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THE IMPACT OF CONCENTRATION OF PRODUCTION ON MARKET POSITION OF SELECTED BRANCHES OF FOOD INDUSTRY IN POLAND

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Abstract. The aim of this article is to present differences in concentration of production and their impact on the market position of the companies active in the fat and dairy sectors. The analysis covered the period from 2008 to 2012, including the global crisis and post-crisis situation in Poland, which accompanied it. The conducted research shows that the processes of adjustment of supply to market demand include: changes in the profile of manufacturing enterprises, rationalisation of behaviour in the sphere of production and resource management. For the research two branches: fat and dairy products, which are diverse in terms of supply and demand and concentration of production. This paper focuses on the production and revenue concentration in the branches of the food industry selected for the study. The study used a rich empirical material based on both the author's own research and secondary sources.

Key words: fat branch, dairy branch, concentration of production, market position of companies

INTRODUCTION

Food market in Poland is characterised by continued trend of consolidation processes through company mergers and acquisitions. The result of these activities is relatively high diversity of companies in terms of size and market share. There are both versatile enterprises (competing using the same methods and means) and specialized businesses. From the perspective of assessment of future development of the food industry it is important to determine the differences in concentration of production and revenues between the individual branches.

The aim of this article is to present differences in concentration of production and their impact on the market position of the companies active in the fat and dairy branches. Choice of these branches for the research was dictated by their different characteristics in terms of supply and demand. The presented branches are characterised by different concentration of production and capital as well as the varied pressure of demand for the products they offered. The analysis covered the period from 2008 to 2012, including the global crisis and post-crisis situation in Poland, which accompanied it.

TRENDS IN THE FOOD MARKET IN POLAND

In 90s of the last century the economic transformation began in Poland, which concerned also the food market. The internationalisation of the economy was initiated, which was connected with the inflow of foreign capital, including the largest global companies. Entry of the international companies into the Polish market initiated the process of globalisation of the economy,

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consisting of the introduction of new technologies, products as well as methods of organisation and management. Since 2002 we have seen considerable progress in the process of concentration and consolidation, involving, for instance, acquisition of Polish enterprises by foreign and domestic strategic investors, both industry and financial, and mergers of Polish companies. This situation has arisen in connection with European integration and the associated Polish accession to the EU, as well as the ongoing economic globalisation (Kraciuk, 2008). The modern food market in Poland has a characteristic of the oligopolistic competition model. The trend of consolidation processes through mergers and acquisitions can be seen (Szwacka-Mokrzycka, 2013). Polish accession to the EU has contributed to a significant development of the food industry. Over the years 2003-2010 average growth rate of food production (expressed in fixed prices) stayed at 5.2% per annum, which was almost three times higher than in the period from 1998 to 2002 (Urban and Mroczek, 2011). It is important to note the presence of a large similarity in the structure of the agricultural and food processing industry and the structure of food enterprises functioning in Poland and in other EU countries. Starting from 2004, the consolidation actions have been taken to encourage the concentration of the food industry in Poland (Pawlak and Poczta, 2011). As a result of the action taken, the position of large enterprises has been strengthened, while position of medium and small enterprises has been undermined. This has resulted in an increase in the proportion of large businesses, with a simultaneous decline of small businesses in food production in Poland. Similar trends have appeared throughout the EU market.

RESEARCH METHODS AND SOURCES OF INFORMATION

The research covered an analysis of concentration in the fat and the dairy branches based on Herfindahl-Hirschman Index (HHI), Gini coefficient) and Lorenz curve. The calculations were made on the basis of data from the financial statements of companies submitting financial statements to the National Court Register (KRS) and publishing the financial results in Infoveriti.

Analysis of concentration[1]

The following measures were used to determine the branch concentration: Herfindahl-Hirschman Index (HHI)[2], Gini coefficient[3], and the results were presented using Lorenz curve[4].

Table 1 shows the development of the Herfindahl-Hirschman Indices in the years 2008-2010 in the branch cross-section 10.00 (food industry) and fat (I) and dairy (II) branches.

According to the HHI in total food sector and in branch II there is a low concentration. The data contained

Table 1. Herfindahl-Hirschman Indices in the years 2008–2010

Tabela 1. Wskaźniki Herfindahla-Hirschmana w latach 2008–2010

	2008	2009	2010
Food Industry Przemysł spożywczy	65	66	59
Branch I Branża I	1 574	3 029	2 467
Branch II Branża II	473	479	398

Source: own elaboration.
Źródło: opracowanie własne.

[1] This elaboration is constructed on the basis of data from the financial statements of companies submitting financial statements to the National Court Register (KRS) and publishing the financial results in Infoveriti (www.infoveriti.pl).

[2] HHI Index is a measure of market concentration and determines the estimated level of concentration in the branch and the level of competition in the relevant market. HHI is calculated as sum of squares of market shares expressed as a percentage. Its value ranges between 10 000/n and 10 000 (where n is the number of enterprises). Fall of the Herfindahl-Hirschman Index implies a decrease in strength of the manufacturers and an increase in competition and rise of the index vice versa. Food Industry (10.00).

[3] Gini coefficient is a measure of concentration (unevenness) of the distribution of a random variable. is the area between the Lorenz curve and the diagonal of the unit square multiplied by 2. Its values range from 0 to 100%, where 0% means a full evenness of the distribution and 100% means a full evenness of the distribution (only one variable cam have a positive value).

[4] The curve describes the degree of concentration, that is the unevenness of the distribution of global resource characteristics.

Table 2. Number of analysed enterprises in the years 2008–2010

Tabela 2. Liczba analizowanych przedsiębiorstw w latach 2008–2010

	2008	2009	2010
10.00	1 300	1 388	1 740
Branch I Branża I	18	21	25
Branch II Branża II	130	137	186

Source: own elaboration.
Źródło: opracowanie własne.

in Table 1 show that the total food production is characterised by a high dispersion of production and the revenues from the sales of the products. In branch I (fat) in 2008 there was a moderate concentration (HHI index > 1000), which in the years 2009-2010 decreased (HHI index > 1800) – chart 1 and Table 1.

Lorenz concentration ratio

The subject of the analysis of the Lorenz concentration ratio is the distribution of two variables in spatial terms (Mruk, 2003). In the light of the interpretation of the method shown in Chart 1, it can be concluded that the closer to the main diagonal of the even distribution is the actual distribution, the lower is the concentration, but it becomes higher as the actual distribution gets more remote from the diagonal.

The Lorenz concentration ratio is a dimensionless measure in the range 0 = k = 1. Where k = 0, the phenomena are spread out evenly, when k = 1 – there is a complete concentration.

After a comparative analysis of concentration of revenues in 2010 and 2009, a slight fall for manufacturers of foodstuff (including branch I and II) has been observed; see: charts 3 and 4. The likely reason for this change was an increased competition in the market, forced by post-crisis situation, in which the companies were in 2010. They were forced to lead a more aggressive pricing policy to maintain the previous level

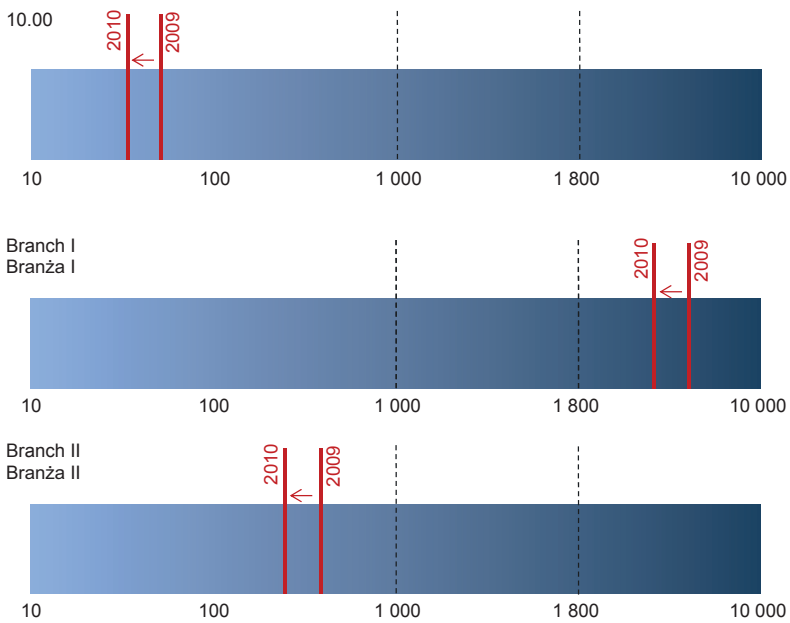

Fig. 1. HHI indices in 2009 and 2010
Source: own elaboration.
Rys. 1. Współczynniki HHI w 2009 i 2010 roku
Źródło: opracowanie własne.

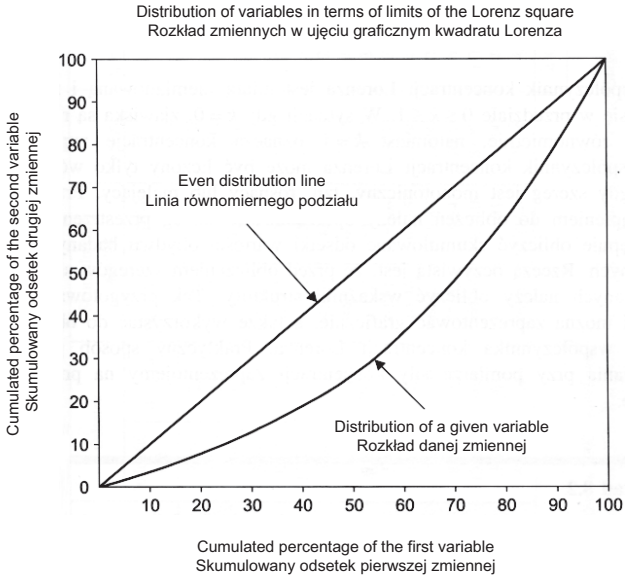

Fig. 2. Lorenz curve
Source: Mruk, 2003.
Rys. 2. Krzywa Lorenza
Źródło: Mruk, 2003.

of income. The studies carried out on the concentration of production and the income of the food industry have contributed to a view that its relatively high level is characteristic of the vegetable oil industry (it significantly exceeds the concentration ratio for the developed countries of the EU). In contrast, the Polish dairy industry is characterised by a much lower concentration than in the EU (cf. Urban and Mroczek, 2011). In the light of these findings it can be concluded that the concentration ratio is very strongly associated with the degree of globalisation of the branch.

Major players and their market shares

Another part of the analysis concerns the presentation of the market position of the leading companies in the analysed branches. This was done through the prism of the market share of the largest enterprise in the branch, as well as of three, five and ten largest companies.

In assessment of the participation of the largest companies of the food industry it can be concluded that the concentration of income is not large: ten biggest enterprises generate approximately 20% of income, and the "largest market player" generates only 2-3% (with the number of analysed companies in 2010 equal to 1740) – figure 5.

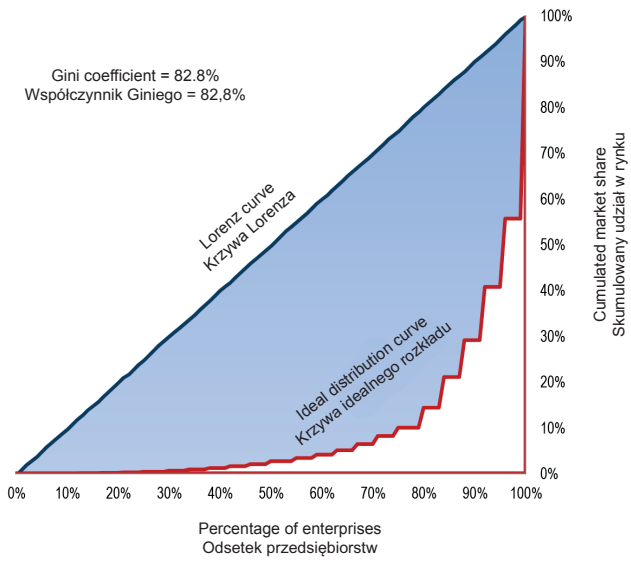

Fig. 3. Lorenz curve in 2010 for branch I
Source: own elaboration.
Rys. 3. Krzywa Lorenza w 2010 roku dla branży I
Źródło: opracowanie własne.

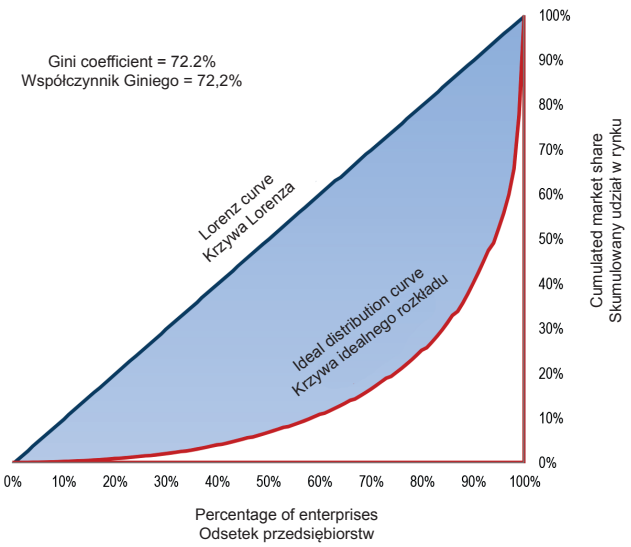

Fig. 4. Lorenz curve in 2010 for branch II
Source: own elaboration.
Rys. 4. Krzywa Lorenza w 2010 roku dla branży II
Źródło: opracowanie własne.

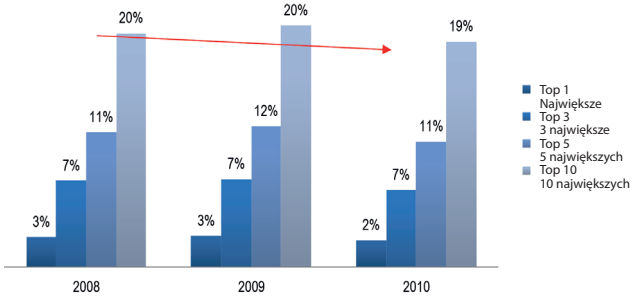

Fig. 5. Cumulated market shares of the largest companies in the 10.00 sector
Source: own elaboration.
Rys. 5. Skumulowane udziały rynkowe największych przedsiębiorstw w dziale 10.00
Źródło: opracowanie własne.

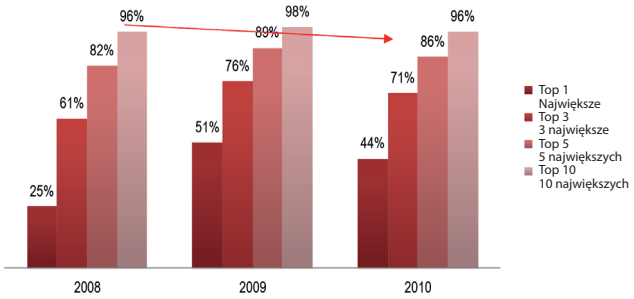

Fig. 6. Cumulative market share of the largest companies in branch I
Source: own elaboration.
Rys. 6. Skumulowane udziały rynkowe największych przedsiębiorstw w branży I
Źródło: opracowanie własne.

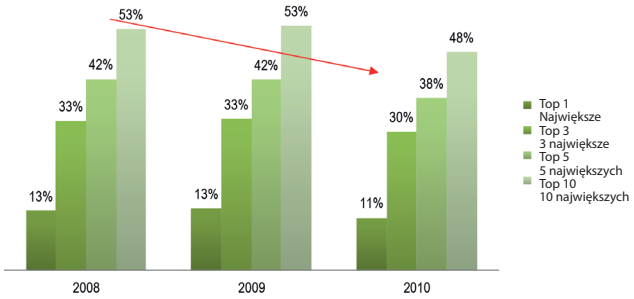

Fig. 7. Cumulative market share of the largest companies in branch II
Source: own elaboration.
Rys. 7. Skumulowane udziały rynkowe największych przedsiębiorstw w branży II
Źródło: opracowanie własne.

The situation is completely different in branch I (fat) (where in 2010 number of companies was small – 25). The described situation poses an increased risk for concentration in the market (due to the oligopolistic tendencies in the market organisation). The data show that ten largest companies generate 96% of revenues of the whole branch, see figure 6.

The concentration of income in branch II (dairy products) is bigger than in the entire food industry. In the analysed period, the largest company had approx. 11% share in revenues of the whole branch, and ten largest companies generate nearly 50% of revenues of the whole branch (with 186 enterprises analysed in 2010) – figure 7.

CONCLUSIONS

In the light of the carried out analysis, it can be concluded that there were large differences in concentration in the branches selected for the research. The research shows that the fat branch is characterised by a relatively high concentration ratio. Several major manufacturers fight for spheres of influence in the analysed market. Due to the weak relative position of suppliers and customers related to fat manufacturers, companies in the industry are forced to strongly compete in the conditions of limited demand (despite of the fact that they dictate prices to consumers and suppliers).

In contrast, the dairy branch is characterised by a relatively low level of concentration, the presence of many manufacturers and the moderate development of competition. Thus it should be concluded that the situation and the development opportunities for dairy manufacturers are different from the ones of fat manufacturers. Considering the increasing bargaining power of suppliers (farmers and producers of feed) and purchasers (large retailers), dairy producers are "trapped" in the value chain without the possibility of backward or forward horizontal integration due to lack of the necessary resources and competencies.

The conducted analysis of prospects for the development of dairy branch shows a moderate possibility of growth of its revenues. Development opportunities for fat manufacturers are dependent on market demand potential and the possibility of emergence of and support to new market niches.

In conclusion we can say that concentration is a positive phenomenon – it strengthens the position of

enterprises in the community and global markets. On the other hand, it supports the tendency to monopolise the Polish industry.

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WPŁYW KONCENTRACJI PRODUKCJI NA POZYCJĘ RYNKOWĄ WYBRANYCH BRANŻ PRZEMYSŁU SPOŻYWCZEGO W POLSCE

Streszczenie. Celem artykułu jest przedstawienie zróżnicowania poziomu koncentracji produkcji i jego wpływu na pozycję rynkową przedsiębiorstw działających w branży tłuszczowej i przetworów mlecznych. Analizą objęto lata 2008-2012, obejmujące kryzys światowy i towarzyszącą mu sytuację pokryzysową w Polsce. Z przeprowadzonych badań wynika, że procesy dostosowawcze podaży do popytu rynkowego obejmują zmiany w profilu wytwórczości przedsiębiorstw oraz racjonalizację zachowań podejmowanych w sferze produkcji i gospodarowania zasobami. Do badań wybrano dwie branże: tłuszczową i przetworów mlecznych, odmienne pod względem charakterystyki podażowej i popytowej oraz poziomu koncentracji produkcji. Przedmiotem badań w prezentowanym opracowaniu jest poziom koncentracji produkcji i przychodów wybranych do badań branż przemysłu spożywczego. W opracowaniu wykorzystano bogaty materiał empiryczny, pochodzący zarówno z badań własnych, jak i źródeł wtórnych.

Słowa kluczowe: branża tłuszczowa, branża przetworów mlecznych, koncentracja produkcji, pozycja rynkowa przedsiębiorstw

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