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KAROLINA PAWLAK

Poznan University of Life Sciences, Faculty of Economics and Social Sciences, Department of Economics and Economic Policy in Agribusiness, Poland

COMPETITIVENESS OF THE POLISH MEAT INDUSTRY AGAINST SELECTED EUROPEAN UNION COUNTRIES WITHIN THE FRAMEWORK OF TRANSATLANTIC TRADE

Abstract:

The aim of the paper was to assess the competitive capacity of the Polish meat industry in trade with the US in relation to major EU producers of meat and meat preparations. Referring both to the growth and trade theories in research on international competitiveness and based on the methodological approach proposed by Wijnands, van der Meulen and Poppe (2006) to estimate the competitive capacity of the meat industry in the analysed countries the study used a set of economic and trade indicators appropriately adapted to the requirements of the analysis of bilateral relations. The indexes based on the market and trade shares included shares in exports to the target market and indexes of relative trade advantage, while the applied economic indexes included the real value added and its share in the total value added of the food industry and real labour productivity. The time frame for the analyses covered the years 2007-2016. The study is based on data from the European Statistical Office (Eurostat). Summing up the analyses it may be stated that in the years 2007-2016 the competitive position of the Polish meat industry in trade with the US in comparison to the leading EU producers of meat and meat preparations was strengthened both thanks to an improved trade position (measured by the share in the EU exports to the US market and relative trade advantages) as well as economic indicators connected with an increase importance of the analysed sector in the generation of real value added of the food industry and labour productivity.

Keywords:

competitiveness, meat industry, market share, relative trade advantage, real value added, labour productivity, Poland, the EU countries, the US market

JEL Classification: F14, L66, Q13

Introduction

The meat industry is the largest sector in the Polish food economy. Production of animals for slaughter is the primary source of income in agriculture (over 35% agricultural market output; The statistical yearbook of agriculture, 2017), while the meat industry is one of the most dynamic sectors of the food industry. In 2016 every fifth food processing enterprise in Poland was operating in the meat sector and these enterprises employed almost 115 thousand people, i.e. almost 1/3 total labour force employed in food processing. Turnover of the meat industry also accounted for approx. 30% value of total turnover of the food industry in Poland (Eurostat, 2018). What is important, thanks to investments in the first years after Poland's accession to the EU due to the need to adapt to EU requirements and standards, the meat industry in Poland was able to develop faster than in the other EU countries. In real prices in the years 2003-2013 the value of turnover in that branch of the food industry in Poland increased almost 2-fold, in the EU-15 countries by 30%, while in the EU-12 by 70% (Tereszczuk, 2015). Apart from the incorporation into the European Single Market resulting in the dynamic increase in exports, the most important factors determining the development of the Polish meat industry include growing domestic demand for meat and meat preparations resulting from increased disposable income of Poles, price advantage (lower raw material prices, lower costs of labour and other inputs)¹, increasing labour productivity and growing raw material base (Mroczek, 2015).

The meat sector is the largest sector in the EU food industry accounting for 23.5% of the total turnover of the food industry in 2016, with Poland having a strong position and ranking sixth after Germany, France, Spain, Great Britain and Italy both in terms of the production value and turnover. The importance of the meat sector in food economy is also shown by the share of expenditure on meat and meat preparations in the structure of expenditure on consumer goods and services. In 2015 in an average household in Poland expenditure on meat and processed meat products accounted for approx. 26% total expenditure on food and non-alcoholic beverages and 5.5% total consumption expenditure (Eurostat, 2018). This group of products plays an important role also in the trade exchange. In 2017 the value of exports of meat, edible meat offal and preparations of meat from Poland was over 6.1 billion EUR and accounted for approx. 22% total exports of agri-food products (Eurostat, 2018).

¹ For processors a particularly important aspect is connected with the raw material prices as it is the primary item in material costs, which in the meat industry account for approx. 80% base price (Mroczek, 2013). At Poland's accession to the EU prices of pigs for slaughter in Poland were on average by approx. 30% lower than in the EU, that of beef cattle by 60% lower and poultry by almost 40% lower. Despite progressing price convergence in Poland and the other EU countries, price advantage of Polish meat producers was maintained and in 2016 pigs for slaughter were still by approx. 20% cheaper, while beef cattle and poultry for slaughter - by 30% cheaper than the EU average (Eurostat, 2018). In turn, mean wages in the Polish meat industry are 2- to 4-fold lower than those in the largest EU meat producers (Mroczek, 2015).

The EU countries are the primary market for Polish meat products². However, it may be assumed that on the one hand at a limited increase in demand for food in the EU and on the other hand in view of the strong concentration of turnover within the European Single Market further development of this sector in the food economy in the EU to a considerable extent will depend on the potential to expand sales to non-EU markets. In order to effectively market products both on the EU and non-EU markets it will be necessary to cope with competitive pressure from other food suppliers. It should be stressed here that both the global and European meat industry is in a stage of major structural changes, with advances in breeding and genetics, slaughtering and the development of new processing automation technology and the increasing role of the distribution of a variety of fresh and processed products on the global meat market (Bojnec, Fertö, 2014). All these issues are significant factors in increasing competitiveness of the meat industry and maintaining a sustained ability to earn profitable gain and market share.

Search for new markets is essential in view of surplus production of meat in relation to the domestic market needs recorded both in Poland and the other EU countries. The self-sufficiency ratio (SSR), which is defined as the percentage of food consumed that is produced domestically (Clapp, 2017), shows that in 2013 the volume of meat production in Poland and all the EU countries exceeded the total supply by more than 32% (SSR=132.3%) and almost 6% (SSR=105.8%)³, respectively, thus indicating considerable export potential for this group of products. For the EU countries the United States is a major economic partner, as well as a competitor on international markets. The Transatlantic Trade and Investment Partnership (TTIP), so far unsuccessfully negotiated, is evidence for the intention to enhance mutual economic relations and at the same time an attempt to maintain a strong position of the EU and the USA on the international market, particularly in view of the increasing political importance and considerable economic potential of the BRICS countries (The BRICS Report, 2012; Sporek, Czech, eds., 2015; Nassif, Feijo, Araújo, 2016; Nayyar, 2016; Siddiqui, 2016). In the context of problems in the EU-USA relations increasing during the presidency of Donald Trump, the issue of competitiveness of the economies of these trade partners and their individual sectors both on the world market and in the bilateral system is particularly gaining in importance. In the trade relations of Poland with the US the meat sector is a priority. In 2017 exports of meat, edible meat offal and preparations of meat accounted for over 45% total exports of agri-food products to the American market (in value terms). Having this in mind, the question is whether the Polish meat industry is competitive on the US market and what are key factors that shape the competitiveness of this sector. For this reason the aim of this paper was to assess the competitive capacity of the Polish meat industry

² Almost 85% exports for this assortment group are subject to intra-EU trade (Eurostat, 2018).

³ The authors' calculations based on data of the Food and Agriculture Organization of the United Nations (FAOSTAT).

in trade with the US in relation to major EU producers of meat and meat preparations using selected economic and trade indicators.

Methodological remarks

Competitiveness is a relative, multidimensional concept which may be assessed based on various theories (See e.g. Porter, 1990; Siggel, 2006; Latruffe, 2010). The concept of competitiveness may be defined e.g. applying the theory of economic growth and international trade, as a result deriving also indicators aiming at the evaluation of the international competitive position and competitive capacity of national economies or their sectors. Research on competitiveness based on the theory of economic growth stressed overall or partial outcomes reached by the national economy. Competitiveness of an economy is defined here as “the degree to which a nation can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously maintaining or expanding the real incomes of its citizens” (President’s Commission on Industrial Competitiveness, 1985). In this approach competitiveness is measured using typical measures of economic growth, among which Krugman (1994) and Fagerberg (1996) considered the productivity growth to be crucial. The latter researcher particularly stressed that this concept needs to be investigated in relative terms and when assessing the level of competitiveness we need to apply relative rather than absolute measures of economic growth. Fagerberg (1996) also indicated that the objective of a competitive economy is on the one hand to ensure economic welfare of the population, while on the other hand – to promote international trade.

A similar definition to that of national economy competitiveness proposed by Fagerberg (1997), but in relation to its sector (i.e. at the mesoeconomic level), was formulated by Devine (1996) after Singh (1977). According to those authors an efficient, i.e. a competitive sector is capable not only of satisfying the demand on the national market, but also on foreign markets, generating from this activity resources to cover necessary import expenditure, while maintaining socially acceptable levels of production, employment and exchange rates. These definitions may be considered to refer to the theory of economic growth and international trade, in which competitiveness is seen as the capacity to maintain or increase market shares (van Duren, Martin, Westgren, 1991; Kennedy et al. 1997; Pitts, Lagnevik 1998; Fischer, Schornberg, 2007). Competitiveness of the food industry and its individual sectors may also be defined as “sustained ability to achieve profitable gain and market share in domestic and export markets in which the industry is active” (Wijnands et al., 2008; Wijnands, van Berkum, Verhoog, 2015). This is consistent with the opinion by Krugman (1994), who indicated that measuring competitiveness on foreign markets does not make sense if the activity of a given industry focuses almost entirely on the domestic market.

Referring both to the growth and trade theories in research on international competitiveness and based on the methodological approach proposed by Wijnands, van

der Meulen and Poppe (2006) to estimate the competitive capacity of the meat industry in the analysed countries the study used a set of economic and trade indicators appropriately adapted to the requirements of the analysis of bilateral relations. The indexes based on the market and trade shares included shares in exports to the target market and indexes of relative trade advantage, while the applied economic indexes included the real value added and its share in the total value added of the food industry and real labour productivity⁴.

The share in exports is the simplest measure of international competitive position of a given country or sector. It may be assumed that when the share of the investigated country in exports to a specific target market does not change or it increases, its competitive position on this market is maintained or strengthened.

The Relative Trade Advantage Index (RTA), being a difference of indexes for observed comparative advantages in exports (Relative Export Advantage Index – RXA) and imports (Relative Import Advantage Index – RMA), facilitates estimation of comparative advantages, at the same time taking into consideration the import and export situation of a given country. The former is a ratio of the share of exports for the analysed product in world/regional exports to the share of exports for the entire sector in world/regional export, while the latter is determined in an analogous manner for import (Scott, Vollrath, 1992):

$$RXA_{ij} = (X_{ij} / X_{nj}) / (X_{ik} / X_{nk}) \quad (1)$$

$$RMA_{ij} = (M_{ij} / M_{nj}) / (M_{ik} / M_{nk}) \quad (2)$$

where: X – exports, M – imports, i – investigated country, j – analysed product/group of products, k – all goods, n – reference country/countries. In order to realise the adopted objective of this study the volume of trade turnover was investigated in the bilateral relation between an EU country and the US. A positive value of RTA indicates a competitive advantage and a negative value – an adverse competitive situation (Frohberg, Hartmann, 1997).

The real value added at factor costs (RVA) illustrates an increment of values of goods as a result of the production process and it reflects the competitive position of the food industry and its sectors on the national market. It needs to be stressed here that competitiveness of the national economy (or its sector) on the international market is founded on the competitiveness of economic entities, which are operating within that country. The higher the standard of modernisation and the greater the quality represented by the domestic economic entities and the greater their efficiency, the greater the chance for the national economy to meet the requirements of international competition (Cf.

⁴ An identical set of indexes in studies on competitiveness of the food industry of the EU in relation to the US, Australia, Brazil and Canada was applied by Wijnands and Verhoog (2016). Competitiveness of the Swiss food industry in relation to selected EU-15 countries was investigated in this way by Wijnands, van Berkum and Verhoog (2015), while that of the Polish industry – by Tereszczuk (2016).

Chesnais, 1988). The real value added at factor costs is derived when the nominal value added is deflated by the consumer price index:

$$RVA_{ij} = VA_{ij} / CP_i \quad (3)$$

where: VA – nominal value added, i – investigated country, j – analysed sector of the food industry, CP – consumer price indicator.

In relation to the studies by Krugman (1994) and Fagerberg (1996), it was decided to consider labour productivity (Real Labour Productivity – RLP), measured by the real value added per 1 person employed in a given sector, as one of the key determinants of competitiveness:

$$RLP_{ij} = RVA_{ij} / E_{ij} \quad (4)$$

where: E – the number of employed in the analysed sector of the food industry.

The importance of the analysed sector in comparison to the other sectors of the food industry was evaluated based on the shares of individual sectors in the real value added (Real Value Added Share – SRVA) of the entire food sector:

$$SRVA_{ij} = RVA_{ij} / RVA_{im} \quad (5)$$

where: m – food industry (as a whole).

In reference to the dynamic approach to competitiveness of the food industry, changes in competitiveness of the meat sector on a given target market in relation to competitors were evaluated based on changes in values of the above-mentioned indexes in the starting and ending years of the two periods of analysis (2007-2011 and 2012-2016). Changes in trade indexes were determined in the absolute terms in percentage points, while in the case of economic indexes the dynamics indicators were applied. Thus the increments of these indicators are investigated, so that countries may be compared despite differences in purchasing power parities. In order to facilitate comparisons all the indicators were standardised according to the formula:

$$z\text{-score} = (\text{individual non-standardised indicator} - \text{arithmetic mean of indicators for investigated countries}) / \text{standard deviation} \quad (6)$$

Next a synthetic measure of competitiveness was determined, being an arithmetic mean of five applied partial indicators, which comprehensively illustrates the competitive position of the analysed country in a given sector of the food industry in relation to the other reference countries on a specific target market. Values of z-score indicators reach dimensionless quantities from the [-2, 2] intervals, have the mean of 0 and standard deviation of 1.

In accordance with the statistical classification of economic activity in the EU (NACE), meat industry includes the production, processing, preserving of meat and meat products (NACE C101), while the food industry is understood as production of foodstuffs excluding

beverages and tobacco products (NACE C10). This study is based on data from the European Statistical Office (Eurostat). The time frame for the analyses covered the years 2007-2016, divided into two research periods of 2007-2011 and 2012-2016.

Evaluation of changes in competitiveness of the Polish meat industry in trade with the US in relation to selected EU countries in the years 2007-2011 and 2012-2016

In 2016 the largest meat manufacturers within the EU were Germany, France, the United Kingdom, Spain, Italy and Poland. Almost 75% of all enterprises of the EU meat industry were operating in those countries and they were employing almost 630 thousand people, i.e. approx. 70% total employees of that sector in the EU. They generated the part of the EU turnover and value added of the analysed sector slightly exceeding the respective proportion in relation to the share in employment (74% and 76%, respectively; Table 1). The greatest concentration of economic activity was observed for the meat industry in the United Kingdom, where one enterprise operating in the sector generated over 3.5-fold greater turnover than the EU mean and almost 5-fold greater value added. A greater than the EU average value of turnover was also generated by meat processing enterprises in Spain and Italy, while the level of value added exceeding the EU mean was recorded for meat industry enterprises in Spain and France. In view of the fact that the average number of employed in one enterprise in these three countries was lower than the mean for the entire EU, it is a positive finding for the sector labour productivity.

Table 1: Overview of the meat industry in the EU countries in 2016

Specification	Unit	France	Germany	Italy	Poland	Spain	United Kingdom	EU
Enterprises	Number	5 811	10 247	3 463	2 683	3 676	1 014	36 819
	EU=100	15.8	27.8	9.4	7.3	10.0	2.8	100.0
Turnover	Billion EUR	33.8	45.9	22.3	15.6	24.6	22.5	223.0
	EU=100	15.2	20.6	10.0	7.0	11.0	10.1	100.0
Turnover per 1 enterprise	Million EUR	5.8	4.5	6.4	5.8	6.7	22.2	6.1
	EU=100	96.0	74.0	106.1	96.3	110.7	366.0	100.0
Value added	Billion EUR	5.9	6.6	3.0	2.1	3.9	4.6	34.6
	EU=100	17.1	19.0	8.7	6.0	11.3	13.4	100.0
Value added per 1 enterprise	Million EUR	1.0	0.6	0.9	0.8	1.1	4.6	0.9
	EU=100	108.7	68.2	92.7	81.9	113.5	486.2	100.0
Employees	Number	118 304	175 923	53 161	114 943	83 572	83 222	901 703
	EU=100	13.1	19.5	5.9	12.7	9.3	9.2	100.0
Employees per 1 enterprise	Number	20	17	15	43	23	82	24
	EU=100	83.1	70.1	62.7	174.9	92.8	335.1	100.0

Source: the authors' calculation based on the EUROSTAT data

The Eurostat data (2018) show that in the years 2007-2016 real labour productivity, measured by the value added per 1 employed in the meat industry in Spain, Italy and France was by approx. 30% higher and in the United Kingdom it was over 45% higher than the EU mean. Such a situation may be explained e.g. by the role of science and

innovation, technological developments and structural determinants in the meat-processing sector, as well as the qualified and experienced staff, labour organisation and incentive-based wage system (Bojnec, Fertő, 2014; Tereszczuk, 2015). Despite the significant improvement of labour productivity in the meat industry in the years 2007-2016⁵, more rapid than in the other EU countries leading in meat and meat preparations production, Poland remained the only among the analysed countries, in which real labour productivity in 2016 was over 50% lower than the EU average (in the years 2007-2011 it was by 66% and in 2012-2016 by 53% lower; Table 2).

Table 2: Competitiveness of the meat industry in Poland and selected European Union countries in the aspect of trade with the US in 2007-2016

Country	Period	Market share in the EU export to the US (%)	Relative trade advantage (RTA)	Real value added (million EUR)	Share in real value added of the food industry (%)	Real labour productivity (million EUR/employee)
France	2007-2011	1.8	-0.82	5 498.95	20.86	0.04
	2012-2016	2.2	-0.28	5 713.97	19.49	0.05
	Change	0.4	0.54	103.91	93.43	107.87
Germany	2007-2011	2.9	-0.72	6 149.19	21.78	0.03
	2012-2016	3.1	-0.66	6 234.07	19.95	0.04
	Change	0.2	0.06	101.38	91.61	102.97
Italy	2007-2011	16.5	0.41	2 516.22	14.29	0.05
	2012-2016	19.7	0.38	2 851.52	14.60	0.05
	Change	3.2	-0.03	113.33	102.13	114.45
Poland	2007-2011	15.4	8.46	1 300.27	18.78	0.01
	2012-2016	19.9	11.32	1 952.78	23.86	0.02
	Change	4.5	2.86	150.18	127.04	152.80
Spain	2007-2011	7.6	1.00	3 534.16	23.30	0.04
	2012-2016	8.6	1.08	3 785.33	24.96	0.05
	Change	1.0	0.08	107.11	107.12	108.92
United Kingdom	2007-2011	3.4	-1.89	3 047.11	13.90	0.04
	2012-2016	5.1	-1.04	3 946.09	15.48	0.05
	Change	1.6	0.85	129.50	111.35	127.58

Source: the authors' calculation based on the EUROSTAT data

Despite the marked discrepancy in labour productivity, in the years 2012-2016 Poland had an almost 20% share in the EU exports of meat, edible meat offal and preparations of meat to the US, generating in these exports the highest comparative advantages among the investigated countries, growing dynamically in comparison to the period of 2007-2011 (RTA=8.46 in the years 2007-2011 and RTA=11.32 in the years 2012-2016; Table 2). A low relative advantage in the case of trade in meat products with the US was also recorded by Spanish and Italian enterprises, while the other countries showed no

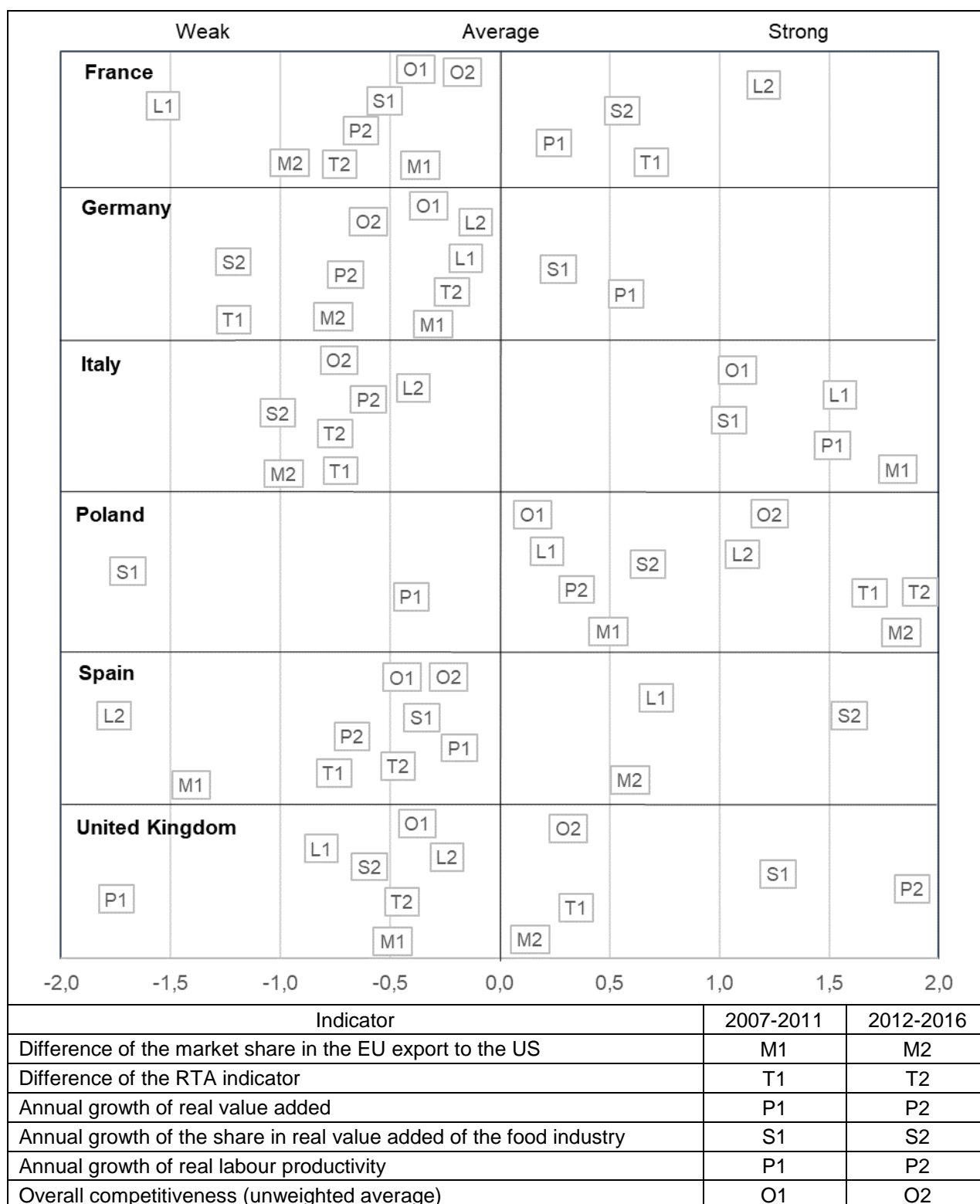
⁵ Improved labour productivity in the Polish food industry following Poland's accession to the EU resulted mainly from the increase in the capital to labour ratio, while it was to a relatively low degree related to an improved efficiency of use of total assets or the increase in the capacity to generate value added in relation to revenue (Gołaś, 2010).

such advantage. Such a situation seems to be particularly disturbing in the case of Italy, which share in the EU exports of this assortment group onto the US market was comparable to that of Poland and it was 2-fold (in comparison to Spain) up to 9-fold greater (in comparison to France) than in the other analysed countries.

An increased share in the exports of meat industry from the EU to the US (M) and economic factors related with the improvement of economic results of operations of meat sector enterprises (P), its share in the real value added of the food industry (S) and labour productivity (L), determined the strengthening of the competitive position of Poland on the US market in the years 2012-2016, both in relation to 2007-2011 and to competitors⁶ (Figure 1). The relatively high competitive advantage of the Polish meat industry observed in trade with the US in comparison to the other EU countries is a positive finding, e.g. in view of the importance of this sector in the generation of real value added for the entire food industry. In the years 2012-2016 enterprises of the meat industry in Poland generated almost 1/5 value added of the food processing sector, in this respect being only slightly less efficient than Spanish enterprises (Table 2), in the case of which a marked increase in the contribution of the analysed sector to the total value added of the food industry (S) and the simultaneous improvement of the competitive position in the EU exports to the US (M, T) eliminated the deterioration of real labour productivity (L). Thus in the synthetic terms competitiveness of the analysed sector over the entire investigated period was stable, but below the average (O; Figure 1). In turn, weakening of the economic advantage (P, S, L), accompanying a decrease in the share in exports to the US market (M), resulted in a loss of greater than average competitive advantage recorded in 2007-2011 by meat processors from Italy and a deterioration of already lesser than the reference average competitive position of German enterprises. The ability to maintain a relatively stable, but only close to the average capacity to compete in trade with the US was observed for meat processors from France. In that country the observed improvement in economic indicators (S, L) was accompanied by a loss of trade position (M), preventing any considerable advance in the overall competitiveness (O). In the years 2012-2016 among the analysed countries the strongest competitor for Poland in exports of meat preparations onto the US market was the United Kingdom, in which an increase in real value added in absolute terms (P), labour productivity (L) and the share in transatlantic trade (M) was compensated for with a surplus by the simultaneous loss of relative comparative advantages (T) and a reduced importance in the generation of total value added of the food industry (S), contributing to better than average competitive advantage (O).

⁶ It results from the analyses by Wijnands and Verhoog (2016) that a systematic improvement of the competitive position of the Polish meat industry on the world markets could be observed as early as 2003. This was possible thanks to the compensation for the labour productivity lower than in the other countries leading in the production of meat and meat preparations in the EU by lower costs of inputs, including several times lower labour costs and lower processing margins, providing a price-cost advantage.

Figure 1: Developments in competitiveness of the meat industry in Poland and selected European Union countries in relation to the US market in 2007-2011 and 2012-2016



Source: the authors' calculation based on the EUROSTAT data

Conclusion

The article attempts to assess the competitive advantages of the Polish meat industry on the US market and to identify key factors that shape these advantages. Summing up the analyses it may be stated that in the years 2007-2016 the competitive position of the Polish meat industry in trade with the US in comparison to the leading EU producers of meat and meat preparations was strengthened both thanks to an improved trade position (measured by the share in the EU exports to the US market and relative trade advantages) as well as economic indicators connected with an increase importance of the analysed sector in the generation of real value added of the food industry and labour productivity. Despite a marked increase in labour productivity recorded following Poland's accession to the EU thanks to increased inputs resulted with the capital to labour ratio, Poland remained the only among the analysed countries, in which real labour productivity in the meat industry in 2016 was by over 50% lower than the EU mean. In consistence with the theses by Krugman (1994) and Fagerberg (1996) on the importance of the increase in labour productivity for the improvement of competitiveness of the food industry, this characteristic may be treated as a minimum factor limiting progress in the generation of a stable competitive position of the Polish meat processing on the US market and other markets, on which Poland remains an active exporter, including also the European Single Market. The competitive advantage relatively stronger than in the other analysed countries generated in trade with the US in the years 2007-2016 may be explained e.g. by the well-organised raw material base (particularly in the poultry industry) and lower costs of use of inputs, including lower raw material costs, several times lower labour costs and lower processing margins.

In relation with the high food self-sufficiency Polish meat processors are facing the need to search for new and attractive markets. At the same time, in view of the open market and progressing liberalisation of trade (on the regional scale or under plurilateral agreement) promoting increased competition on domestic and foreign markets, price-cost advantages are losing in importance being replaced by competitive tools providing a more stable competitive advantage. In the context of a study conducted it is essential for further development of the sector and improved international competitiveness of the Polish meat processing to enhance productivity thanks to progressing concentration and specialisation of production, improved use of available production capacities, further improvement of labour productivity and optimisation of production costs, e.g. thanks to the use of horizontal and vertical integration of food chain participants on the meat market. A significant role in the modification of competitive advantage in this branch of the food industry is now and also will be played in the future by technical advances and innovativeness of processing plants and distribution channels, as well as meat quality assurance at reasonable prices and implementation of innovative products resulting in an increased diversity of products, which – through export specialisation promoting high comparative advantages – will effectively meet demand preferences of consumers at

specific target markets (Cf. European Commission, 2011; Bojnec, Fertő, 2014; Mroczek, 2015).

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