THE SPATIAL CONCENTRATION AND SPECIALIZATION OF AGRICULTURAL PRODUCTION IN EU

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Abstract

Agriculture is a very specific sector of the economy, significantly different from other economic activities. One of the main distinguishing characteristics of agricultural production is its surface character and strong dependence on environmental conditions, especially the nature. These conditions determine to a large extent on the structure of crops and livestock, but it is not completely determined. Therefore, it seems reasonable, taken in this article, an attempt to show concentration and specialization of agricultural production in the EU. The aim of this article is to attempt to identify the main trends in the spatial concentration of agricultural production in the EU. Another objective is to determine the specialization of individual member states in types of agricultural production. The study used location factor (LQ), which can also be used to study the concentration and specialization of region. The main results show there is a concentration of agricultural production in the EU and there are the countries specializing in a particular types of agricultural production. The analysis will be conducted on the basis of data taken from the Central Statistical Office of Poland. The analysis is conducted for the years 2005, 2010, 2012.

Key words: *agriculture production, concentration, specialisation*

INTRODUCTION

EU membership means that agriculture of each country is influenced by Common Agricultural Policy and is subject of competition by other countries. At the same time, agriculture in each country retains its identity and specificity. This is reflected in the natural conditions of agricultural production, the role of agriculture in the economy, as well as factors of production resources and their performance [10]. Currently it can be noted the general trends of changes in the direction of reducing the number of farms. In this same time the growth of surface production units, can be observed. This changes are slow processes and mechanisms are required to start the stimulus so at EU level and at national level [2]. The regional diversity of agriculture in European Union is discussed by Tłuczak, where the issues of similarities the level of development of agriculture are discussed [16, 17, 18,19, 21].
The subject of this study is related to the analysis of spatial concentration and specialization of agricultural production in the European Union. The main aim of this study

is therefore to answer the following questions: (1) Whether there is and how strong is the concentration of individual major types of agricultural production in the EU; (2)What is the nature of this production in the distinguished spatial units. The analysis will be conducted on the basis of data taken from the Central Statistical Office of Poland. The analysis is conducted for the years 2005, 2010, 2012.
The specialization and the concentration sometimes are treated as connected processes and even identical. If at the theoretical level their connection depends on theories which we take into account, at the empirical level the analysis of the diverse economic activities use the same data for the specialization and the concentration. Most of the empirical studies treat both processes as parallels, that is the dynamics of the specialization is always accompanied with the same dynamics of the concentration [3].
The phenomenon of the regional specialization generated a considerable interest among the economists, the geographers and the historians. Since Adam Smith's major work the specialization was

connected with the regional development and the economic growth [5].

The theoretical literature on location theory and the spatial consequences of economic integration has by now become very voluminous, encompassing elements of trade theory, growth theory, urban economics and economic geography [13].

Economic theories are far from being able to explain or even predict the changing specialisation and concentration patterns. Different models from (new) trade, (new) growth and (new) economic geography come to distinct conclusions, depending on their assumptions, a possible change of parameters in time, mobility patterns, transaction costs and the extent to which variables are endogenous. Consequently, empirical work should shed some more light on the European economic landscape [11, 12].

Specialization of countries in particular sectors and concentration of economic phenomena in regions or countries have long been treated as closely related economic phenomena, if not identical [1]. In polish literature the subject of spatial concentration and specialisation is considered i.a. by Szewczyk, Łobos, Tłuczak [8, 9, 15, 16, 20].

The definitions of both regional specialisation and geographic concentration are based on the same production structures, reflecting the same reality. Regional specialisation expresses the territorial perspective and depicts the distribution of the shares of the economic activities in a certain region, usually compared to the rest of the country, while geographic concentration of a specific economic activity reflects the distribution of its regional shares [6]. Although the bulk of the literature on specialization and concentration implicitly or explicitly treated these two phenomena as interrelated, there are some empirical outcomes suggesting they would rather be considered as independent processes since they "might not in all cases move in the same direction, and are probably going to take place at different speeds". Furthermore, the model in Rossi-Hansberg [1] was used for empirically proving that specialization and concentration may even go in opposite directions when transport costs

change. More specifically, as transport costs lower the degree of concentration tend to increase, while the level of specialization decrease [1].

MATERIALS AND METHODS

There are many standard statistical indices of dispersion which might be employed to measure the specialization and concentration. Location quotients can be interpreted as a local measure of geographical concentration of industries. They are calculated as the quotient between the local share of value of specific agriculture production and the local share of global value of specific agriculture production. Location quotients is given by formula:

$$LQ = (E_{i,r} / E_i) / (E_r / E)$$

where $E_{i,r}$ is the value of agriculture production sector i region r, E_i is the the value of agriculture production in sector i, E_r is the value of agriculture production in region r and E is the value of agriculture production in EU.

A value of 1 means that region r has the same share of agriculture production in sector i as its share of global value of agriculture production.

A value greater than 1 means that region r has a higher share of value of agriculture production in sector i than its share of global value of agriculture production [8, 9, 15, 19, 20, 21].

Location quotients can also be interpreted as a local measure of sector specialisation for local areas. They compare for each sector of agriculture production the sector's share of local area value of agriculture production with its share of global value of agriculture production. In this case location quotient is given by this same formula as in the case of the concentration, but the interpretation is slightly different:

$$LQ = (E_{i,r} / E_r) / (E_i / E)$$

where $E_{i,r}$ is the value of agriculture production in sector i region r, E_r is the value of agriculture production in region r; E_i is the value of agriculture production in sector i, and E is the global value of agriculture production in EU.

A value of 1 means that an sector's share of value of agriculture production in region r is the same as its share of global value of agriculture production in EU. A value greater than 1 means that sector i makes up a larger share of value of agriculture production in the local area than at the global (EU) level [8, 15]. The research hypotheses can be stated as follows:

H1: there is a concentration of agricultural production in the EU;

H2: there are the countries specializing in a particular direction of agricultural production;

H3: CAP intervention's instrument conducive to concentration and specialisation of agriculture production. The analysis will be conducted on the basis of data taken from the Central Statistical Office of Poland. The analysis is conducted for the years 2005, 2010, 2012.

RESULTS AND DISCUSSIONS

The employment in sectors is the most frequently used in research of specialisation and concentration. In this study the value of agricultural production in euro per 1 dt for crops or animal for slaughter were used to determine the specialization of agricultural production in the member states of the European Union. The agricultural production were considered broken down by crop and animal. The crop production for the production of wheat, rye, barley, potatoes, sugar beets and animal production - beef, pigs and poultry.

LQ ratios were calculated for each the European Union countries, taking as a reference area the whole Union. This made it possible to determine the spatial diversity of concentration and specialisation in the various sectors of agricultural production in the EU. LQ index using an analysis of the concentration local agricultural production across the EU. Data on the degree of concentration of individual countries in separate sectors of agricultural production present table 1.

Due to the crop production the smallest concentration was observed in the case of Portugal and the Netherlands.

Table 1. Location quotient results for sectors of agricultural production*

		LQ <1	LQ > 1
2005	crop	PT, MT, CY, SI, ES, IE, NL, BE,IT, DK, AT, LU	DE, HR, PL, HU, UK, FI, SE, EE, FR, RO, EL, CZ, SK, T, BG, LV
	animal	LV, BG, LT, SK, CZ, EL, RO, FR, EE, SE, FI, UK, HU, PL, HR, DE	LU, AT, DK, IT, BE, NL, IE, ES, SI, CY, MT, PT
2010	crop	PT, CY, IE, SI, MT, IT, BE, ES, NL, AT, DK, DE	PL, HR, HU, FI, LU, UK, SE, EE, EL, RO, FR, SK, CZ, LT, LV, BG
	animal	BG, LV, LT, CZ, SK, FR, RO, EL, EE, SE, UK, LU, FI, HU, HR, PL	DE, DK, AT, NL, ES, BE, IT, MT, SI, IE, CY, PT
2012	crop	PT, CY,NL, IE, MT, BE, ES, SI, IT, AT, DK, DE	PL, LU, HU, UK, FI, EL, RO, HR, SE, FR, EE, CZ, SK, LT, LV, BG
	animal	BG, LV, LT, CZ, SK, FR, RO, EL, EE, SE, UK, LU, FI, HU, HR, PL	DE, DK, AT, IT, SI, ES, BE, MT, IE, NL, CY, PT

* due to the limitations of the work, instead of the full names of countries the codes were used on the basis of http://publications.europa.eu/code/pl/pl-370100.htm

These are countries that reach one of the highest values LQ in animal production. After all, these are the countries which are experiencing a continuous growth of production in this area. When analyzing the distribution of crop production in wheat, barley, rye, potatoes and sugar beet we can say that Poland, Hungary and Austria are the countries where the greatest concentration of production of rye and sugar beet. Hungary and Italy have specialized in the production of wheat, and Spain in the production of barley. Considering livestock production in order to split the production of beef, pork and poultry should be noted that Portugal and Ireland are the countries where the greatest concentration of modality and thus specialization, beef and pork.

Breeding pigs in Europe and the market for pork is one of the least controlled using the

mechanisms of the Common Agricultural Policy. There is no surcharge direct market intervention and instruments are used occasionally. Besides, technological characteristic of this type of production (mainly the high fertility of sows and fattening relatively short period of time) are conducive to significant fluctuations in the level of production, which in turn translates into fluctuations in pricing. Therefore, both in the EU countries predominate numerically relatively small holdings keeping the herd with this is that new countries are mainly entities with 1 or 2 pieces (in 2010 there were almost 70%). This should be associated with a greater role of self-supply in countries where agriculture standing on the lower level of development, characterized by both lower marketable. As with other fields of animal production, the number of holdings with sheep decreased between 2005 and 2010. Only in Ireland, there was a 35% increase. Despite the reduction in the number of holdings with cattle (about 30% in the EU-27), in 2005-2010 the number of cattle in the Member States only reduced by less than 3%, with similar trends in new and old Member States, which in itself indicates the processes of concentration. These reasons connected with the need to meet the standards have contributed to the reduction of entities with small-scale farming, and consequently to reduce the number of stocks held by them. This process of concentration is also evident in the case of changes in the average herd of cattle, which has increased in almost every country (except in Ireland, where it remained almost unchanged, although a high level).

CONCLUSIONS

Almost all the EU member states have increased the value of agricultural production. The highest dynamics occurred in Poland, Estonia, the Czech Republic and Romania. In the years 2005, 2010, 2012, the share of countries adopted in 2004, the EU plant and animal production. Trends that occur in the structure of production in the EU are reflected in agricultural production in each country separately. Note the decrease in the

production of cereals, sugar beet and potatoes. The subordination of agriculture in all countries the rules of the CAP, as well as the processes of globalization causes the changes in the level and structure of agricultural production are member countries coincide. There is a tendency to specialize in agricultural production of selected EU countries. In countries where growing environmental requirements of fattening animals, and land prices are high (Denmark, the Netherlands, Belgium), the focus on the production of piglets. In turn, in the central and eastern parts of Europe (including Poland and Germany) expands specialization in fattening pigs. Concentration of pig production varies considerably at EU countries. Highest occurs in Denmark, the Netherlands and Belgium, by far the lowest in Poland. At the same time in all the countries surveyed, there was a increase in the concentration of production, although the pace of this process is different.

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