed in the whole EU.

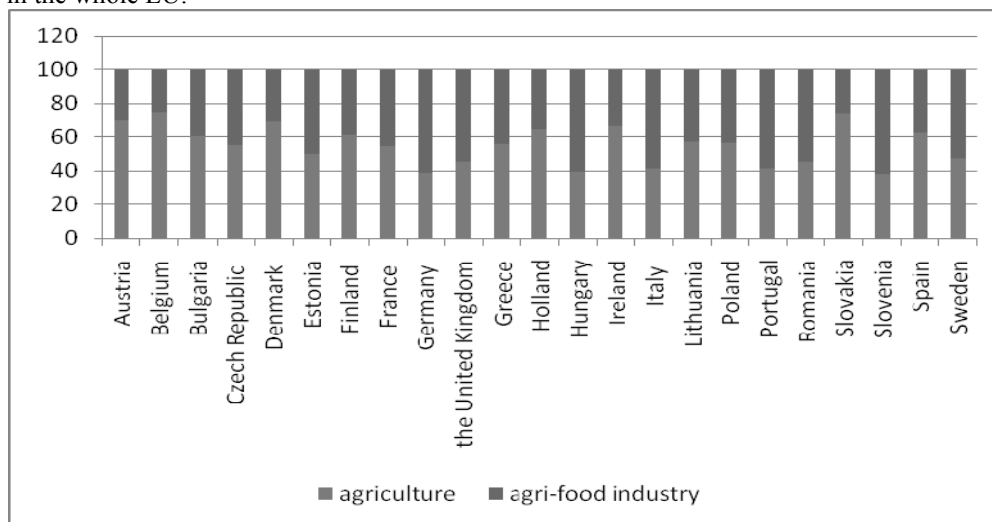


Fig. 3. Internal structure of gross value added in the EU agribusiness, %

Source: own elaboration based on data from Tables 1 and 2.

Figure 4 presents the agri-business share in gross value added of national economies in the EU countries. It is the lowest in Germany, Sweden, Finland and Great Britain (about 2.2%), relatively low in Belgium and Denmark (3%), while the highest in Romania (18%), Lithuania (12%) and Bulgaria (10%). In Greece and Poland, this index value reaches about 7%. The results of the research confirm that the share of agri-business in national economy tends to decrease with the economic development of countries.

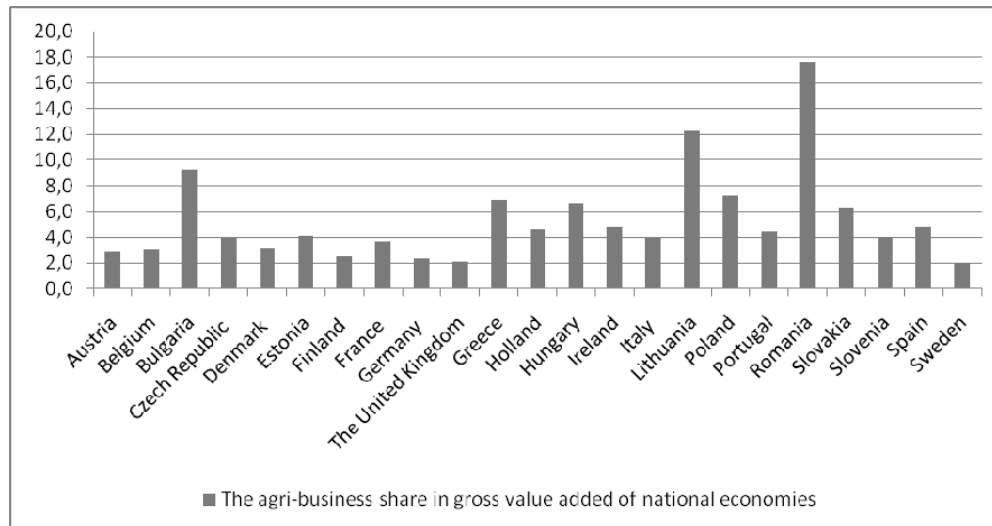


Fig. 4. The agribusiness share in gross value added of national economies in the EU countries, %  
 Source: own elaboration based on the data from Tables 1, 2 and the Eurostat [Economic... 2011].

## Conclusions

Results of this research prove that the agribusiness development is strongly determined by the level of economic development of a country. Agri-food industry dominates in the agribusiness structure in the better developed EU countries, i.e. Germany, Belgium, Austria and Sweden. Moreover, in these countries, the agri-business share in national economy (measured by global production and gross value added) is relatively low. In contrast, in the less developed EU countries (Bulgaria, Romania, Poland, Greece, and Slovakia), agriculture dominates in the internal structure of agri-business, while the agribusiness share in the overall economy is high. The results suggest that the economic growth is essential for the improvement of agribusiness structure. Tomczak [2000] states that one of the ways to stimulate economic growth is to enhance the labour productivity in all sectors of national economy including agribusiness.

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