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CHANGES IN THE PRODUCTIVITY OF AGRICULTURE AFTER POLISH ACCESSION TO THE EUROPEAN UNION

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Abstract. The article determines changes in agriculture productivity of individual Polish voivodeships in 2005–2012 based on the Malmquist Productivity Index. The model features the following variables: one effect (value of purchased agricultural products) and five inputs (area of agricultural land, number of people employed in agriculture, use of fertilizers, number of tractors, livestock). The study indicated that technological progress had a greater impact on the change in productivity of agriculture in Poland in the period after accession to the EU than changes in technical efficiency. Meanwhile, the highest average index of changes in MPI during the period was achieved by voivodeships: Dolnośląskie, Lubelskie, Pomorskie and Mazoweckie.
Key words: agriculture, voivodeships, efficiency, Malmquist Productivity Index

INTRODUCTION

After the accession of Poland to the European Union, Polish agriculture has been operating under different economic conditions. Participation in the European common market is tantamount to a process of aligning prices and new profit opportunities for agriculture resulting from a higher level of demand, prices and the implementation of economic support under the rules of the Common Agricultural Policy [Poczta 2008]. A number of studies [Jóźwiak 2005, Poczta 2008] indicate that the accession and related changes in economic conditions of farming operations have led to a significant improvement in the income situation of Polish agriculture. After 2004 the significance of European funds for Polish agriculture increased substantially, while the main instruments used for assisting national agriculture consisted of direct payments and the Sectoral Operational Programme [Kowalczyk 2007, Rusielik, Świtłyk 2009]. Direct payments constituted on average of 13.5% of farm income in 2004, while in 2010 this share exceeded 60% [Kruszewski, Sielska 2012].

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It should be noted, however, that the impact of integration on the monetary income of agriculture within the country is diverse, due to the fact that agriculture in different regions of the country exhibits higher or lower levels of variation. This stems mainly from the scale of production and the structure of agricultural production, as well as the different levels of marketable agricultural production [Poczta 2008].

One of the objectives of the Common Agricultural Policy is to improve the efficiency of agricultural production. It becomes, therefore, a key issue to perform ongoing monitoring and determine the direction of changes in agricultural efficiency at both the national level and for individual regions. This makes it possible to better assess the opportunities and barriers for the development of Polish agriculture on the one hand and to shape appropriate rules for the allocation of EU funds for the agricultural sector on the other [Rusielik, Świtłyk 2009, Kruszewski, Sielska 2012].

A macroeconomic approach to economic efficiency refers to how well the economy allocates scarce resources to meet the needs and demands of consumers. In turn, a microeconomic approach to efficiency is linked to individual enterprise and defined as the relation between the effects obtained by a particular decision making unit (DMU) and its input. Fried et al. [1993] refer to such a relation between effects and input as productivity, while defining efficiency as the relation between the productivity of a given entity and the maximum productivity achievable in certain technological circumstances.

In Polish literature there are many studies on the efficiency of agriculture based both on sectoral data and data for individual farms. Most of these studies are based on simple, standard efficiency indicators. There also exist efficiency analyses of farming methods based on multi-dimensional methods, inter alia, Rusielik and Świtłyk [1999], Helta and Świtłyk [2007, 2008, 2009], Prochopowicz and Rusielik [2007], Kulawik [2008], Jarzębowski [2010], Bieńkowski et al. [2012], Baran and Żak [2013], Baran [2014]. This paper also used a multi-dimensional method, i.e. the Malmquist Productivity Index, to assess changes in agricultural productivity. Studies in the field of agriculture using MPI were conducted, among others, by: Fulginiti and Perrin [1997], Brümmer et al. [2002], Helta and Świtłyk [2004], Lissitsa and Odening [2005], Rusielik and Świtłyk [2009], Świtłyk [2011].

Therefore, the purpose of this article is to determine changes in the productivity of the agricultural sector in individual voivodeships since Poland's accession to the European Union. The study aims to verify the following hypotheses:

- H1: Changes in technical efficiency were the main factor for improvements in the productivity of agriculture in Poland in 2005–2012.
- H2: Voivodeships that received the most support from EU funds per 1 ha of agricultural land observed the greatest improvement in agricultural productivity in 2005–2012.

MATERIAL AND METHODS

The study used GUS data for the period 2005–2012 on agriculture in particular voivodeships published in the Statistical Yearbooks of Agriculture and data from the reports on the activities of the Agency for Restructuring and Modernisation of Agriculture for the year 2012 as source materials.

The Malmquist Productivity Index (MPI) was employed in order to verify the research hypotheses on the basis of data for the agricultural sector in individual voivodeships. Malmquist Productivity Index is the most frequently used approach to quantification of changes in total factor productivity. MPI first introduced by Malmquist [1953] has further been studied and developed by Färe et al. [1992, 1994]. Färe et al. [1992] constructed the DEA-based MPI as the geometric mean of the two Malmquist Productivity Indices of Caves et al. [1982] – one measures the change in technical efficiency and the other measures the shift in the frontier technology. Färe et al. [1994] developed it into the output--based Malmquist productivity change index. The input-oriented Malmquist Productivity Index of a DMU can be expressed as:

$$M(y_{t+1},x_{t+1},y_t,x_t) = \left[\frac{D^t(y_{t+1},x_{t+1})}{D^t(y_t,x_t)} x \frac{D^{t+1}(y_{t+1},x_{t+1})}{D^{t+1}(y_t,x_t)}\right]^{\frac{1}{2}} \tag{1}$$

where: x_t, x_{t+1} – input vectors of dimension l at time t and $t + 1$, respectively;
y_t, y_{t+1} – corresponding k-output vectors;
D^t, D^{t+1} – an input-oriented distance function with respect to production technology at t or $t + 1$, which is defined as:

$$D(x,y) = \max\{\rho : (s/\rho) \in L(y)\} \tag{2}$$

where: $L(y)$ – number of all input vectors with which a certain output vector y can be produced, that is, $L(y) = \{x: y \text{ can be produced with } x\}$;
ρ – reciprocal value of the factor by with the total inputs could be maximally reduced without reducing output.

M measures the productivity change between periods t and $t + 1$, productivity declines, if $M < 1$, remains unchanged, if $M = 1$ and improves, if $M > 1$. The frontier technology determined by the efficient frontier is estimated using DEA for a set of DMUs. However, the frontier technology for a particular DMU under evaluation is only represented by a section of the DEA frontier or a facet. Färe et al. [1994] decomposed the MPI in eq. (1) into two terms, as shown in eq. (3), that makes it possible to measure the change of technical efficiency and the shift of the frontier in terms of a specific DMU. This implies that productivity change includes changes in technical efficiency (EFCH) as well as changes in production technology (technical change TECH):

$$M(y_{t+1},x_{t+1},y_t,x_t) = \underbrace{\frac{D^t(y_{t+1},x_{t+1})}{D^t(y_t,x_t)}}_{EFCH^{t+1}} x \left[\underbrace{\frac{D^t(y_{t+1},x_{t+1})}{D^{t+1}(y_{t+1},x_{t+1})} x \frac{D^t(y_t,x_t)}{D^{t+1}(y_t,x_t)}}_{TECH^{t+1}}\right]^{\frac{1}{2}} \tag{3}$$

The first term on the left hand side captures the change in technical efficiency (EFCH) between periods t and $t + 1$. EFCH > 1 indicates that technical efficiency change improves

while EFCH < 1 indicates efficiency change declines. The second term measures the technology frontier shift (TECH) between periods t and $t + 1$. A value of TECH > 1 indicates progress in the technology, a value of TECH < 1 indicates regress in the technology. TECH = 1 indicates no shift in technology frontier. The technical efficiency change can further be decomposed into scale efficiency change (SECH) and pure technical efficiency change (PTEC) [Färe et al. 1992].

A simple example in the case of single input and output technology is illustrated in Figure 1. The change in technical efficiency (EFCH), changes in production technology (TECH) and Malmquist Productivity Index in an input-orientation can be computed as [Cooper et al. 2007]:

$$EFCH(P) = \frac{\frac{BD}{BP_2}}{\frac{AC}{AP_1}} \tag{4}$$

$$TECH = \sqrt{\frac{AC}{AE} \cdot \frac{BF}{BD}} \tag{5}$$

$$MPI = \frac{AP_1}{BP_2}\sqrt{\frac{BF}{AC} \cdot \frac{BD}{AE}} \tag{6}$$

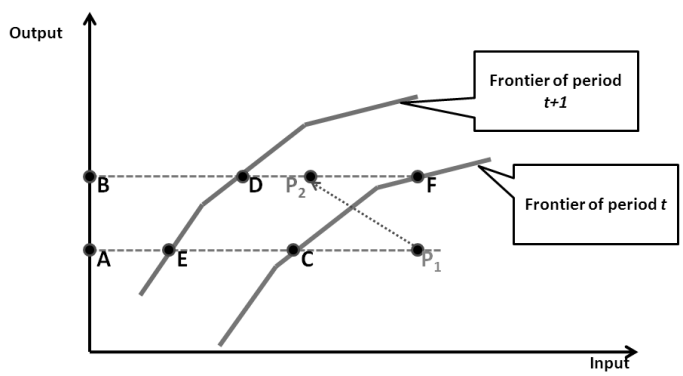

Fig. 1. The Malmquist Productivity Index
Source: Cooper et al. [2007].

RESULTS AND DISCUSSION

In order to determine factors for changes in total productivity of agricultural production in individual voivodeships, the input-oriented Malmquist Productivity Index was used. The model has been oriented to input minimisation, since in the light of current EU legislation on environmental policies and the disseminated principles of sustainable development, it is assumed that currently the only option for the development of Euro-

pean and Polish agriculture is to increase agricultural production through innovation and investment deintensification [Bieńkowski et al. 2012]. The calculated model uses the following variables:

- effect y_1 – value of purchased agricultural goods (million PLN),
- input x_1 – agricultural land area (ha),
- input x_2 – number of people employed in agriculture (people),
- input x_3 – NPK and CaO fertilization (t),
- input x_4 – number of tractors (pcs),
- input x_5 – livestock (thousands).

The average annual growth of the Malmquist Productivity Index for Polish agriculture amounted to 11% (Fig. 2) in the period covered by the study. The most significant increase in agricultural productivity was recorded between 2010 and 2011. The Malmquist Productivity Index for the period was 1.22. The increase of the MPI was influenced primarily by changes in the technology employed. The average growth of the technological change index (TECH) was 8.4% for this period. In turn, the average change of the technical efficiency index (EFCH) was 2.4% for the studied period.

In the period from 2006/2007 to 2009/2010 a visible decline in agricultural productivity in Poland has been observed and only in the period from 2010/2011 to 2011/2012 did the MPI increase to the level of 1.22 and 1.12 accordingly (Fig. 2). It can be concluded that a decrease in agricultural productivity in the first years after Poland's accession to the EU was mainly influenced by adverse changes in technical efficiency. The index for these changes (EFCH) the period from 2005/2006 to 2009/2010 fell from 1.10 to 0.99, indicating a decrease in the technical efficiency of agriculture over this period.

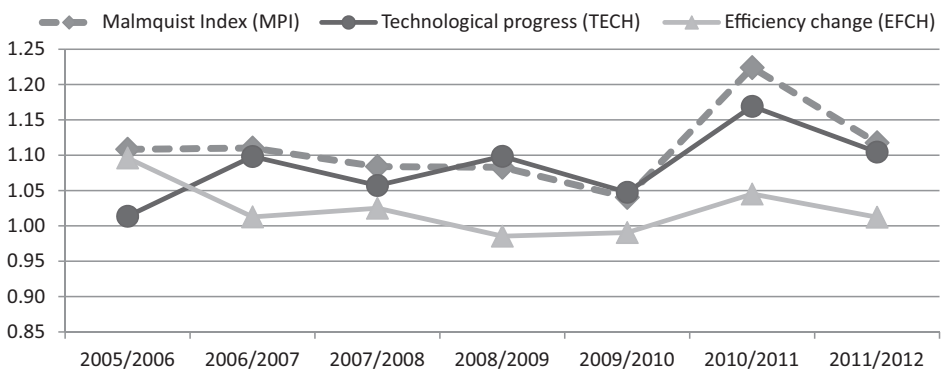

Fig. 2. Malmquist Productivity Index, changes in technical efficiency, changes in production technology calculated for agriculture in Poland

Source: Own calculations.

When analysing the average level of the Malmquist Productivity Index (MPI) in individual voivodeships one should consider that agriculture improved overall productivity over the studied period in each voivodeship. The highest average annual increase in productivity was recorded in the following voivodeships: Dolnośląskie (17%), Lubelskie (17%), Pomorskie (17%) and Mazowieckie (15%), with the lowest in Wielkopolskie (3%) and Lubuskie (2%) – Figure 3.

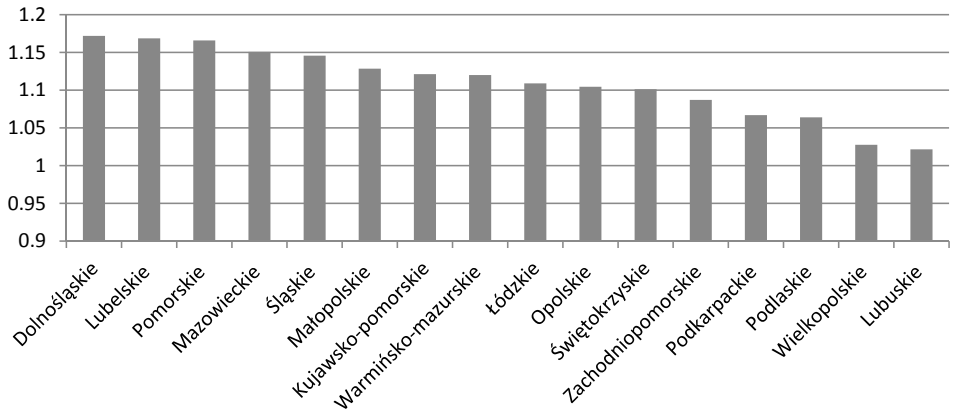

Fig. 3. Average annual Malmquist Productivity Index (MPI) calculated for voivodeships
Source: Own calculations.

Given the index of changes in technical efficiency (EFCH) for agriculture, it has been observed that only Mazowieckie Voivodeship saw an improvement in technical efficiency of agriculture throughout the entire studied period, while the other voivodeships displayed variations in this field. The highest average indices of changes in technical efficiency were recorded in the Śląskie (1.10) and Świętokrzyskie (1.10) voivodeships. In turn, the lowest (less than 1) annual average indices of changes in efficiency were observed in the Lubuskie, Łódzkie and Podlaskie voivodeships (Fig. 4).

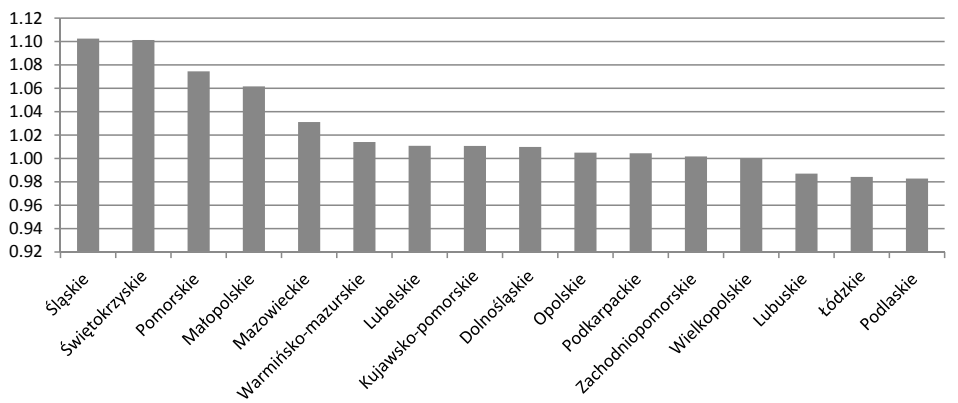

Fig. 4. Changes in technical efficiency (EFCH) for voivodeships
Source: Own calculations.

The largest average annual increases in the index of technological change (TECH) were recorded in Dolnośląskie (16%), Lubelskie (15%) and Łódzkie (13%) voivodeships. One might also assume the least significant level of technological progress was made in the Świętokrzyskie Voivodeship (Fig. 5).

In the next stage of studies it has been decided that the following question should be answered – whether the voivodeships where the greatest productivity was observed were

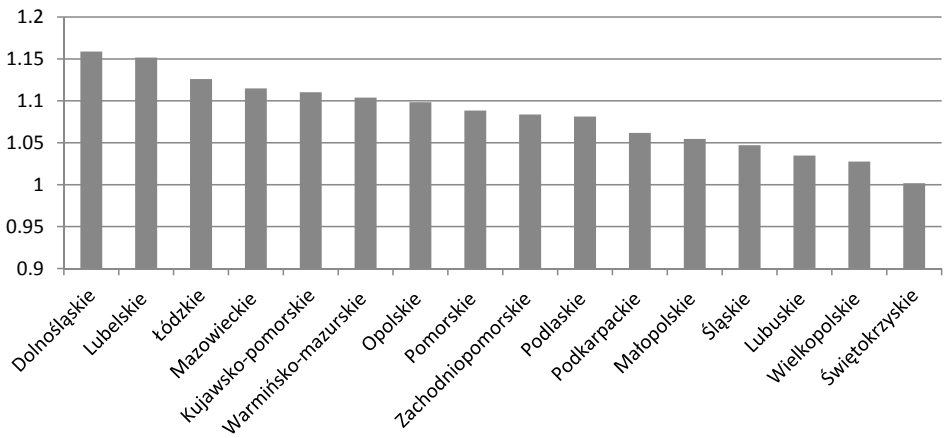

Fig. 5. Changes in production technology (TECH) for voivodeships
Source: Own calculations.

also the ones to benefit from EU funds to the furthest extent? The following EU programs were included in the flow of funds to the agricultural sector:

- Special Pre-Accession Programme for Agriculture and Rural Development (SAPARD 2004–2006),
- Sectoral Operational Programme "Restructuring and Modernisation of the Food Sector and Rural Development 2004–2006" (SOP 2004–2006),
- Rural Development Plan (RDP 2004–2006),
- Rural Development Programme (RDP 2007–2013),
- "Fruit and Vegetable Common Market Organisation" programme (FVCMO 2008),
- "Common Fisheries Policy" programme,
- direct support schemes.

The value of funds was assigned to individual voivodeships. However, given that absolute amounts should not constitute the basis for comparisons between voivodeships, the inflow of funds from the EU was calculated per 1 ha of agricultural land in individual voivodeships. The following voivodeships received EU funding per 1 ha in the period 2004–2012 in excess of the national average: Kujawsko-pomorskie, Wielkopolskie, Podlaskie, Pomorskie, Mazowieckie, Lubelskie and Łódzkie.

It can be noted that only four of the eight voivodeships, where agriculture in 2005––2012 improved its annual average productivity at a level above the national average, were also characterised in the considered period with the highest funding per 1 ha of agricultural land (Fig. 6). The other four voivodeships, despite a level of support lower than the country average per 1 ha of agricultural land, achieved in the period in question a productivity of agriculture higher than the average for the country. Meanwhile, changes in agricultural productivity in the Wielkopolskie and Podlaskie voivodeships were at a level much below the national average, despite the fact that these regions received the highest level of support from EU funds per 1 ha of agricultural land. This makes it possible to conclude that larger funds from the European Union do not translate into a higher level of agriculture productivity improvement in Polish voivodeships.

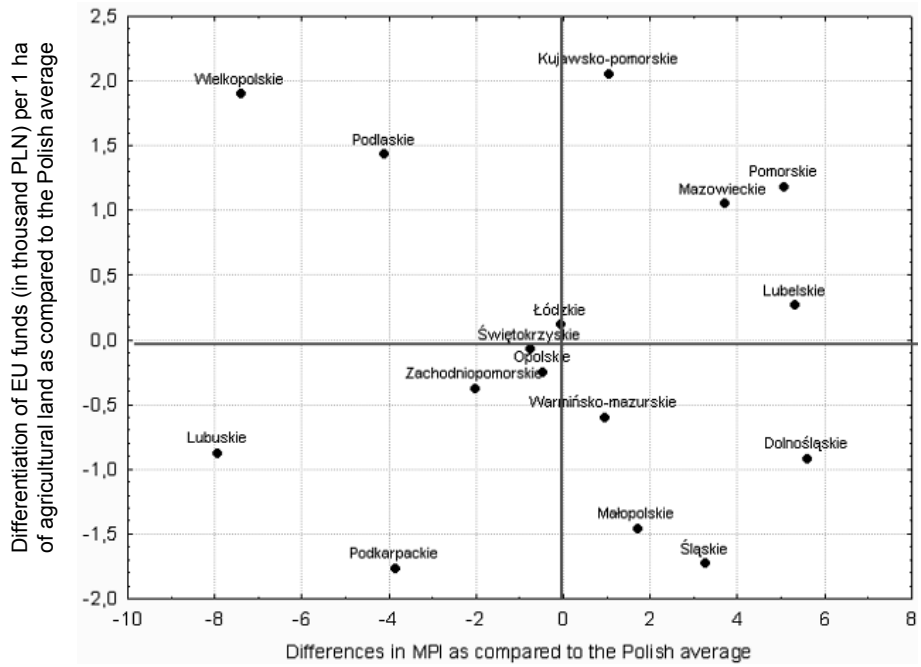

Fig. 6. Differentiation of average annual MPI and EU funds per 1 ha of agricultural land in voivodeships compared to national averages

Source: Own calculations.

It has been decided to verify the above statement by examining the correlation between the inflow of funds from the European Union per 1 ha of agricultural land and the average Malmquist Productivity Index for the individual voivodeships. The correlation coefficient was –0.07, which confirmed the previous observation that larger EU subsidies do not translate into a higher level of agricultural productivity improvement in Polish voivodeships.

CONCLUSIONS

In the article an analysis of the changes in the productivity of Polish agriculture in the 2005–2012 period was performed using the Malmquist Productivity Index. The results of the study have made it possible to indicate the general trend in the change of productivity in agriculture at the national level, as well as for individual voivodeships. The results of the analysis indicate that in 2005–2012 there was a relative increase in agricultural productivity (annual average by 11%). In all voivodeships the average MPI for 2005––2012 period was higher than 1, which indicates an increase in agricultural productivity. However, between individual periods both increases and decreases in productivity were observed. The Kujawsko-pomorskie, Lubelskie, Mazowieckie and Pomorskie voivodeships, where the MPI has not dropped below 0 throughout the analysis period, constitute

an exception. The highest annual average MPIs were seen in following voivodeships: Dolnośląskie, Lubelskie, Pomorskie and Mazowieckie.

A decomposition of calculated MPIs has made it possible to identify what factors determined the change in agricultural productivity in Poland. It was found that technological progress was the main factor influencing the change in productivity of Polish agriculture in 2005–2012. In light of the obtained results, it can be said that the current period of integration of Polish agriculture with EU structures was beneficial, because an improvement in agricultural productivity in all voivodeships occurred, but it was conditioned to a greater extent by technological progress than technical efficiency improvement – the conducted studies have therefore made it possible to reject hypothesis H1.

In addition, it was found that productivity of agriculture in voivodeships with a higher inflow of EU funds per 1 ha of agricultural land in 2005–2012 than the national average did not improve to a greater extent than regions with far less support, which allows hypothesis H2 to be rejected.

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ZMIANY PRODUKTYWNOŚCI ROLNICTWA PO AKCESJI POLSKI DO UNII EUROPEJSKIEJ

Streszczenie. W artykule bazując na indeksie produktywności Malmquista, określono zmiany produktywności rolnictwa w poszczególnych polskich województwach w latach 2005––2012. Do modelu przyjęto jako zmienne jeden efekt (wartość skupu produktów rolnych) oraz pięć nakładów (powierzchnia UR, liczba pracujących w rolnictwie, zużycie nawozów, liczba ciągników, inwentarz żywy). W ramach badań wskazano, że większy wpływ na zmianę produktywności rolnictwa w Polsce w okresie po akcesji do UE miał postęp technologiczny niż zmiana efektywności technicznej. Z kolei najwyższy średnioroczny indeks zmian MPI w badanym okresie osiągnęły województwa dolnośląskie, lubelskie, pomorskie i mazowieckie.

Słowa kluczowe: rolnictwo, województwa, efektywność, indeks produktywności Malmquista

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INNOVATIONS OF THE FOOD PRODUCTS FROM THE PERSPECTIVE OF THE GEN Y CONSUMERS

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Abstract. This article includes results of questionnaire surveys concerning behaviour of the consumers – representing Generation Y – in the process of purchase decisions concerning innovative food products. The aim of this thesis is to identify the ways of perception of innovations on the food market by a consumer of Generation Y. Conducted questionnaire surveys shows that young consumers, in a very different way, define innovations on the market of the food products, associating them, above all, with introduction of the new ways of food preservation (without preservatives, without pasteurization) and reduction of the level of unhealthy ingredients. It is worth noticing that young consumers willingly accept innovations on the food market, every third respondent declared that he/she quickly buys innovative food products, but after due consideration.

Key words: innovations, food market, consumer, Generation Y, correspondence analysis

INTRODUCTION

Innovation is a subjective category, which should be considered, both, from the point of view of a consumer and a producer because what is treated by a producer as a new one, it does not have to be treated, in the same way, by a purchaser. The aim of this thesis is to identify the ways of perception of innovations on the food market by a young consumer. The authors used, in a research, analysis of reference books and results of their own questionnaire surveys, conducted among 364 respondents, who were chosen from the group representing Generation Y, living in the regions of southern and eastern borderland of Poland. Conducted research have application values, because edited conclusions may be used by the food producers in a process of building marketing strategies.

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MATERIAL AND METHODS

Research proceedings were commenced from analyses of available secondary data – statistical data and literature within the scope of research areas. Field research commenced from conceptualization and operationalization of terms. Research was aimed at determination of potential similarities and differences of the behaviours of the Gen Y consumers towards innovations of marketing food products within the border area.

Creating standardized measuring tool required initial research, which were carried out with the application of focus method. Auditorium and internet survey was applied. Before commencement of proper research, pilot research were carried out that enabled verification of measuring tool and elimination of potential irregularities. Cronbach alpha reliability test was used for the assessment of scale reliability of measures. In our research, value between 0.748 and 0.776 was assumed, what means appropriate scale reliability [Hinton et al. 2004]. Survey was carried out in 2013 and 2014 among 364 Gen Y consumers. In research proceedings were applied only questionnaires which were classified as complete and suitable for further analysis. Attitudes of young consumers towards innovative food products were examined and diversity of the ways of perception of these products were measured. Additionally, it was verified, whether these attitudes were related to sex, professional activity (professionally active and inactive) and place of residence of a respondent (village, small city to 50 thousand inhabitants, medium city between 50–100 thousand inhabitants and large city above 100 thousand inhabitants). Statistical analysis of relations between the pairs of variables was performed using Pearson chi-square independence test. In a case when assumptions of this test were not fulfilled, its value p (p-value) was determined using Monte Carlo method. Statistical significance 0.05 was accepted. In order to examine co-occurrence of the categories of three variables, correspondence analysis and Ward method of hierarchical classification were conducted. Statistical analyses were performed using program R [R Core Team 2014].

THEORY AND BACKGROUND

Innovations on the market of food products

There are numerous attitudes towards the nature of innovations. Diversity of interpretations results from the scope of analyses, choice of approach, and also the very interpretation of novelty [Karcz 2004]. Classic definition was created by J. Schumpeter [1960], who understood innovations "as creating fundamental or radical changes, including transformation of a new idea or technological invention into market product or process". According to Oslo Manual [2005], definition of innovations includes full spectrum of novelties – novelties on a world scale, novelties on a market scale, where enterprise operates, novelties only from the point of view of a given enterprise. Aim of the innovations is to adapt organization to market environment, to increasing requirements of the clients – inside the box (innovation) – or not satisfied needs – crucial innovation [Christensen and Raynor 2008]. Innovations should be considered both from the point of view

of a consumer and a producer, because what is treated by a producer as a new one, it does not have to be treated, in the same way, by a purchaser. New product considered from the point of view of a producer is a product with new technical and technological solutions. Introduced constructional solutions, new raw materials applied, or new technology of production tell us about novelty of a product. Such a product can satisfy new needs of a consumer, it can satisfy old needs in a different way, but it is not a condition that tells us about novelty of this product [Penc 1999]. New product is any new form of a product, created as specified set of functional features, accompanying services and psychological and social features, introduced to the market. It is necessary for a new product to be considered from the perspective of a consumer, from the utility point, which is received by a recipient [Haffer 1998], therefore, a new product is the one, which satisfies new needs, or product satisfying existing needs in a new way. Thus, attitude of a consumer towards its properties decides about innovativeness of a product. Innovations should create a new value for a consumer. We should remember that goal of the innovations is not only to satisfy market needs, but also to create and satisfy them on the increasing level [Penc 1999]. Consumers on the food market are more and more demanding. Constantly changing trends on the market, shortening the cycle of life of a product, strong competition and changing lifestyle of the clients cause that consumers expect from food, not only satisfying basic needs, that is, to satisfy hunger, but they also demand to satisfy desires, that is, to shorten time for preparing meals, to be healthy or lack of interference into natural environment [Gutkowska and Ozimek 2005]. This state is becoming a factor to take actions, within the scope of development of the innovative products on the food market. Degree of innovativeness of a product is still changing, related to evolution of needs and preferences of the consumers [Sojkin et al. 2009, Barska et al. 2014]. Changes expressing the degree of novelty can refer to different dimensions of a product, therefore, they may concern its functionality, appearance or comfort of exploitation. From the point of view of the consumer, comparison of changes, features and properties of a product with his/her needs and expectations decides about innovativeness of a product, and not a specific modification.

Research of the attitudes towards new products in respect to food were conducted e.g. S.S. Ling, D.T. Pysarchik, F.J. Choo in 2004, X. McCarthy, Y. O'Sullivan, Z. O'Reilly in 1999, and H.J. Choo, J.-E. Chung, D.T. Pysarchik in 2004 [Kowalczuk 2011], whereas among Polish, researches were conducted e.g. K. Gutkowska and I. Ozimek [2005], B. Sojkin, M. Małecka, T. Olejniczak and M. Bakalarska [2009], Kowalczuk [2011], E. Babicz-Zielińska, M. Jeżewska-Zychowicz and M. Trańska [2013]. The presented results suggest connection between innovativeness of the consumers and their social and demographic features [Matysiak-Pejsa 2008, Sojkin et al. 2009], there are researches available, in which such no such dependencies were indicated in case of some features. However, conducted query of the literature enables us to notice that results, presented in the literature, do not concern consumers of Generation Y. Examining this phenomenon is difficult, due to complexity of attitudes and reactions of consumers to novelty, and also their subjectivity in defining novelty, however, they have application values.

Consumer of Generation Y on the market

Generation Y, also called Millennium generation, is a relatively new definition. It comes from the United States, where scientists described in 1993 this separate social group. It is a definition of the generation of which representatives were born in last two decades of the twentieth century [Berreby 1999]. According to Strauss and Howe's taxonomy of generation, representatives of Millennium generation are people who were born after 1982, who were growing up in the times of fast economic growth. In Poland, people who belong to this generation were born in the last years of socialism. People who were born after 1986 are often qualified to this group. They know socialism only from the stories of the elderly. Unlike their parents, they were growing up in a period of economic growth. Representatives of Millennium generation were growing up in the world of globalization, tolerance and acceptance of individuality. Jean Twenge [2007] calls this generation ("Generation Me") – due to their self-confidence and focus on their own needs. The years, in which representatives of Generation Y were born, is also a period of technological development. Internet and wireless ways of communication with the world, allow Generation Y having easy access to unlimited information from the whole world. It is a first generation, who were growing up in homes with computers and had an access to digital media. Internet as a channel of communication has become the most significant for Generation Y [Kotler and Armstrong 2008]. In the network, they communicate with acquaintances, gain knowledge, write blogs and, more and more often, buy things there. Generation Y consumers were growing up in a specific community, who had an influence on values, by which they are directed now and expectations they have towards reality around them. According to M. Males [1996], representatives of Generation Y are distinguished by: higher awareness of their value as purchasers, they know what they want and have limited loyalty. They are characterized as optimists, tolerant, open to the world, they value independence and individuality [Anders 2014].

Representatives of Generation Y were growing up in a specific community, what may have serious impact on their purchasing attitude. Marketing managers must understand behaviour of the consumers of Generation Y, in order to effectively occur in this segment and develop innovations, the most desirable by these users [Keith 2011].

RESULTS AND DISCUSSION

Research was carried out among 364 consumers, women were 55% of the respondents, whereas men were 44% of the respondents, 1% of the respondents did not reveal their sex. Research has shown that the most numerous group were respondents, who declared that they quickly buy innovative food products, but after due consideration (these consumers are called early imitators), every third respondent answered in this way. Every fourth respondent declared that he/she buys innovative food products after they have been tried by the acquaintances and family (they are the group of the so-called early majority), whereas every fifth respondent buys innovative food products, when most of their acquaintances bought and recommended these products (so-called late majority). Reluctance to new food products and preferring to buy favourite known products was

declared by 16.7% of the respondents. They are the so-called marauders. Belonging to the group of innovators, that is, inclination to buy innovative food products, soon after they are on sale, was declared by about 4.5% of the respondents. In the group of young consumers, share of innovators is much higher than in a Rogers model [1983] concerning the whole population, what may prove that adaptation of innovations on the food market, depends on the age [Barska 2014]. Young consumers much quicker accept innovations on the food market, although, on this market, purchasing conservatism often occurs. It is also confirmed by other researchers [Sojkin et al. 2009, Barska et al. 2014]. Consumers are aware of changes occurring on the Polish food market and perceive new products on this market. Some of these products are perceived positively, especially those, which contain pro-health substances. They expect naturalness and freshness from food, as basic attributes of its quality [Gutkowska 2011].

Arrangement of attitudes towards innovations on the food market among respondents was distinguished into following features: sex (woman and man), professional activity (active and inactive) and place of residence (village, small, medium and large city) – Figure 1. As we can see, in the group of men, share of innovators was outnumbered by over two to one, and representatives of marauders are almost twice as big as in the group of women. More openness towards innovative solutions in the food sphere may result from the fact that women more often buy food products and they have wider knowledge within this scope. It is worth noticing that among inhabitants of rural areas, representatives of the group of innovators were not identified. It is visible that arrangement of attitudes towards innovations in the group of professionally active and inactive people is similar. The attitude towards innovations is much more determined by sex and place of residence than professional activity (V-Cramer coefficient value were respectively: 0.16, 0.12 and 0.07). However, chi-square independence test did not show statistically significant relations between considered features of the respondents and their attitude towards new food products.

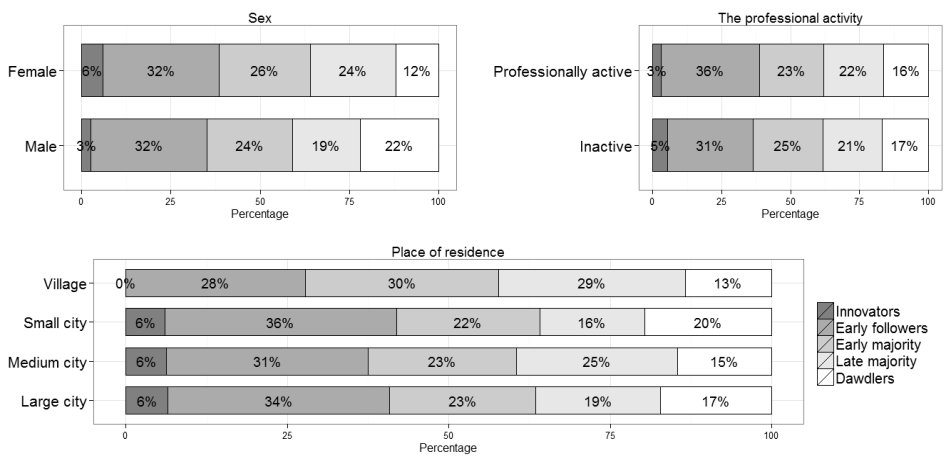

Fig. 1. Diffusion of innovative food products among consumers of Generation Y depending on their sex, place of residence and professional activity

Source: Own research and calculations (by R 3.1.0).

Researches show that innovations on the food market is a subjective category. Young consumers associate them, above all, with introduction of the new ways of food preservation (without preservatives, without pasteurization). It was declared by 72% of the respondents and reduction of the level of unhealthy ingredients, was declared by 70% respondents. Almost seven out of ten agreed that innovation in a food product means to introduce innovative food products with a new taste, consistency, form. Change of packaging into ecological as an innovation, within the scope of a product on the food market, is treated by 66% of the respondents. It is worth noticing that small percentage of the respondents treats change of packaging and brand as an innovation. The highest polarization of opinions of the respondents concerned perception, by them, innovativeness of the products as a change of their brand: 25% of the respondents answered "yes" and 31% answered "no". Whereas, the highest percentage of undecided (50%) was among those who understand this innovativeness as change of basis weight of innovative food products. Therefore, results prove that innovations, consumers perceive, above all, through prism of new values created by them for a recipient (Fig. 2).

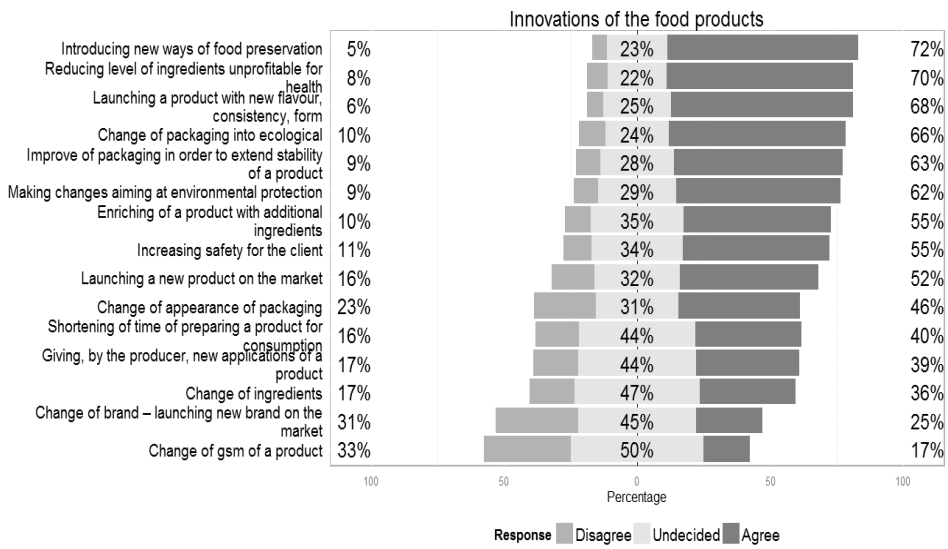

Fig. 2. The ways of perception – among consumers of Generation Y – innovative food products
Source: Own research and calculations (by R 3.1.0).

Analysing the role of sex in perception of innovations, we should pay attention to the fact that there was found a statistical dependence between sex and following actions: change of packaging (new shape, new colours – $\chi^2 = 23.12$, $p < 0.0001$); change of packaging into ecological ($\chi^2 = 8.44$, $p = 0.0147$); change of brand – introduction of a new brand to the market ($\chi^2 = 12.64$, $p = 0.0018$) and introduction of the new ways of food preservation (without preservatives, without pasteurization – $\chi^2 = 6.93$, $p = 0.0312$). In all these cases, women more often recognized these solutions as an innovation, whereas, the highest conformity between women (77%) and men (66%) concerned accepting as innovative products, those with a new way of food preservation (Fig. 3). Whereas, the

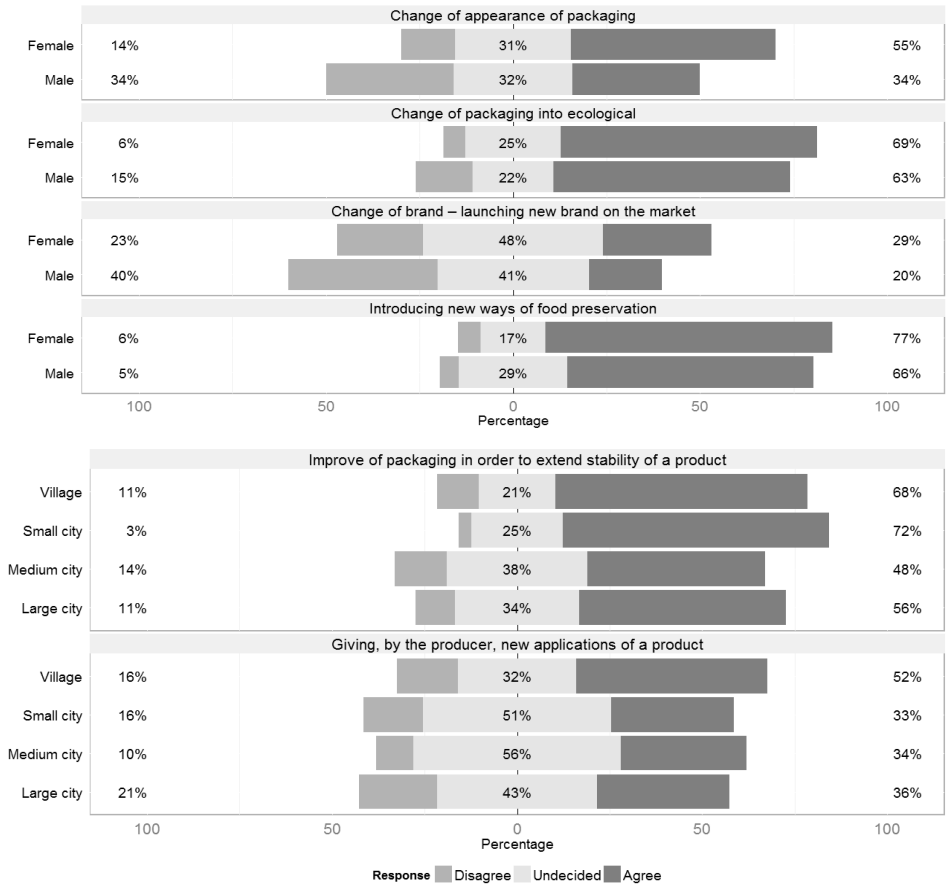

Fig. 3. The ways of perception – among consumers of Generation Y – innovative food products depending on sex and place of residence
Source: Own research and calculations (by R 3.1.0).

highest polarization of opinions, especially among men, concerned perception of innovations through change of packaging of a food product.

Place of residence of a young respondent, in a statistically significant way, determined the level of perception of innovativeness of the food products as related to improvement of packaging, in order to extend durability of a product ($\chi^2 = 16.19$, $p = 0.0128$) and its new applications ($\chi^2 = 14.06$, $p = 0.029$) – Figure 3. In the first case, percentage of the respondents living in the village (68%) was comparable with those living in the small city to 50 thousand inhabitants (72%), who agree witch such comprehension of innovativeness. People living in the village recognized the innovativeness product by giving, by a producer, its new applications (52%), whereas among inhabitants of large cities, above 100 thousand inhabitants, there was the highest polarization of this opinion.

In order to determine relations between categories of answers of three variables: diffusion of innovations, professional activity and place of residence, correspondence analysis

was performed (Fig. 4). Due to the fact that the group of the innovators was a small percentage of the respondents (4.5%), co-occurrence analysis was performed without this group of young people. It is confirmed that, among people from small cities (to 50 thousand inhabitants), attitude of marauders towards innovations of the food products dominated and it is clearly seen that people from large cities (above 100 thousand inhabitants) are professionally active. On the other hand, people professionally inactive are strong group of people with an attitude of the early majority group towards innovations, living in the village or in the city from 50 to 100 thousand inhabitants.

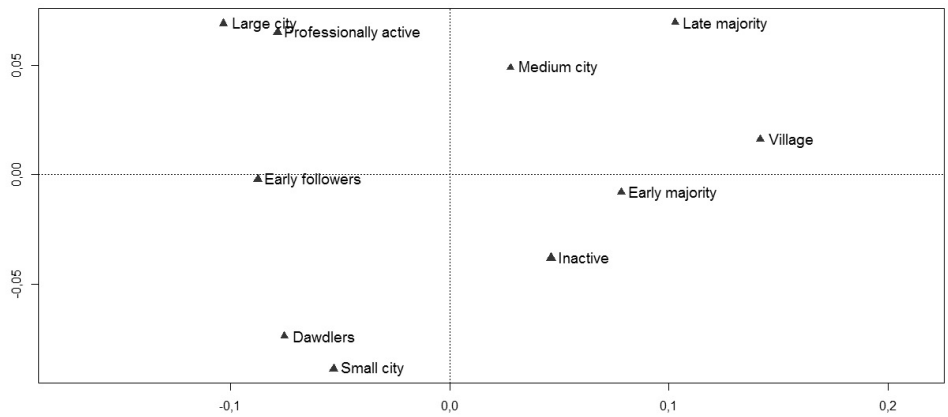

Fig. 4. Graphical presentation of results of correspondence analysis for concurrent occurrences of categories of variables: diffusion of innovations (excluding the group of innovators), professional activity and place of residence. Dimension 1 explains 54.8% of total inertia, dimension 2–23.0% of this inertia

Source: Own research and calculations (by R 3.1.0).

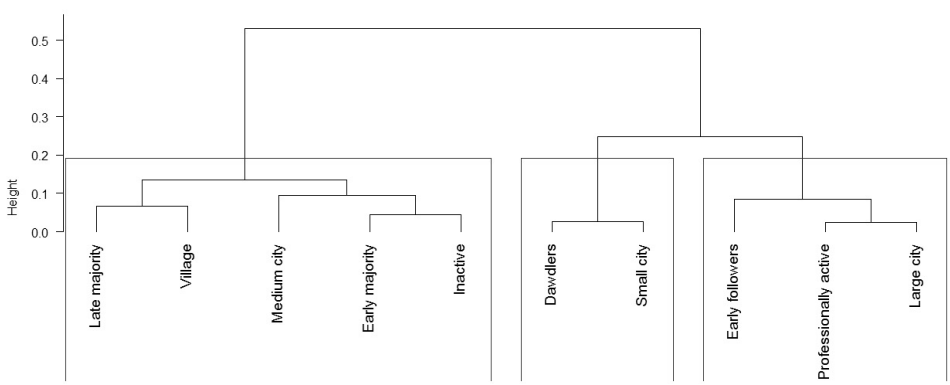

Fig. 5. Clustering dendrogram using Ward method of the categories of features: diffusion of innovations (excluding the group of innovators), professional activity and place of residence. Value of silhouette index at 3 concentrations is 0.54.

Source: Own research and calculations (by R 3.1.0).

Additionally, analysis of relations of versions of variables was conducted using Ward method of hierarchical classification (Fig. 5). Division of the respondents (excluding the group of innovators) into three classes generally confirms conclusions coming from correspondence analysis. It is confirmed that examined group of inhabitants of the small cities are the people with sceptical attitude towards innovations on the food market. Moreover, the profiles of the people, living in the village and in the city, between 50 to 100 thousand inhabitants, are similar. People with attitudes towards innovations on the food market described as early majority and late majority dominate there. The third group create representatives of the early imitators group, that is, people who are professionally active and live in a large city.

CONCLUSIONS

Research of perception – among consumers of Generation Y – of the product innovations on the food market show that modern market is "flooded" with a large number of different food articles and consumer gets "confused" which product is innovative, and which one is not. Results of research have proven that young consumers are open to novelties, but they also make heavy demands on the food producers. They are aware consumers and they know very well what they expect from a new product. Innovative products, for the examined group, are those that bring new value, what should become a determinant for marketing activities addressed to this group. The consumers of Generation Y associate a new product, above all, with introduction of the new ways of food preservation (without preservatives, without pasteurization) and reduction of the level of ingredients unfavourable for health, what suggest innovations related to health-improving changes of a product. It is important to note that innovative products are those which bring new value. Knowledge of attitudes of the consumers of Generation Y towards innovations on the food market, gives producers not only measurable benefits, but it can also favour faster diffusion of innovative solutions, due to the fact that young consumers play many different roles in the decision-making process related to purchase of food: gaining information, initiating purchase, advisor or also purchaser. The realized researches show a relation between innovativeness of the consumers and their social and demographic features. It is noted that attitude towards innovations is much more determined by sex than professional activity. Place of residence of a young respondent, in a statistically significant way, determined the degree of comprehension by them the innovativeness of the food products.

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INNOWACJE PRODUKTÓW ŻYWNOŚCIOWYCH Z PERSPEKTYWY KONSUMENTA GENERACJI Y

Streszczenie. W niniejszym artykule zostały zaprezentowane wyniki badań ankietowych dotyczących zachowań konsumentów – reprezentujących generację Y – w procesie decyzji zakupowych dotyczących innowacyjnych produktów żywnościowych. Celem niniejszego

artykułu jest identyfikacja sposobów postrzegania innowacji na rynku żywności przez konsumenta generacji Y. Z przeprowadzonych badań ankietowych wynika, że młodzi konsumenci w bardzo różny sposób definiują innowacje na rynku produktów żywnościowych, kojarząc je przed wszystkim z wprowadzaniem nowych sposobów utrwalania żywności (bez konserwantów, bez pasteryzacji) oraz zmniejszeniem poziomu składników niekorzystnych dla zdrowia. Warto zauważyć, że młodzi konsumenci chętnie akceptują innowacje na rynku żywności, co trzeci badany zadeklarował, że kupuje innowacyjne produkty żywnościowe szybko, ale po uprzednim namyśle.

Słowa kluczowe: innowacje, rynek żywności, konsument, generacja Y, analiza korespondencji

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DIRECT PAYMENTS IN THE LIGHT OF THE COMMON AGRICULTURAL POLICY (CAP) REGULATIONS FOR THE PERIOD 2014–2020

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Abstract. The article presents the assessment of the changes in the system of direct payments as an instrument of the EU Common Agricultural Policy in the new financial perspective for 2014–2020. The level of financing under the Common Agricultural Policy in historical context was described as well as the level of spendings on direct payments was stated. The changes in the payment system were reviewed by referring to differentiations in the mechanism applied by Member States. The article presents the arguments and evidence that the new payment solutions continue to be inconsistent and many regulations in terms of their scope are left to the discretion of individual member states. The novelty in the current financial perspective is to define a farmer who is professionally active, creating the possibility of shifting part of the funds from the payment system to the rural areas and vice versa as well as to introduce the new rules relating to the environmental requirements on the farm.

Key words: common agricultural policy, direct payments, the 2014–2020 financial perspective

INTRODUCTION

The Common Agricultural Policy is one of the most important Community policies of the European Union. Legitimacy derives from Art. 38 of the Treaty on the Functioning of the Community in which the Union determines and is committed to the implementation of the Common Agricultural Policy [TFEU 2010]. Therefore, it can be concluded that the provisions of the Treaty on the Functioning of the EU trigger the treaty related budgetary commitments although that document does not specify the level of support for agriculture and the development of rural areas [Pietras 2008]. The community nature of the policy is visible first of all, in setting uniform targets, principles of this policy and the instruments having an impact on the agriculture. It should be noted, however, that in determining the

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measures serving the implementation of the Common Agricultural Policy, it is taken into account the special nature of the agricultural production, which results from the social structure of agriculture as well as from the structural and natural differences between the agricultural regions [Art. 39 TFEU]. The importance of the Common Agricultural Policy also highlights the amount of support from the EU budget, which still accounts for a significant proportion of expenditure (about 41% in the year 2013). Although the functions of agriculture and rural areas, including the objectives of the Common Agricultural Policy have evolved historically from the late 50s of the twentieth century to the present time, it still remains an important area of the activity of the European Union and thus it is the focus of researchers' attention and subject of numerous studies and analyses [Biernat-Jarka 2012]. The reforms in the field of this policy are a consequence on the one hand, of the internal pressures resulting from the expectations of the member states and on the other hand, of the trade negotiations undertaken on the international forum [Swinnen 2008, Cunha and Swinbank 2009). It is an example of the intervention policy of the European Union, in which case the arguments are sought to justify its use. Many economists believe that government intervention is needed, but the state has limitations and therefore it should intervene only there where there is the biggest market failure [Stiglitz 2004]. The main reasons for the application of the intervention measures, the so-called traditional measures, the economists assign to, among others, market failure, the presence of the public goods, the existence of the external effects or the existence of goods favourable or unfavourable from the perspective of the society [Wojtyna 1990, Milewski 2002, Stiglitz 2004]. These arguments can be directly applied to agriculture where the need for the protection of the natural environment or the provision of public goods has become a major justification for maintaining the intervention policy applied by EU [Buckwell 2007, Bureau and Mahé 2008, Rembisz 2010].

During 50 years of its operation, the CAP programme was transformed from the price supporting policy directly linked to the agricultural production into the policy of supporting agricultural revenues, but without linking it to the size of production [Biernat-Jarka 2012]. The major changes in the EU agricultural policy were introduced under Mac Shary's reform, after the enactment of which the system of effective direct payments came into force, undergoing many changes during subsequent reforms [Erjaven et al. 2011].

The current financial perspective of the EU budget introduces new rules concerning the use of the funds under the direct payment programmes. On the one hand, the payments remain the biggest financial instrument under the CAP programme, but on the other hand there are still many questions about the legitimacy of their use.

The main purpose of the debate presented in this article is to discuss and assess the changes in the system of direct payments as a support for farms in the years 2014–2020. The author describes the importance of payments in the EU intervention policy, determines the amount of expenditure for payments and points out the weaknesses of the existing system. The recent changes in the system of direct payments have not solved many problems and raise doubts arising from different levels of farm support in various countries of the European Union as well as from different ways of reaching the equalised level of subsidies.

The evaluation of the system of direct payments contained in this report was prepared on the basis of the government documents, the EU Council Regulation, official studies and reports of the European Commission.

DISCUSSION AND RESULTS

The level of financing the Common Agricultural Policy

The expenditures on the Common Agricultural Policy since the beginnings of integration were a dominant position in the EU budget (see Table 1). At present, CAP still continues to be one of the most costly policies (except for the cohesion policy). In the year 2013, the expenditures on the Common Agricultural Policy amounted to approximately 41% of the total EU budget.

Table 1. The expenditures on the Common Agricultural Policy from the EU budget in the years 1968–2013[a]

Year	Payments from EAGGF (guarantee section)	Payments from EAGGF (guidance section)	Total budget of CAP programme	Percentage share of expenditure on CAP programme in the total budget (%)
1968	1 259.7	34.0	1 293.7	86.9
1970	3 108.1	58.4	3 166.5	93.5
1975	4 327.7	76.7	4 404.4	75.7
1980	11 294.9	314.6	11 606.5	73.2
1985	19 727.8	685.5	20 413.3	73.2
1990	25 604.6	1 825.3	27 429.9	62.2
2005	48 346.8	2 943.3	51 290.1	49.3
×	Payments from EFRG	Payments from EFRROW	×	×
2010	43 690	11 493	55 183	45.8
2013	45 305	14 451	59 756	41.4

[a]From 1968 to 1978 in millions of settlement units, since 1978 in ECU, after 2000 in EUR. By the end of the year 2006, the spendings on the Common Agricultural Policy were covered from the European Agricultural Guidance and the Guarantee Fund (EAGGF) (Guarantee section), while from the 1 January 2007 these expenditures are financed from the European Agricultural Guarantee Fund (EAGF).
Source: Adinolfi F., Little J., Massot A. The Cap in the Multiannual Financial Framework 2014–2020. General Directorate for the Internal Policy, Thematic Department B, Structural and Cohesion Policy. European Parliament, Brussels 2011.

Having analysed profoundly the expenditures within CAP programme in the year 2012 it shall be noted that the biggest item of expenditures from the European Agricultural Guarantee Fund was direct payments (91%) [Report of the Commission of 2013] – Figure 1.

Other expenses for the storage of the basic agricultural products (butter and olive oil), export refunds (beef, poultry, pork, eggs), other market instruments (food programs) and the so-called centralized direct expenses (veterinary and phytosanitary measures, the accounting of the farming households, CAP information campaigns) amounted to about

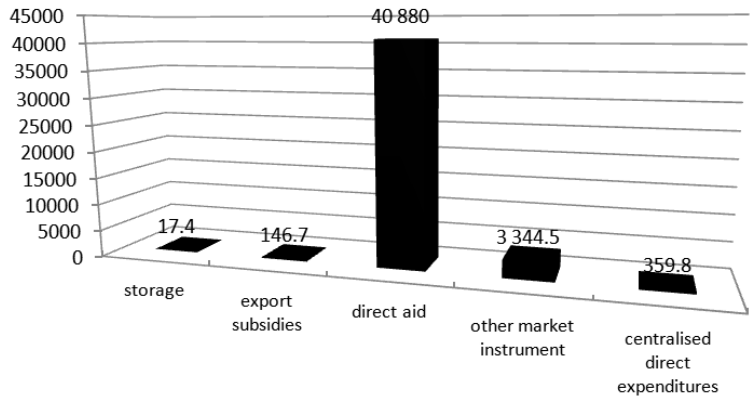

Fig. 1. Expenditures from the European Agricultural Guarantee Fund in the year 2012 (in thousand EUR)

Source: The Report of the Commission for the European Parliament and the European Council. 6th Financial Report of the Commission for the European Parliament and of the Council on the implementation of the European Agricultural Guarantee Fund (EAGF), the financial year 2012. European Commission, Brussels, 26.09.2013.

10% of the total expenditure of the European Agricultural Guarantee Fund. This situation confirms the Commission's efforts to support directly the income of the farm producers while reducing the market mechanisms which are in use [Marcysiak and Marcysiak 2013].

The use of the direct payments systems in the EU raises many questions, not only because of the considerable burden on the budget (over 30% of the expenditures on direct payments in the total budget), but also due to the fact that 80% of beneficiaries still receive about 20% of the total amount of direct payments (in Bulgaria and Romania 88%) [Report of the distribution in 2013]. Therefore, we can ask a question who this system is destined for, certainly not for small farms which receive the least amounts from the payments. It can rather be said that the current justification for payments is the compensation for agriculture for the provision of public goods. As a result of those changes, mostly of structural nature, since the year 2005 the number of farms receiving direct payments from the EU has declined by 10% in the 15 old EU countries and by 6% in other 10 EU countries. The decrease in the number of beneficiaries affected in the slightest degree, Bulgaria and Romania which experienced the decline by 3% [Report of the distribution in 2013].

Still, the biggest problem in the field of direct payments is their differentiation between Member States. Achieving the same level of payments will not be possible also in the current financial perspective, but the aim of the Commission is to strive to close the gap in the support for farms in different Member States.

It should be emphasized that in the year 2012, in 10 new Member States, 93% of beneficiaries received payments of up to 5 thousand EUR (in Bulgaria that situation affected 98% of farms) – see Table 2. On the other hand, the average amount of payments per beneficiary in 27 EU countries fluctuated around 5.5 thousand EUR while in the 15 old Member States of the Community amounted to 7.8 thousand EUR.

Table 2. Beneficiaries of direct payments in the year 2012

Specification		EU-15	EU-10	Bulgaria and Romania	EU-27
Number of beneficiaries (in thousands)		4 397	1 913	1 199	7 510
The average amount of payments per beneficiary (in EUR)		7 805	2 753	1 079	5 444
Receiving 5 thousand EUR or less	% beneficiaries	69	93	98	80
	% amount of direct payments	12	37	35	16

Source: Report on the distribution of direct aids to the agricultural producers (Financial Year 2012). European Commission, November 2013.

Changes in direct payments system in the years 2014–2020

The system of direct payments in the current financial perspective remains the most important instrument of financial support. In the years 2014–2020 and especially from the year 2015 (the year 2014 was considered as a transition year) many issues concerning this system remain unchanged, but in some cases, the solutions were introduced which so far have not been used.

The new regulation introduced in the reform is the definition of the professionally active farmer, which is directly associated with the definition of the beneficiary of payments. The professionally active farmer is a person whose annual amount of payment represents at least 5% of the revenues from non-farming activities generated in the last operating year. Besides, the farming activity cannot be marginal. The above definition does not apply to farmers who in the previous financial year received payments not exceeding a certain amount fixed by the Member States and not higher than 5 thousand EUR. At this point, a question can be asked what level of payments will be adopted by Member States and in connection with this, which group of beneficiaries will not have to meet the criterion of an professionally active producer in order to receive direct payments. In Poland about 95% beneficiaries receive payments up to 5 thousand EUR per year and they constitute a population of 1,281 thousand beneficiaries.

In addition, the new regulation in the current financial perspective, which organizes the issue of determining the group of beneficiaries of the payments is the exclusion from the subside payments, of the natural and legal persons administering the airports, water pipelines as well as recreational and sports grounds or providing railway carriage services or services in the field of real estate trading. The Commission also gives the possibility to the Member States to complete the list of non-agricultural enterprises, which should not participate in the payment system and should not benefit from it.

In order to reduce the financial burden associated with the management system of direct payments, according to the Commission, the Member States should refrain from granting payments when the payment amount is less than 100 EUR or when the minimum area eligible for support is less than one hectare [Art. 10 of the Regulation]. In the

Member States where the agriculture is fragmented and significantly differs from the average structure of agriculture in the EU (the outermost regions and the Aegean islands[1]), the Member States may decide to waive the minimum payment threshold. This is justified by socio-economic situation of those regions (insularity, small size, difficult topography

Table 3. Minimum limits defining the so-called thresholds for the granting of direct payments

Member States	Threshold limit (in EUR)	Threshold limit (in ha)	Member States	Threshold limit (in EUR)	Threshold limit (in ha)
Belgium	400	2	Lithuania	100	1
Bulgaria	200	0.5	Luxemburg	300	4
Czech Republic	200	5	Hungary	200	0.3
Denmark	300	5	Malta	500	0.1
Germany	300	4	Netherlands	500	2
Estonia	100	3	Austria	200	2
Ireland	200	3	Poland	200	0.5
Greece	400	0.4	Portugal	200	0.3
Spain	300	2	Romania	200	0.3
France	300	4	Slovenia	300	0.3
Croatia	100	1	Slovakia	200	2
Italy	400	0.5	Finland	200	3
Cyprus	300	0.3	Sweden	200	4
Latvia	100	1	United Kingdom	200	5

Source: Annex IV, Regulation of the European Parliament and of the Council (EU) No 1307/2013 of the 17 December 2013 laying down the rules regarding the direct payments to farmers on the basis of the support schemes under the common agricultural policy and repealing the Council Regulation (EC) No 637/2008 and the Council Regulation (EC) No 73/2009.

and climate, their economic dependence on a few products). The thresholds of minimum support are set out in Table 3.

The issue discussed for many years, which was reflected in the Regulation [Regulation of 2013] was the issue of lowering the direct payments to farmers obtaining the highest support. The Member States were obliged to reduce the payments which are paid out in respect of the part of the amount in excess of 150 thousand EUR. The lowering of the payments must be at least 5% above this amount. Potentially, the lowering of the payments may relate in 27 Member States to around 15 thousand farm households, while in Poland to only 510 (this is the group receiving over 150 thousand EUR of aid per year).

In turn, a novelty in the current programming period is the possibility of deducting from the direct payments received by farmers, the wages related to the employment of workers, including taxes and social security contributions. The basis of the deduction will be the amount of the declared and actual benefits paid in the previous calendar year. The funds obtained as a result of lowering the payments for big beneficiaries shall stay in the Member States where they were saved and should be made available under the European Agricultural Fund for Rural Development (EAFRD). Where it becomes necessary to re-

[1]Guadeloupe, French Guiana, Martinique, Réunion, Saint-Barthélemy, Saint-Martin, the Azores, Madeira and the Canary Islands.

duce the total amount allocated for payment, e.g. because the estimated payments will be higher than the available budget for the first pillar of CAP, the reduction in annual payments shall not refer to beneficiaries receiving less than 2 thousand EUR per year.

The Member States may also decide to shift up to 15% of the funds earmarked for the direct payments directly to the Rural Areas Development Programme. The decision in this regard concerning the years 2015–2019 shall be taken by the 1 August 2014. There is also a possibility of shifting the funds for the pay-out of the direct payments from the European Agricultural Fund for Rural Development (up to 15% of the Fund) in the case of countries such as Bulgaria, Estonia, Spain, Lithuania, Latvia, Poland, Portugal, Slovakia, Finland, Sweden and the United Kingdom up to 25% of the funds.

Still, the big problem in the European Union is to differentiate the amount of direct payments per 1 ha of arable land (UR). While in Greece they accounted on average in the year 2013 for more than 500 EUR per 1 ha, in Malta, in the Netherlands and Belgium for more than 450 whereas in countries such as Latvia, Romania or Estonia it was about 100 EUR per 1 ha, but in Poland a little over 200 EUR per 1 ha [Baldock 2010]. Therefore, in the Member States in which the direct payments are below 90% of the EU average, the difference between the current level and this level of payments should be reduced by one-third. An important assumption is that by 2019 each farmer will receive payment of not less than 60% of the national or regional unit value. The alignment of payments should be financed proportionally by all Member States in which the level of direct payments exceeds the EU average (in the year 2013 it accounted for approximately 350 EUR per 1 ha).

The eligibility condition of the farms' farmland to receive direct payments in Poland and in the countries that joined the EU on the 1 May 2004 was maintaining the land in good farming culture. In the current 2014–2020 financial perspective the new regulation is the possibility of obtaining payments also for the farming land, which on the 1 June 2003 was not maintained in a good agricultural condition. Another extremely important issue is to run the non-agricultural activities on the farm and the question of whether such agricultural land of the farm is eligible for payment or not. Due to the fact that non-agricultural activities are highly desirable in the rural areas since it contributes to the diversification of farms' incomes and to the vitality of the rural areas, in the Commission's opinion the farmland of the farms used for non-agricultural activities should also be covered by payments provided that the farmland is used to greater extent for agricultural activity. The question arises on how to determine this proportion and what it has to mean? Therefore, Member States were required to identify common criteria for determining that overwhelming share and should prepare a list of areas not eligible for support.

As defined in the Regulation [Regulation of 2013] one of the most important objectives of the reform of the Common Agricultural Policy is to reduce the administrative costs of the system. It should be considered whether the new regulations regarding the direct payments will actually contribute to the simplification of the system of support, will become more clear and understandable for the beneficiaries and at the same time will require fewer administrative checks. A large part of the regulations is left to the discretion of the Member States, which on the one hand, takes into account the diversity of countries entering the European Union and on the other hand creates a number of solutions impact-

ing further differentiation of the system. The Member States applying the uniform area payment system in the year 2014, including Poland, may extend its validity until 2020.

Environmental activities in the framework of the Common Agricultural Policy

One of the objectives of the reform of the Common Agricultural Policy is to improve the impact of the agricultural activities on the natural environment. Therefore, all the farms benefiting from the payments are required to comply with the agricultural practices beneficial for the climate and the natural environment or the so-called equivalent practices. These actions may involve the crop diversification, the maintenance of permanent grasslands, including the traditional orchards, which with low density cover the area of permanent grassland and the maintenance of pro-ecological areas on the farmland.

Crop diversification means that if the farm covers an area of 10 to 30 ha, at least two plants must be cultivated. The main crop shall not represent more than 75% of the land area. On the farm with an area of more than 30 ha, at least three different crops shall be grown, the main crop shall represent not more than 75% of the area and together the two crops cannot occupy more than 95% of that land. The above rules do not apply to farms where grass or other herbaceous forage crops or fallow land occupy more than 75% of the arable land. In turn, the pro-ecological areas may consist of fallow land, buffer zones, forested areas, agricultural and forest areas but also it must be remembered to use the intercrops or winter green cover. It is also possible to use the so-called equivalent practices that result in equivalent or greater level of benefits for the climate and the environment. The list of practices equivalent to the diversification of crops is provided in Annex IX of the Regulation [Regulation of 2013]. In order to finance the payments for the keeping of the pro-ecological area, the Member States use 30% of the annual national ceiling allocated to payments [Annex II of the Regulation of 2013].

The Member States may grant payments to the farmers eligible for the area payments or the uniform area payments due to areas with natural constraints. In order to finance the payments for areas with natural constraints, the Member States may decide by the 1 August 2014 to use up to 5% of the ceiling allocated to direct payments.

Besides, the additional payment can also be paid out to the young farmers who for the first time start farming activity or who started operations not earlier than 5 years before the submission of the application. The young farmers are the persons who are still under 40 years of age. The payment for the young farmer shall be granted for a maximum period of 5 years, this period can be reduced by the number of years between starting a business activity and the first submission of the application. The Member States may allocate not more than 2% of the annual ceiling on direct payments to young farmers

A separate issue is the support related to production. This support may be granted only to those sectors or to those regions of the Member State in which certain types of farming or sectors are particularly important for economic, social or environmental reasons. The support related to the production shall be granted only to the extent that is necessary for encouraging the producers in the given region to maintain the current levels of production. Within the support linked to the production, up to 8% of the annual ceiling on payments can be used.

Another new instrument is the payment for small farms. The farmers participating in the system for small farms are exempt from farming practices. The farmers interested in this system shall submit an application within the period specified in the Member State, not later than by the 15 October 2015. The annual figure for farmers participating in the scheme for small farms is calculated as 25% of the national average payment per beneficiary, determined on the basis of the national ceiling and the number of farmers who declared the eligible areas or the amount corresponding to the national average payment multiplied by the number of corresponding hectares (maximum 5). The support for small farms can range from 500 to 1,250 EUR. According to Musiał [2010], Musiał and Wojewodzic [2011], in the system of small-scale farm support it is extremely vital to the use the identical instruments in all Member States and the appropriate level of the transferred funds. The granting of direct payments based on the acreage or production is more reasonable than the complicated instrumental system of budgetary transfers, which has to connect simultaneously multiple objectives of the CAP.

Poland's proposals for changes in direct payments for 2014–2020

In July 2014, Poland presented draft amendments of direct payments to the European Commission. On the one hand, the draft adapts the system to the EU regulations. On the other hand, it takes into account the specificity of Polish farms [Project... 2014]. Funds for the direct payments for 2014–2020 (the system will be implemented from 2015) will amount to 23.49 billion EUR (out of 32.09 billion EUR for Poland within the CAP). One of the objectives of the proposed system is to support active small and medium-sized farms. It will be possible by shifting 25% of the envelope of the second pillar, i.e. 2.34 billion EUR, to the direct payments. These funds will primarily be used to finance additional payment for small and medium-sized farms, to the initial hectares from the range of 3.01–30 ha. It is also planned to allocate 15% of the national envelope to the payments related to production. The support will include, among others, following sectors: cattle, cows, sheep and goats, crops, soft fruits, tomatoes and starch potatoes. A new element, which is very important in the payment system, is the use of 30% of the funds for so-called green payment related to crop diversification, maintenance of permanent pasture or grassland ecology. In order to simplify the system and to reduce administrative costs, there was proposed a system for small farms, farms receiving up to 1,250 EUR, that which will release them from the control in terms of greening and cross-compliance. In accordance with the proposals of the European Commission, the support will be provided only to the economically active farmers. Restrictions on the direct support will be applied to individuals and legal entities that receive more than 5 thousand EUR and manage airports, water supply, sports or recreational grounds [Project... 2014]. Moreover, Poland proposed implementation of digressivity, involving reduction by 100% of the amount of the single direct payment exceeding 150 thousand EUR. The proposal submitted by Poland, after the approval by the European Commission, will be implemented from 2015.

CONCLUSIONS

Although there were many new regulation proposed by the European Commission as regards the direct payments system for the years 2014–2020, this system remains verified in different EU Member States. What is true is that the definition of the professionally active farmer, namely the beneficiary of the payments was done, but the possibility was left of establishing the threshold value below which this definition would not apply. Determining the threshold value depends on the decision of the state concerned, which causes differentiation of the system.

It was good that during the reform for the years 2014–2020, the decision was taken to exclude the entrepreneurs who do not run the farming activities but for example, administer the airports, the water pipelines, recreational sports grounds and others. In this case, it seems appropriate to leave the decision to the member states to complement the list by other landowning non-agricultural enterprises, which should not participate in the system.

The next most controversial issue in the field of payments is the differentiation of their amount per unit area in the EU Member States. It is true that in the period of 2014–2020 the activities will be taken to level up the differences in the amount of payments, but we are still very far from their alignment, which directly translates into competitiveness of the agriculture. The Member States were also required to reduce the payments paid out to large farms receiving more than 150 thousand EUR per year. However, it shall be remembered that there are fewer and fewer such farms and the savings accumulated in this way will not substantially increase the European Agricultural Fund for Rural Development.

Summing up the reform in the field of direct payments, it shall be noted that not all of the declared objectives of the European Commission concerning the standardization and simplification of this system have been achieved. Still, this system is varied in different Member States of the EU and therefore it is difficult to expect in the coming years the simplification and the reduction of the administrative costs of the system.

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PŁATNOŚCI BEZPOŚREDNIE W ŚWIETLE REGULACJI WSPÓLNEJ POLITYKI ROLNEJ NA LATA 2014–2020

Streszczenie. W artykule przedstawiono ocenę zmian w systemie płatności bezpośrednich jako instrumentu WPR UE w nowej perspektywie finansowej na lata 2014–2020. Pokazano zmiany w rozmiarach finansowania wspólnej polityki rolnej w ujęciu historycznym, a także poziom wydatków przewidzianych na płatności bezpośrednie. Dokonano przeglądu zmian w systemie płatności, odnosząc się do zróżnicowania tego mechanizmu w poszczególnych państwach członkowskich. W artykule przedstawiono argumenty i dowody, że nowe rozwiązania w zakresie płatności w dalszym ciągu są niejednolite i wiele regulacji w ich zakresie pozostawia się do decyzji poszczególnych państw członkowskich. Nowością w aktualnej perspektywie finansowej jest zdefiniowanie rolnika aktywnego zawodowo, stworzenie możliwości przesunięcia części środków finansowych z systemu płatności na

obszary wiejskie i odwrotnie, a także wprowadzenie nowych zasad odnośnie wymogów środowiskowych w gospodarstwie.

Słowa kluczowe: wspólna polityka rolna, płatności bezpośrednie, perspektywa finansowa 2014–2020

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THE COMPARATIVE ANALYSIS OF AGRICULTURAL FINANCIAL SYSTEMS IN POLAND AND AZERBAIJAN

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Abstract. This paper makes a comparative analysis of agricultural financial systems in Poland and Azerbaijan. Poland as a member the of EU has developed its system under Common Agricultural Policy of the EU and so-called domestic support. The system is consisted of financial intermediaries, state agencies (ARMA, AMA), instruments (preferential credits, and subsidies) and regulations. In comparison, Azerbaijan's agricultural financial system is mainly based on support by state agencies. Thus, share of agriculture credits in portfolio of banks and non-bank credit organizations is very small. Azerbaijan state agencies use instruments such as preferential credits, direct and indirect subsidies, and technological support. However, there are serious challenges which make agricultural financial system and the support less effective. It is concluded that Azerbaijan should benefit from good experiences of Poland in order to make the system more effective.

Key words: agricultural financial system, Azerbaijan, Poland, financial intermediaries, state agencies, comparative analysis

INTRODUCTION

In the agricultural financial system we can find the same elements like in general financial system which encompass financial: institutions, instruments, markets and regulations – rules of game. Agricultural financial system can be treated as a subsystem of the financial system of economy. Of course, it has its own special characteristics which are an effect of individuality of agricultural production, agrarian structure, ownership rights, and the history.

The aim of the paper is to present and compare the agricultural financial systems of the two countries which are located very far each other, have different historical experiences, different agrarian structures and tradition. The logic of such comparison stems from the fact that in the time of globalization, ideas, tools, modes of organisations are

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disseminated very quickly and their promising elements can be adopted creatively and developed successfully, even in countries located on different continents.

MATERIALS AND METHODS

Data and information were taken from sources like: World Bank, The Central Statistical Office in Poland, National Bank of Azerbaijan, Azerbaijan Ministry of Agriculture, Agency for Restructuring and Modernisation of Agriculture in Poland, scientific literature.

In the paper two methods prevail: descriptive and comparative.

AGRICULTURAL FINANCIAL SYSTEM STRUCTURE IN POLAND

Characteristics of the Polish agriculture

Even in the communistic period, individually-owned farmers were dominating in the Polish agriculture structure with owning 76% of the total agriculture land area [Banski 2011]. The role of agriculture in economy estimated as the proportion of agriculture in GDP in years 2000–2012 ranged 2.6–4.5% is rather small, but from the perspective of proportion in employment and export of agrifood sector, quite important. The employment in agriculture was falling very slow which stemmed from changes in employment in the economy (Table 1). It is worth to underline that after Poland's accession to the European Union, export of agrifood sector soared in comparative terms as well as in absolute terms.

Table 1. Agriculture sector in Polish economy

Year	Agriculture Production (milions USD)	% in GDP	% in employment	% of export
2000	7 554.4	3.1	26.3	8.4
2002	7 916.6	2.7	15.6[a]	8.0
2004	11 466.4	4.5	16.1	8.7
2006	12 870.3	3.8	16.1	9.8
2008	17 307.8	3.3	15.1	10.1
2010	14 620.2	3.3	15.6	11.2
2012	×	3.5	15.5	12.5

[a]The fall comparing to previous year was caused by change in methodology.
Source: Authors' own creation based on Statistical Yearbooks of the Republic of Poland 2001–2013.

The present financial system of the Polish agriculture is a result of mixture of processes which have taken place in the past. Among them, the Poland's accession to the EU deserves for special attention because the Polish agriculture has undergone Common Agricultural Policy (CAP) which is the most developed policy in EU and disposes of enormous financial means. As aforementioned, the system consists from some key elements: organisations, instruments, and regulations.

Organisations and instruments of agricultural financial system

Organisational structure of agricultural financial system and instruments used by those organizations are illustrated in Figure 1. Financial system of agriculture encompasses financial intermediaries such as banks and state agencies, those are responsible for distribution of subsidies directed to agriculture.

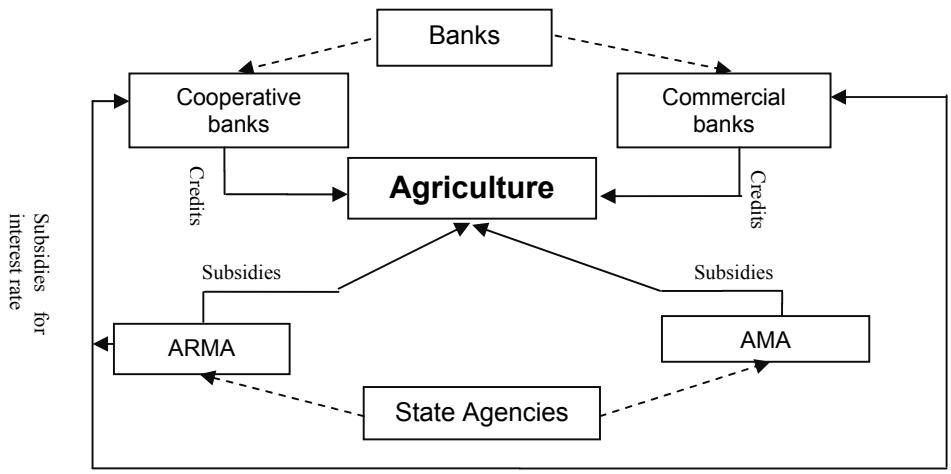

Fig. 1. The scheme of organisations in financial system of the Polish agriculture
Source: Authors' own elaboration.

There are two types of banks servicing the agriculture in Poland – cooperative banks and commercial banks. In 2012, 572 cooperative banks and 45 commercial were conducting activity in Poland.

In 1999, the two kind of banks have the same share in agricultural credit market but in the some following years, the commercial banks focused on wealthier groups of society and in 2009 the proportion of cooperative banks in agricultural credit market arrived at 73%. Next year, this tendency changed and the proportion slipped back to 62% in 2012. It shows the competition between cooperative and commercial sectors of banking for the clients. It is necessary to underline that in conditions of membership in the EU with its CAP offering great support for agriculture and rural areas, the attractiveness of agriculture for banks has risen.

There are two kinds of credits in the Polish agriculture: commercial which are allowed on market terms like for other sectors of economy and preferential which preferential terms were expressed by lower interest rate, longer grace period, and longer maturity. In the case of the most popular credit lines: for young farmers and for purchase of land, farmers paid interest rate equal to only one quarter of central bank discount rate, the grace period was 2 years, the years of maturity – 15 years.

The commercial banks were especially interested in granting preferential credits, whereas cooperative banks granted both kinds of credits (Table 2). In the years 1994––2003 (till Poland's accession to the EU) banks granted nearly 290 thousands of investment preferential credits of value in nominal terms estimated at about 5 billions USD.

Moreover, farmers were offered preferential credit for working capital. Every year, 300––400 thousands of farmers took this kind of credit. After accession during 2004–2012 the number of preferential credits sank to 140 thousands but of approximately value estimated at 6 billions USD.

Table 2. Structure of agricultural debt by groups of banks and type of credits (%)

Year	Structure of agricultural debt by type of credit		Structure of agricultural debt in cooperative banks		Structure of agricultural debt in commercial banks	
	Commercial credits	Preferential credits	Commercial credits	Preferential credits	Commercial credits	Preferential credits
2000	18.7	81.3	17.8	82.2	34.0	66.0
2002	20.3	79.7	22.6	77.4	18.3	81.7
2004	14.9	85.1	20.3	79.7	3.2	96.8
2006	20.3	79.7	26.3	73.7	4.8	95.2
2008	21.6	78.4	26.4	73.6	7.6	92.4
2010	28.7	71.3	32.9	67.1	19.9	80.1
2012	38.2	61.8	38.9	61.1	36.7	63.3

Source: As in Table 1.

State agencies are the other group of organisations important for the agriculture finances. At the beginning of market economy, setting up agencies responsible for financial help for agriculture was popular form of intervention in post socialistic countries. Such organizations were established in Czech Republic, Slovakia and Hungary [Chrastinova 1999, Silar, Doucha 1999, Ulrich 1999]. Hungary set up even two funds: one for small and medium holders and one for large farms [Koester 2001].

In Poland, state agency – Agency for Restructuring and Modernisation of Agriculture (ARMA) was established in 1993. It has been responsible for running the credit support system for the Polish agriculture. It has cooperated with banks that have granted preferential credits to farmers from their own resources and on own risk. Agency administers the subsidies for interest rate on preferential credits and controls the banks if they follow the rules on preferential credits issued by Council of Ministry. After the accession to the EU (2004), the Agency was assigned the function of the accredited paying agency for the majority of the CAP measures. The second state agency supporting Polish agri-food sector is Agricultural Market Agency (AMA). It was established in 1990. Since 2004, like ARMA, the AMA is an accredited EU Paying Agency, engaged with distributing financial support to, and performing controls over manufacturing of agricultural products under the CAP. To agriculture, the scheme of purchase of cereals at intervention price is directed. Other schemes influence the situation of agricultural producers indirectly.

The membership in the EU has enabled the Polish farmers to access to the support under the CAP. Under financial perspectives 2004–2006 and 2007–2013[1] CAP offered many measures to agriculture. They can be divided into direct payments for farmers (income support, Pillar I) and payments connected with rural development policies (Pillar

[1]In EU, the terms and targets of the support are established for the 7-years periods called financial perspectives. Poland entered EU in May of 2004 during the financial perspective 2000–2006, so the program of the support was prepared for years 2004–2006.

II). Every year about 1.4 million of farms applied for the direct payments, additional, 740 thousand farms got payment because of carrying activity in less favoured areas. The yearly value of support at the beginning was estimated at 2–3 billion USD and was rising till 5 billion USD in 2011 (Table 3).

Table 3. Direct payment in the frame of CAP support in 2004–2012

Year	Direct payments (millions PLN)	Payments for Less Favoured Areas	
	Subsidies per season[a] (millions PLN, in parenthesises millions USD[b])	Number of beneficiaries (thousands)	Subsidies (millions PLN, in parenthesises millions USD[b])
2004	6 015 (1 648)	628.8	1 145 (314)
2005	6 680 (2 062)	708.8	1 442 (450)
2006	7 792 (2 514)	717.6	1 294 (417)
2007	8 281 (2 990)	737.7	1 076 (388)
2008	8 588 (3 563)	744.6	1 089 (452)
2009	12 148 (3 894)	741.9	1 088 (349)
2010	12 579 (4 165)	729.3	1 081 (358)
2011	14 105 (4 765)	725.0	1 086 (367)
2012	1 221[b] (407)	611.5	865 (288)

[a]Payment for season is paid in the fourth quarter of the current year and in the first half of the next year.
[b]The exchange rate – average in year, it changed distinctly.
Source: Own calculations based on Report of Agency for Restructuring and Modernisation of Agriculture.

The scope of the support targets has been rather vast and the size of support quite big. For example, the subsidy in the measure "setting up young farmers" equals 75 thousand PLN (about 25 thousand USD) whereas in measure "the modernization of farms" can cover 40–75% of the value of investment. The number of the agreement made with farmers in the frame of the most popular investment measures: "start up young farmers" and "modernization of farms" in years 2004–2012 was amounted at 120 thousand of value 4 billion USD.

Although, the advantages of the support in the form of subsidies is evident in comparison to repayable instrument like credit even preferential, the farmers are still interested in credit. There are some reasons of this phenomenon. First, the scope of CAP measures is wide but not all targets can be supported. Second, farmers get the subsidies after bringing investment to operation, so they have to finance the investment. Banks are exploiting this situation and offer special credit for financing such investment. Third, farmers need money for required own contribution in financing the investment. In result, debt of agriculture climbs consistently.

Regulations as an element of financial system of agriculture include state law issued by the Parliament, Council of Ministers, Ministers or other eligible state agendas and internal regulations in different organisations which are significant only for them. Among them, the acts of Parliament like Banking Act, Cooperative Law and acts establishing the aforementioned state agencies are basic. The detailed rules which ultimately decide about the terms of preferential credits or subsidies are described in the Regulations of Council of Ministry and President of ARMA. In the case of involvement of public money, the

proper allocation of subsidies is the important issue what means that subsidies are granted to agents who are eligible by law and use the subsidies for acceptable by regulations aims. The evaluation of correctness of the allocation is general positive. The very low proportion of irregular claims in the preferential agricultural credits estimated at 2.7% in 2012 [Monitoring... 2012] expresses it. The state regulation that farmers who delay with repayment, loose the right to preferential interest rate and those who use the credit for other than declared aim have to give back the subsidies, seems be very effective. In the case of subsidies under CAP, the regulations are very strict and the system of enforcement is effective.

AGRICULTURAL FINANCIAL SYSTEM IN AZERBAIJAN

Like Poland, Azerbaijan has also been a part of similar economic system until regaining of its independence in 1991. The transition process from planned to market economy system was already started in first years of independence. However, 1991–1994 severe economic crises destructed Azerbaijan economy and delayed the transition process. After 1995, Azerbaijan government initiated mass privatization process and accelerated the transition process. Especially in agriculture, government implemented reforms such as distribution of land among private sector and privatization the property of old "Sovhozes" and "Kolhoses" [Thomas 2006]. Agriculture system was totally destructed and strong government policies and financial support was required to re-build the system in this sector.

The Characteristics of the Azerbaijan agriculture

Mass privatization was performed successfully in agriculture sector last decade of past century. Thus, in 2002, 96% of "cultivated land" and 98% of "livestock inventories" were divided among individual farms and 80% of them did farming by themselves, just 1/10 of total land was leased to others [Dudwick et al. 2007]. In 1999, 97% of agricultural production was realized by private farms and household plots [Spoor and Visser 2001].

According to the World Bank indicators, agricultural land contains more than 57% of land area in Azerbaijan. Suitable climate conditions enable cultivation of many agricultural products. World Bank study indicates that Azerbaijan has comparative advantage in production of Fruit and Vegetable and Dairy Production [World Bank 2005, p. 13]. Data (Table 4) show a continuous decline in proportion of agriculture in GDP and merchandise export, except 2012. It stems from increasing oil production and export until 2012. In fact, agricultural production was rising throughout all the period. Share of agriculture in employment is significantly high – more than 1/3 of total labour force. That is why Azerbaijan government considers agriculture as a strategic sector in economy and implements policies targeted to its development.

Agricultural financial system structure in Azerbaijan

Like Poland, Azerbaijan agricultural system structure is also based on activities of the financial intermediaries, and state agencies (Fig. 2).

Both public and private organizations take a significant role in financing agriculture.

Table 4. Agriculture sector in Azerbaijan economy

Year	Agriculture Production (millions USD)	% in GDP	% in employment	% in merchandise export
2000	848.10	17.14	41.00	2.38
2002	870.20	15.17	40.20	1.26
2004	953.80	11.84	39.50	1.15
2006	1 487.90	7.50	39.09	0.70
2008	2 721.50	5.97	38.40	0.04
2010	2 933.40	5.95	38.20	0.06
2012	3 433.04	5.49	37.70	0.08

Source: World Bank, World Development Indicators.

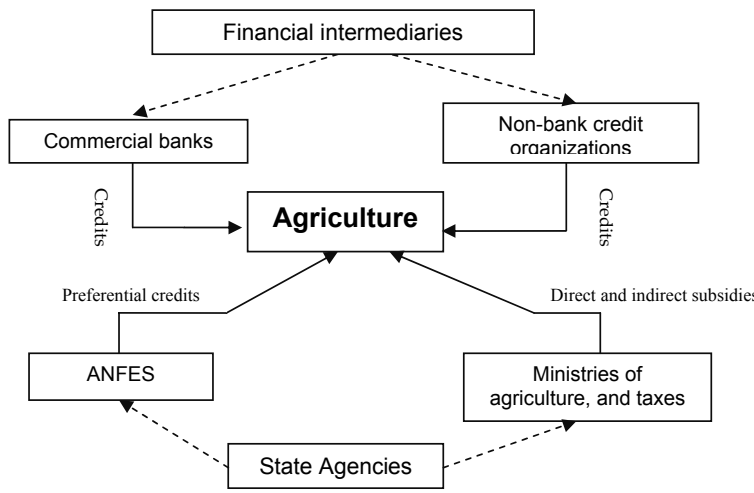

Fig. 2. The scheme of organisations in financial system of Azerbaijan agriculture
Source: Author's own elaboration.

According to the Azerbaijan Central Bank, there were 43 licensed banks and 148 non--bank credit organizations in the country at the end of 2013 [NBA 2014]. Nevertheless, most of those organizations are not interested in crediting agriculture sector. On the other hand, creditor organisations require farmers to declare a "guarantee" such as real estate. That is why share of agricultural loans in total credit portfolio of both organizations is small (Table 5).

Table 5. Agriculture and processing loans in credit portfolio

Specification	2005	2006	2007	2008	2009	2010	2011	2012
Total (millions USD)[a]	125.12	175	258.82	335.25	506.15	565.76	598.33	700.25
Share in total (%)	6.8	5.8	4.2	3.6	4.7	4.8	4.7	4.5

[a]1 USD = 0.78 AZN.
Source: National Bank of Azerbaijan.

Amount of credit portfolio of agriculture has increased continuously but, its share in total portfolio has decreased 2.3 percentage point in 2012 in comparison with 2005 (Table 5). This implies that lesser part of the increase in total credit portfolio has gone to agriculture sector. On the other hand, 4.5% share of this sector in total is very small and requires making agricultural farmers more attractive for banks and non-bank credit organizations to give loans.

Azerbaijan Republic National Fund for Entrepreneurship Support (ANFES) was establishment after the declaration of independence, aimed to "provide credits from the state budget for entrepreneurship" (ANSEF). The fund has been mainly active after 2002 which had ensured 154.5 million AZN (198,040.12 thousand USD) preferential credits for processing of agricultural products, and nearly 500 million AZN (640,073.58 thousand USD) credits for agricultural production. Almost for every year, more than 50% of total credit amount of ANFES has gone to Azerbaijan agriculture (Table 6). In 2013, nearly 96% of total accepted projects were related to processing of agricultural products or agricultural production, and more than 66% of total credit amount has gone to this sector.

Table 6. ANFES support to the Azerbaijan agricultural

Year	Fields of economy	Amount of projects	Share in total (%)	Credit amount (thousands USD)	Share in total (%)
2002	Processing of agricultural products	8	16.3	444.61	23.5
	Agricultural production	19	38.8	566.66	29.9
2003	Processing of agricultural products	30	9.7	2 536.02	18.4
	Agricultural production	177	57.1	4 886.28	35.4
2004	Processing of agricultural products	70	5.2	3 522.94	14.9
	Agricultural production	1 055	78.8	9 716.66	41.0
2005	Processing of agricultural products	44	2.0	9 042.82	19.4
	Agricultural production	1 767	80.2	16 651.02	35.8
2006	Processing of agricultural product	54	3.0	16 123.71	14.0
	Agricultural production	1 256	70.9	30 107.69	26.1
2007	Processing of agricultural products	29	3.3	17 872.56	15.4
	Agricultural production	572	64.9	30 936.41	26.6
2008	Processing of agricultural products	25	3.1	10 823.71	9.6
	Agricultural production	547	68.6	36 871.41	32.8
2009	Processing of agricultural products	19	0.9	25 183.97	15.2
	Agricultural production	1 939	92.3	28 940.12	17.4
2010	Processing of agricultural products	16	1.1	13 269.23	9.0
	Agricultural production	1 303	91.1	71 284.48	48.4
2011	Processing of agricultural products	13	0.8	21 606.41	12.2
	Agricultural production	1 503	91.5	90 203.20	51.0
2012	Processing of agricultural products	10	0.4	35 717.94	12.8
	Agricultural production	2 234	92.3	128 164.74	45.8
2013	Processing of agricultural products	10	0.2	41 896.15	11.9
	Agricultural production	4 276	95.7	191 680.76	54.4
Processing of agricultural products in total		×	×	198 040.12	×
Agricultural production in total		×	×	640 073.58	×

Source: ANFES.

Loans provided by ANFES are given with maximum 6% interest rate, and the amount may become between 5 thousand and 1 million AZN (6,410-1,282,051 USD) for the period maximum 10 years based on amount of the credit.

Azerbaijan government grants agricultural farmers financial support, directly and indirectly, in terms of direct subsidies, tax cut or technical support through Ministries of Agriculture, and Taxes. The state pays for 50% costs of fertilizers and fuel used by farmers, finances purchasing of more productive seeds, and grant subsidies for wheat plants per hectare. Thus, until August 2013, 644.89 million AZN (826.78 million USD) direct subsidies have been given to agricultural farmers, respectively for costs of fertilizers 87.29 million AZN (111.91 million USD), costs of fuel and motor oils 378.25 million AZN (484.93 million USD), purchasing seeds 33.05 million AZN (42.37 million USD), and wheat plants 146.3 million AZN (187.56 million USD). On the other hand, agricultural farmers are free of taxes that until August 2013, total amount of tax concessions has been 1.4 billion AZN (1.79 billion USD). In addition, farmers get technical support from Aqrolizing ASC – a state company supervised by Ministry of Agriculture. So that, until August 2013, Aqrolizing ASC has ensured farmers with 5,142 tractors, 1,286 harvesters, 10,723 other kinds of techniques.

In Azerbaijan, activities of banks and non-bank credit organizations are regulated by the Law of the Republic of Azerbaijan on Banks. Obviously, all banks and non-bank credit organizations follow the principles of this law while giving loans to the agricultural farmers as well. On the other hand, agricultural support done by ANFES refers to the Charter of the National Fund of the Republic of Azerbaijan for Entrepreneurship Support and the Rules on use of funds from the National Fund for Entrepreneurship Support of Azerbaijan Republic. Moreover, direct and indirect subsidies issued by Ministry of Agriculture and tax concessions by the Ministry of Taxes refer to the Decree of the President of the Republic of Azerbaijan on additional measures in the field of improvement of the activities of the agricultural and food products market, and the Law of the Republic of Azerbaijan on granting temporary tax concessions for agricultural producers. As a state company, Aqrolizing ASC follows the Rules on leasing of agricultural machinery and equipment belonging to "Agro" Open Joint Stock Company to businesses and individuals or their sale by way of lease, approved by the Cabinet of Ministries of the Azerbaijan.

Challenges for the agricultural financial system in Azerbaijan – efficiency issue

Above, we looked through the agricultural financial system in Azerbaijan, as well as parties of this system. At first sight, it seems pretty good with legal basis, instruments, and amount of support. However, when we look at changes in the share of agriculture sector in Azerbaijan economy as well as the agricultural production, this amount of support seems as not used efficiently. Thus, despite of this amount of continuous direct and indirect state support, agriculture still produces a little part of total GDP which employs significant part of the total labour force. Production in this sector is still labour incentive.

Challenges for the Azerbaijan's agricultural financial system may be classified as issues derived from characteristics of country's agriculture sector, and system related issues. Ownership structure in agriculture sector is the biggest challenge for development

of agricultural production as well as the efficient use of subsidies and preferential credits. Thus, according to the Statistical Committee of the Republic of Azerbaijan, 96% of plant--growing products and 90.7% cattle-breeding products are produced by individual farmers and households, which are generally very small. Too small share of entrepreneurs in agricultural production does not enable efficient application international experience and technology by using preferential credits and subsidies. In addition, households cultivate agricultural lands with traditional ways or labour intensive methods rather than actively employing new technology, and there is serious qualified personal problem in this sector which causes to lower production than possibilities. On the other hand, households and most entrepreneurs are uninformed or less informed about how realise marketing of their products in internal market even if they achieve high productivity. Impossibility of exporting their products to international markets for households and small and medium entrepreneurs is another serious issue. Households and small entrepreneurs cannot invest in technology purchasing, and research and development (R-D) projects. All these issues related to characteristics of Azerbaijan agriculture lead to less efficiency of direct and indirect financial support of the government to agriculture.

The biggest system related challenge is controlling the use of preferential credits given for agricultural purposes. Available funds at ANSEF given to agricultural farmers are used for other purposes in part or totally. Banks and non-bank credit organizations are not interested in crediting agriculture farmers most probably because of high risk, and less amount of large agricultural enterprises. In addition, those financial intermediaries request farmers to indicate "guaranties" such as real estate with high liquidity in order to take even a small amount of commercial credit which is out of most farmers' potential.

Financial intermediaries and ANSEF require farmers to submit detailed business plans of their agricultural projects despite the fact that most farmers does not know even what the business plan is. In order to get credit from ANSEF, farmers pay someone or an organization to write a business plan for their agricultural project. In most cases, those business plans do not represent actual numbers or estimations. In addition, farmers face many other challenges until gaining subsidies and credits, such as preparing required documents as well as pursuing defined official procedure. In Azerbaijan, giving "receipt" after purchasing-selling operations has not been developed yet, that we do not know how farmers get direct payments for 50% of fuel and fertilizer costs.

COMPARATIVE ANALYSIS – RECOMMENDATIONS FOR AZERBAIJAN

Above, agricultural financial system structure of Poland and Azerbaijan, were discussed separately. Since 2004, Poland as a member of EU has introduced measures of CAP. In this sense, studying agricultural experience of Poland means studying the agricultural system of EU. There are many things Azerbaijan can benefit from this experience.

In comparison with Azerbaijan, the average area size per farm in Poland has been rising steadily and in 2012, it had been about 45% higher comparing to 2000, but in 2012 still 76.4% of farms was smaller than 10 ha. However, the process of concentration of land is observed and the biggest farms (50 ha and more) owned 32.5% of agricultural

land in 2012 whereas in 2002 only 15.5%. This is obviously big success for Poland. Unfortunately, in the case of Azerbaijan the similar characteristic is not available. However, as it was mentioned above, although all agricultural enterprises produce very small share of total agricultural production, Azerbaijan agricultural policy-makers should benefit the experience of Poland about how to encourage farmers to enlarge their enterprises or join within a union. This would make agricultural production more effective. It would also increase the effectiveness of preferential credits, and direct and indirect subsidies ensured by Azerbaijan state agencies.

The other issue Azerbaijan may benefit from Poland experience is related to the type of support to agricultural farmers and enterprises. Polish farmers get direct payments such as income support as well as payments because of carrying activity in less favoured areas. Agricultural land in Azerbaijan also divides into favoured and less favoured areas. That is why state agencies should suggest special financial and technical support to the farmers and enterprises in less favoured agricultural areas in order to ensure balanced development of this sector in all regions of the republic.

Other essential point in Polish experience is related to support to "setting up young farmers" and "the modernization of farms". Such kind of direct financial support, especially for "setting up young farmers" should be implemented and trainings for young farmers would make those payments more effective. On the other hand, as a result of subsidies for modernization of farms, Azerbaijan may solve traditional way of production issue through application of new agricultural technologies. We consider that Azerbaijan government should support financially the establishment and development of medium and large agricultural enterprises with direct payments for young farmers and to modernize the old farms.

As the last, Azerbaijan may benefit from the experience of Poland in efficient controlling the use of agricultural credits and subsidies as well as repayment of the preferential credits. If Azerbaijan policy-makers achieve the effective use of funds for agricultural purposes – preferential credits and direct and indirect subsidies, as intended, agriculture in Azerbaijan economy is expected to grow rapidly.

CONCLUSIONS

The aim of this paper was to study agricultural financial system in Poland and Azerbaijan, and compare the system in these countries. In comparison with Azerbaijan, Poland launched effective agricultural policies, and after joining to EU, it followed Common Agricultural Policy (CAP) within the Union.

After analyzing agricultural financial system in Poland, we concluded that the system is well developed. Before the EU membership, the financial support was mainly in the form of preferential credits. In conditions of membership in EU, the domestic sources of financing changed their role and importance. The support offered by CAP is of much greater value and as non-repayable form is more advantageous for farmers. However it does not mean that it has eliminated the credits. The credits still play important role in agriculture and are indispensible condition of using subsidies offered under CAP. The performance of the agricultural financial system is constructive partly due to well

operating banking system and concentration of financial support in one state agency, accurate rules and enforcement of these rules.

Authors' analysis of agricultural financial system in Azerbaijan found out that banks and non-bank credit organizations are not so much interested in crediting farmers. Instead, state agencies are very active in financing agriculture sector through offering preferential credits, direct and indirect subsidies as well as technological support. Despite of huge amount of financial support, less development of agriculture in Azerbaijan economy brings some challenges. Azerbaijan can benefit the experience of Poland in some aspects which would make agricultural financial system and government support more effective.

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SYSTEMY FINANSOWANIA ROLNICTWA W POLSCE I AZERBEJDŻANIE – UJĘCIE PORÓWNAWCZE

Streszczenie. W opracowaniu dokonano porównania systemów finansowania rolnictwa w Polsce i Azerbejdżanie. Polska jako członek UE ma rozwinięty system finansowania, który podlega regulacjom w ramach WPR i tak zwanej pomocy krajowej. System w Polsce składa się z pośredników finansowych (banki) państwowych agencji (ARiMR ARR), instrumentów (kredyt i subsydia) oraz regulacji. Dla porównania w Azerbejdżanie system wsparcia rolnictwa jest oparty na subsydiach z agencji państwowych. Udział kredytów rolniczych w portofolio banków i niebankowych instytucji kredytowych jest bardzo mały. Państwowe agencje w Azerbejdżanie stosują kredyt preferencyjny, pośrednie i bezpośrednie subsydia oraz wsparcie technologiczne. Jednak system wsparcia jest mało efektywny. Wykorzystanie polskich dobrych doświadczeń może pomóc zwiększyć efektywność systemu.

Słowa kluczowe: system finansowy rolnictwa, Azerbejdżan, Polska, pośrednicy finansowi, agencje rządowe, analiza porównawcza

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DEVELOPMENT OF ORGANIC FARMING IN THE USA

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Abstract. The objective of the paper is to present the development of organic farming in the USA. The development of organic farming is closely linked to the sustainable theory development with economic, social and environmental goals. The aim of organic farming is to produce using a sustainable balance of natural resources. Equally important is production based on organic methods that do not use chemical fertilizers. Authors used the descriptive methods to analyze collected material. Authors have analyzed data from 2000 to 2010, mainly USDA data to analyze the state and development processes of organic farming in the USA. The collected data shows that organic farming is dynamically expanding in the US. The number of organic farms increased in the years 1992–2008 nearly 361%, but it decreased 29.4% in the years 2008–2011. Particularly big changes occurred in certified organic acreages for milk cows (1,936%), pastures (438%), and fruits (250%) in the years 2008–2011. Moreover, the percentage of organic food in the total food market increased from 1.6% in 2000 to 4% in 2010. The data proved that organic produce accounted for 37% of US organic food sales in 2008. US is a big exporter of organic commodities with the highest percentage in 2011 for lettuce, apples and grapes. However the imports exceeds exports. The analysis of collected material proved growing demand for organic products of American society. However, the price of organic products is still high and the increase of organic food production may drop the prices.

Key words: development, organic farming, the USA

INTRODUCTION

Organic farming is considered to be alternative to conventional agricultural practices. This system is different from other types of agriculture because its rules are regulated within legal framework [Oelofse et al. 2011]. The world's first organic course at Koberwitz in Silesia (now Kobierzyce, Poland) run by Rudolf Steiner who led to the development of "biodynamic agriculture", and, more generally to "organic farming" [Steiner 1924].

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In 1940 J.I. Rodale used the term, "organic farming" in US. In England the term was used by Lord Northbourne and described it as "dynamic living organic whole" [Thilmany 2006].

Organic farming is a very important kind of rural activity. USDA's National Organic Program defines organic production as "a system that is managed in accordance with the Organic Foods Production Act (OFPA) of 1990 and regulations in Title 7, Part 205 of the Code of Federal Regulations to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity. The National Organic Program (NOP) develops, implements, and administers national production, handling, and labeling standards". As defined by the USDA Study Team on Organic Farming: "Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives. To the maximum extent feasible, organic farming systems rely upon crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, mechanical cultivation, mineral-bearing rocks, and aspects of biological pest control to maintain soil productivity to supply plant nutrients, and to control insects, weeds and other pests" [Report and Recommendations on Organic Farming 1980]. The definition of organic agriculture is supported by International Federation of Organic Agriculture Movement (IFOAM) according to which it is "a production system that sustains the health of soil, ecosystems, and people. It relies on ecological process, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects" [International Federation of Organic Agriculture Movements]. Another definition describes organic farming as a philosophy and system of farming that helps maintain ecological awareness of society [Goshing et al. 2006].

Organic farming is an activity that enables producers to raise crops in accordance with harmony with land and local conditions. But organic farming requires more labour than conventional farming. The owners of organic farms must hire labour and the system is based on crop rotation to sustain the fertility of land [Dmitri 2010]. The survey carried out by Klimek and Baran [2007] proved that organic agriculture is developing well in regions having good natural values and landscape amenities, but conditions for large scale agricultural productions are unfavorable.

Nevertheless, as the demand for organic products has grown, larger producers have entered the market. The traditional organic producer is small, but his/her share of the market is shrinking. For example, most organic poultry and eggs are produced on big operations that are integrated by a feed company or some other firm. To develop organic farming one needs financial, educational and organizational support. This will help spread the knowledge about organic farming and improvement of market for organic products [Runowski 1996, 2003]. Organic farming is based on special regulations, standardization and certification, which is designed to support the quality and management of organic production [Jahroh 2010]. Still organic farming can be an opportunity for smaller farms with poor soils and challenging economic conditions [Kucińska et al. 2008].

Because it is more labour-intensive, organic farming can provide employment opportunities, particularly in rural communities. This creating opportunities for unemployed or underemployed people in rural areas, often women [Ortiz Escobar, Hue 2007]. Organic farming can also help farmers to increase their incomes and improve their economic situ-

ation. Farmers engaged in organic farming are more focused on environmental actions and do not use chemical fertilizers [Bórawski 2008].

Organic farming fulfills social, economic, healthy, cultural, political, human and environmental functions. Social functions include the possibilities of creation new jobs. Social functions mean also social trust on a number of levels, such as farmers learning together and building trust among neighbours by sharing machinery and other resources.

Economic effects are mainly characterized by the possibilities to increase farm incomes. Moreover, organic farms contribute to economic development by creating local markets, being involved in many small businesses, and purchasing farm supplies or households needs, often locally.

Healthy functions can be described as the possibilities of health changes of farmers and organic food purchasers and pesticides elimination [Pawlewicz 2007, Prządo 2012].

Cultural functions are the participation of organic producers in the cultural life of their communities, supporting events and helping neighbours.

Political development can be described as participation of organic producers in community issues for example road issues, land-use or school or health-care concerns.

Human functions of organic producers include their involvement in apprenticeship programs to bring up young, environmentally-conscious farmers. Moreover, organic agriculture provides women with many executive functions at different levels.

Finally, environmental functions mean prohibition of use of hazardous substances for people in plant cultivation and animals breeding, meaning the protection of the environment [Sumner 2010]. Environmental functions may help to develop tourism, which "can be one of the effects of a significant improvement in the quality of life of different societies" [Brelik 2012].

THE THEORY OF SUSTAINABLE DEVELOPMENT

Organic farming is closely linked with the theory of sustainable development [Runowski 2009a], which includes different aims: ecological, economic and social. The development of economic efficiency in organic farms is and will be restricted by the rules of certification of harvested plants and breeding animals. One definition describes sustainable development as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [World Commission on Environment and Development's Bruhtland Commission 1987]. But, the concept of sustainable development requires financial support of institutions and policies addressing the main issues, which have many weaknesses in designing and implementing issues [Wei Kua, Gunawansa 2013].

The sustainable development includes strategies, such as:

- solar and wind energy, which can help reduce usage of non-renewable power sources,
- sustainable construction, which uses recycled or renewable sources and may be more energy efficient,
- crop rotation, which reduces fertilizer and chemical use, therefore reducing the diseases in soil,

– water fixtures that conserve water, a crucial part of sustainable development [The definition of Sustainable Development].

Sustainable rural development and organic farming efforts are underway in many countries and rural areas. Organic farming development can contribute to the sustainable development [Pulgiese 2001]. In the process of sustainable development natural, economic and social values are equally important. Organic farming with elimination of chemo-synthetic inputs will reduce production costs and farmers may be able to achieve higher profitability. Social aspects include social interactions, political and cultural development. Environmental aspects represent the benefits of organic agriculture by gains in biodiversity, environmental protection and reduced resource use. Organic agriculture in terms of sustainable development is based on: decentralization, independence, community, harmony with nature, diversity and restraint. In contrast, conventional agriculture often involves: centralization, dependence, competition, domination of nature, specialization and exploitation [Niggli 2007]. Organic agriculture can be described as a sustainable and environmentally friendly system which delivers a wide range of benefits. One is improvement of social capital, a stronger relationship between institutions and farmers, and better implementation of agricultural policy [Organic agriculture and food security in Africa 2008]. Organic farming can be an example of farmers' economic activity. Economic activities of farmers require involvement of land, capital resources and labour [Wojewodzic 2012].

Organic farming has a positive impact on soil and can improve soil quality. Organic farming does not use chemical fertilizers and pesticides, and therefore it can improve the ability of soil to sustain biological activity and diversity. What is more organic agriculture can help to achieve good fertility of land and regulate water and filter and buffer inorganic materials [Karlen et al. 1997]. In addition organic farming restricts hormones and antibiotics for animals, which should have permanent access to open pasture and should meet their nutritious requirements [Organic farming in the EU 2012]. Organic agriculture helps protect agriculture and animal welfare, which results in delivering customers good, healthy and pesticide-free food. Nearly 1.8 million hectares of land was under organic agriculture in 2008 in the US [FiBL-AMI-IFOAM survey 2013].

Organic production in the US is regulated in part by the Farm Bill, which introduced the National Organic Certification Cost-Share Program. This program improves the economic situation of organic producers and introduced the organic certification subsidy. The Farm Bill is an omnibus law that covers many aspects of agricultural policy and expenditures. While traditionally the Farm Bill has dealt with the large acreage commodities, such as corn and wheat, recent Farm Bills have included programs to give alternative agricultural practices access to public funds.

OBJECTIVE AND METHOD

The objective of the paper is to present the state of organic farming development in the USA. An additional objective of the study is to evaluate the organic food market development and exports in the US. Data about organic farming development from USDA and the Research Institute of Organic Agriculture were collected. Authors used

descriptive methods to present the state and development of organic farming in US. The results are presented in tables and figures. Quantitive and qualitive data were analyzed over time, which helped uncover tendencies in the development of organic agriculture and market development in the US.

The research results include certified organic acreages for fruits, milk and pasture. Certified organic livestock and poultry in US in the years 1992–2008 were also presented. To describe the market for organic food in US, authors showed the organic growth and presented the growth of organic products, such as: fruits and vegetables, dairy, beverages, packaged foods, breads and grains, snack food, meat, fish, poultry and condiments, in the years 2000–2010.

The export levels of main organic commodities were also presented.

DEVELOPMENT OF ORGANIC FARMING IN US

The data presented in Figure 1 show the development of organic farming in US. The number of farms engaged in organic production has increased nearly 361% in the years 1992–2008. Such development reflects the growing demand for organic products. However, we can observe the decrease in the years 2008–2011 in the number of farms (29.4%)[1].

The number of farms engaged in organic production is diversified regionally. The six US states with the largest number of farms in 2008 were: California (2,714), Wisconsin (1,222), Washington (887), New York (827), Oregon (657) and Pennsylvania (586) [USDA 2008].

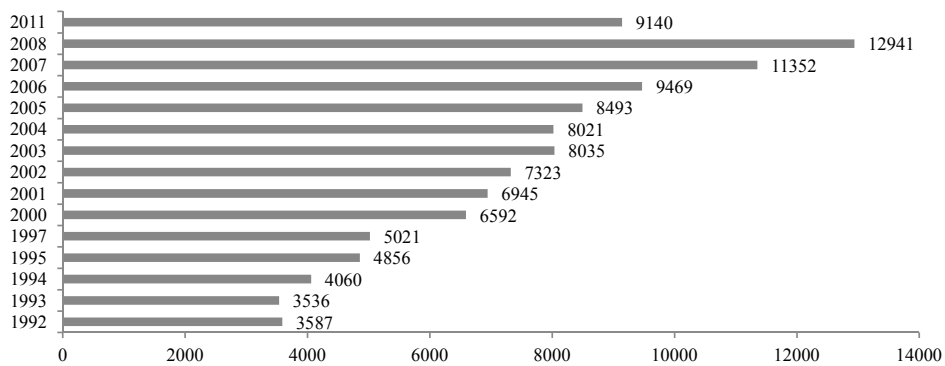

Fig. 1. Number of certified organic farm operations in US in the years 1992–2011
Source: USDA 2008. Census of Agriculture.

[1]The decrease over this period may reflect different methods of survey by the USDA. However, it may also reflect a decline in farm numbers because of the economic challenges during this period. There also may have been mergers between producers to survive the slowing economy and achieve some economies of size. It is unlikely that the entire 29% decrease in farm numbers is exit from organic production. The 2007 data is from the Census of Agriculture and is done by complete enumeration, while the 2011 study is a sample, expanded to try to reflect the entire population. Typically the sample surveys under-measure small producers.

As Runowski [2009b] points out, the main reason of starting a new organic business is the difference between economic efficiency under conventional versus organic production. If the difference is not large, the interest of organic farming is small. An example are the Netherlands. When the organic production achieves greater economic efficiency, then the interest is higher, for example in new countries of EU.

Organic farming can achieve similar results to conventional farming using fewer inputs, helping to sustain fertile soil. This system of production may reduce soil pollution, keep soil micro-organisms healthy, protect biodiversity and control water pollution and soil erosion [Devi et al. 2007].

The United States is a big producer of organic foods. The data presented in Table 1 show the development of organic farming in the USA. Organic acreages for fruits, milk cows and pasture have increased in the years 1997–2008. This increase in certified organic acreages is a result of increasing demand for organic products. Particular increases were in certified organic acreages for milk cows (1,936%), pasture and rangeland (438%), total vegetables (342%), and total fruits (250%) in the years 1997–2008.

Table 1. US area of certified organic fruits and pasture, and number of milk cows breeding in organic system (1997–2011)

Specification	1997	2000	2001	2002	2003	2004	2005	2008	2011
Total Fruits (1,000 acres)	49.41	43.48	55.68	60.69	77.99	80.71	97.28	121.066	81.537
Total Vegetables (1,000 acres)	48.23	62.34	71.67	69.87	78.90	79.52	98.53	164.888	118.071
Milk cows (1,000 head of dairy cows)	12.90	38.20	48.68	67.21	74.44	74.84	87.08	249.766	213.376
Pasture and rangeland (1,000 acres)	496.39	557.17	789.51	625.90	745.27	1 592.27	2 331.16	2 160.58	1 621.68

Source: USDA 2008. Census of Agriculture, Dimitri and Oberholtzer 2009. Marketing U.S. Organic Foods. Recent Trends From Farms to Consumers / EIB-58 Economic Research Service / USDA. USDA, 16.

Organic production is diversified regionally. California had the greatest number of acres devoted to organic fruit and vegetable production in 2005. Following California were Washington, Oregon, North Dakota, Minnesota, Wisconsin, Montana and Iowa. When considering acreages of organic pasture for livestock the leading states in 2005 were California, Texas and Montana [Johnson 2008].

The percentage of organic acreages to total acreages varies widely in the EU, too. Austria, Switzerland, Italy and Sweden are countries with the highest percentage of organic acreages. Among new members of the EU, Latvia, Czech Republic and Slovakia had the highest percentage of organic acreages. As Runowski [2009b] points out, the possibilities of achieving additional subsidies to organic acreages is the main reason for high interest of this kind of production.

Each year the percentage of organic production is increasing. Organic food growth is changing. The data in Table 2 show a big increase in organic livestock and poultry in the US. The number of certified organic livestock and poultry in the US has increased in

Table 2. Number of certified organic livestock and poultry in the US in the years 1997–2011

Year	Livestock					Poultry		
	beef cows	milk cows	other cows	hogs and pigs	sheep and lambs	layer hens	broilers	turkeys
1997	4 429	12 897	–	482	705	537 826	38 285	750
2000	13 829	38 196	–	1 724	2 279	1 113 746	1 924 807	9 138
2001	15 197	48 677	993	3 135	4 207	1 611 662	3 286 456	98 653
2002	23 384	67 207	10 103	2 753	4 915	1 052 272	3 032 189	305 605
2003	27 285	74 435	11 501	6 564	4 561	1 591 181	6 301 014	217 353
2004	36 662	74 840	36 598	4 883	4 270	1 787 901	4 769 104	164 292
2005	36 113	87 082	58 822	10 018	4 471	2 415 056	10 405 879	144 086
2006	41 636	130 159	72 229	7 508	5 372	3 071 994	5 529 933	165 610
2007	64 514	166 178	115 220	9 274	8 155	3 872 271	7 436 321	315 754
2008	63 680	249 766	144 817	10 111	7 455	5 538 011	9 015 984	398 531
2011	35 367	213 376	199 354	12 125	5 741	6 739 949	4 212 752	497 891

Source: USDA, Economic Research Service, based on information from USDA. Accredited State and private organic certifiers.

the years 1997–2008. Particular growth in the years 1997–2008 in US was observed in the number of: turkeys (53,137%), broilers (23,550%), other cows (14,543%), sheep and lambs (10.57%), milk cows (1,937%), beef cows (1,438%), and layer hens (1,030%).

Organic production is diversfied regionally in the US. California had the largest number of beef cows (13,177) and milk cows (55,224) in 2008. Iowa had the largest number of hogs and pigs (3,961) and sheep and lambs (1,491). Pennsylvania had the largest number of layer hens (1,078,000) in 2008 and Nebraska had the largest number of broilers (6,501,000) in 2008.

As Runowski [2009a] points out, initially organic production was focused on plants and later moved into animal production. The priority had ecological plant production before ecological animal production. Similarly, early production was of milk and eggs and later expanded into meat animals.

DEVELOPMENT OF THE MARKET FOR ORGANIC FOOD IN THE US

Organic farming cannot develop without a market for organic food. This includes processing, distribution and selling of organic products. The market for organic food in the US includes demand for organic products and their supply. The ecological awareness of consumers is increasing each year and more consumers want to buy healthy food.

The latest research shows that retail sales of organic foods increased from $3.6 billion in 1997 to $21.1 billion in 2008 in the USA, and that 69% of adults bought organic food at least occasionally in 2008, while 19% of consumers bought organic food weekly in 2008 (3% in late 1990s). Organic food was purchased by 51% of shoppers in 2006 (44% in 2001). Some growth may be attributed to the USDA national standards, implemented in 2002 [Barry 2004]. The constant growth of the US organic industry has caused a major shift in the types and numbers of organic food retailers, manufacturers, distributors, and producers and has widened the retail consumer base [Dmitri, Oberholtzer 2009]. One

important factor in the increased consumption is the wider availability of organic products in mainstream supermarkets. Before 2000, a limited selection of organic products was in supermarkets, with most available only in "health food" stores, which had higher prices and usually required a special shopping trip.

Consumer demand for organic products has been growing. Consumers can buy more organic products from fresh organic fruits to organic frozen foods and beverages. The global market for organic food is worth $59 billion. The European Union and US are the main organic producers in the world and the market increased nearly 8% in 2010 in comparison to 2009 [Organic farming in the EU 2012]. The development of organic farming is differentiated in European Union countries. There were four countries in 2007 where more than 10% of the agricultural land is organic: Lichtenstein (29.7%), Austria (15.9%), Switzerland (11%) and Sweden (10.8%) [Willer 2009]. The tendencies of organic farming development are differentiated. We can describe the process of organic farming development in Great Britain and Australia as regressive, while Germany and Spain record a positive change [Runowski 2009a]. The highest number of organic farms in EU in 2007 was in Italy (45,231 farms) and Greece (23,796). Organic farming has been developing rapidly in Europe, too. According to Willer [2009], the positive growth of organic farming is aided by several policy support measures, such as funding under rural development programmes, legal protection, action plans, as well as support for research.

According to data of the Organic Trade Association, the share of organic market in the total US food market increased from 1.6% in 2000 to 4.0% in 2010. This tendency reveals the increase of consumer demand for organic commodities. The description of market includes the value of retail sales. According to FiBL-AMI-IFOAM survey from 2013, the value of retail sales of organic products was €21,038 million in US in 2011 and 44% of total retail sales value was distributed in 2012. These results demonstrate the big scope of the organic products market development [FiBL-AMI-IFOAM survey 2013].

The market for organic products in the USA has been developing each year. US sales of organic products were $21.1 billion in 2008 over 3% of total food sales and reached $23.0 billion in 2009 [Nutrition Business Journal]. The recession in 2009–2010 hurt organic sales growth.

The consumer demand for organic food is increasing and the competition is increasing in this sector, too. Organic production in US has an impact on global market. The data coming from USDA show that the market is a growing part of worldwide production. It embraced more than 4.1 million acres in 2008 [USDA 2008]. The diversification of a market is a crucial issue for its economic resilience. The development of organic farming is important for the development of agriculture in US and industry. Each additional job in agriculture supports an additional 0.89 jobs elsewhere. Moreover, each additional job in dairy farming creates additional 1.23 jobs elsewhere [Deller, Williams 2009]. Since organic production is more labour-intensive, the same amount of revenue may generate proportionately more jobs.

A survey carried out by Swenson et al. [2007] shows that organic farming has an impact on agriculture and the economy. Organic farming has an impact on economic activity around labour whereas conventional farming has a greater impact on economic activity connected with purchased inputs [Swenson et al. 2007].

Organic produce accounted for 37% of US organic food sales in 2008, followed by dairy (16%), beverages (13%), packaged and prepared foods (13%), bread and grains (10%), snack foods (5%), meat, fish, and poultry (3%), and condiments (3%).

The analysis included the demand for organic products in 2010 US farmers' markets. The strongest demand can be observed in the eastern, western and southern part of the US. Such distribution of high demand for organic production is mainly the result of higher population in these regions. However, this does not explain the pockets of strength in the far Northwest and Northeast. These areas clearly have a strong philosophical interest in organic production beyond their population size. The Southeast, except Florida, is the opposite. Whether pushed by supply or pulled by demand, some regions have much bigger market shares of organic products. Organic food is available in nearly 20 thousand natural food stores and nearly 3 of 4 conventional grocery stores [USDA ERS – Organic Agriculture: Organic Market Overview].

An interesting factor is the exports of US organic commodities. Organic products accounted for more than $410 million in export sales in 2010 [Trade and Equivalency Agreements]. The highest value of export of organic products in 2011 was represented by: lettuce ($85 million), grapes ($60 million) and apples ($46 million). These three commodities accounted for more than 46% in US organic commodities exports in 2011 (Table 3).

Table 3. Export trade data of organic products in 2011

Specification	Organic products export in 2011	
	Million $	%
Potatoes	1 590	0.4
Cherry tomatoes	1 139	0.3
Roma (plum type tomatoes)	1 171	0.3
Tomatoes	2 734	0.7
Onion sets	2 246	0.5
Cauliflower	18 013	4.4
Brocolli	9 873	2.4
Head lettuce	1 868	0.5
Lettuce	85 196	20.6
Carrots	22 696	5.5
Celery	7 082	1.7
Peppers	1 979	0.5
Spinach	20 943	5.1
Oranges	14 182	3.4
Lemons	6 281	1.5
Grapes	60 001	14.6
Apples	46 200	11.2
Pears	8 923	2.2
Cherries	30 624	7.4
Strawberries	15 771	3.8
Blueberries	16 367	4.0
Coffee	15 212	3.7
Tomato sauces	21 941	5.3
Total	412 032	100.0

Source: Trade and Equivalency Agreements. Organic Trade Association. Retrieved from: www.ota.com/GlobalMarkets/Trade_Equivalency.html

On the other hand, organic commodities are also imported into the US. There is no data about imports of organic commodities, however the value of organic imports in 2002 was between $1 billion and $1.5 billion, while the value of organic exports was $125 million [USDA ERS. Organic Agriculture: Organic Trade]. The US is an organic food exporter but imports exceed exports by a ratio of at least 8 to 1 in 2002. A major import is organic corn, especially from China. It was a result of constant increase a demand for organic animal products. Most of the organic products were sold in supermarkets, grocery stores, club stores and mass merchandisers [Thilmany 2006].

The demand for organic products is developing well in Europe and North America and is the fastest growing food market segment based on imports from developing countries [How organic agriculture contributes to economic development in Africa 2010]. The food can be sold at local and regional markets and it is not especially capital intensive. It has been found that organic food sales grew by 9 to16% through 2010 and organic sales will reach 3% of the US food market.

CONCLUSIONS

Organic agriculture has grown rapidly in the US. The number of farms increased by 370% from 1992 to 2008. This increase was aided by improvements in the quality and cost decreases for organic production and as the market grew, more market outlets for organic products. Certainly when conventional supermarkets began to stock organic products, consumers had easier access to healthy food. However, the recession of 2008–2011 hurt organic markets. Smaller farms have seen organic agriculture as an opportunity to escape the fierce competition of producing commodity products for the convention markets. Of course, the organic tradition implies production by small farms, although the rules do not preclude large scale production, and if the returns stay high, the share of organic production by larger producers will grow.

Particular growth in organic production occurs where conditions for selling the products are most favourable. Sizeable increases occurred in the years 1997–2008 for certified organic acreages for milk cows (1,936%), pasture and rangeland (438%), total vegetables (342%), and total fruits (250%). This growth has been driven by growing demand, and helped by easier consumer access.

Organic animal production is developing, too. As organic feed becomes more available, organic eggs and poultry production have expanded. The development of organic animal production was observed based on the example of the number of: turkeys (53,137%), broilers (23,550%), other cows (14,543%), sheep and lambs (10,57%), milk cows (1,937%), beef cows (1,438%), and layer hens (1,030%). Organic pork and beef are also available, but so far are much less important. The increase in animal production confirms growing demand for organic products of American society.

The share of the organic market in the total US food market increased from 1.6% in 2000 to 4.0% in 2010. However, as a premium product category, the market is vulnerable to shocks, such as the global economic crisis, which weakened the organic food growth in the years 2008–2011. Consumers now expect supermarkets and big greengrocers to stock

organic products. The promotion of organic food products by retailers can enhance the still growing demand for US ecological food.

The USA is a big exporter of organic commodities, however imports exceed exports. The excess of imports over exports is a result of the increase in demand for organic products. The number organic product sellers is widening and with products are now sold in supermarkets, grocery stores, club stores and mass merchandisers, whereas in earlier times organic products were mainly available in health food stores. As these products become more mainstream, and the size of producers increase, the premiums of organic food compared to conventional food will drop, making organic food more affordable.

Summing up organic farming will grow in the US in the future. However, the higher prices of organic commodities in comparison to traditional agricultural commodities limit demand. As the organic premiums decrease, the organic share of markets will certainly grow.

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ROZWÓJ ROLNICTWA EKOLOGICZNEGO W USA

Streszczenie. Celem opracowania jest przedstawienie rozwoju rolnictwa ekologicznego w USA. Rozwój rolnictwa ekologicznego jest ściśle związany z teorią zrównoważonego rozwoju obejmującego cele ekonomiczne, społeczne i środowiskowe. Celem rolnictwa ekologicznego jest osiąganie wyznaczonych zadań bez nadmiernego wykorzystania środowiska. Równie ważna jest produkcja wykorzystująca metody organiczne bez nawozów mineralnych. W celu oceny stanu i rozwoju rolnictwa ekologicznego w USA przeanalizowano dane od 2000 do 2010 roku, głównie z bazy danych USDA. Zebrane dane dowodzą, że rolnictwo ekologiczne w USA rozwija się dynamicznie. Liczba gospodarstw ekologicznych uległa zwiększeniu w latach 1992–2008 o blisko 361%. Szczególnie duże zmiany zaobserwowano w powierzchni certyfikowanych upraw dla krów mlecznych (1936%), pastwisk (438%) i owoców (250%). Ponadto udział sprzedaży żywności ekologicznej w sprzedaży żywności ogółem uległ zwiększeniu od 1,6% w 2000 roku do 4% w 2010 roku. Dane dowodzą, że w 2008 roku sprzedano 37% produkcji ekologicznej. Stany Zjednoczone są dużym eksporterem produktów ekologicznych z największym udziałem eksportu sałaty, jabłek i winogron w 2011 roku, jakkolwiek import przewyższa eksport. Analiza zebranego materiału badawczego dowodzi rosnącego popytu na produkty ekologiczne w społeczeń-

stwie amerykańskim. Ceny produktów ekologicznych są nadal wysokie i rozwój produkcji ekologicznej może doprowadzić do ich spadku.

Słowa kluczowe: rozwój, rolnictwo ekologiczne, USA

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AGRITOURISM AS A FORM OF BUSINESS ACTIVITY IN RURAL AREAS

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Abstract. Entrepreneurship, perceived as the fourth production factor, contributes to the growth and development of economies. In rural areas, business activity can be pursued in many fields, although most are to some extent connected with farming and farmsteads. Agritourism is the type of a non-farm business activity that has been gaining popularity over the recent years. The objective of this paper has been to identify the motivation driving farm owners to become involved in agritourism and the benefits they derive from this business. The considerations are based on information obtained through interviews with owners of agritourism farms in the Province of Warmia and Mazury. Among the reasons for undertaking agritourism, the dominant one was to derive additional income. However, almost 72% of the examined farmers indicated that the extra income from agritourism did not exceed 30% of the farm's total revenue. Income was also most often indicated (79.84% replies) as a benefit from running an agritourism farm. Besides, many respondents claimed that agritourism contributed to the activation of rural populations (58.06% replies) and helps to spread the spirit of entrepreneurship (44.35% replies).

Key words: agrotourism, rural areas, entrepreneurship

INTRODUCTION

The contemporary theory of entrepreneurship claims that no other activity is as complex and as difficult to describe and explain, or sometimes even to verbalize, as the work of an entrepreneur [Jaremczuk 2012]. In macroeconomics, the role of entrepreneurship regarded as a prerequisite of economic growth [Schmitz 1989] became demonstrably visible during the transformation of the Polish economy.

On the one hand, entrepreneurship involves being able to skillfully adjust to or even take advantage of the existing conditions; on the other hand, it means undertaking activities for the sake of changing the said conditions in a desirable direction. What is vital for the pursuit and execution of any business goal is the human activity, which is manifested

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by a business-like approach [Kowalski 2006]. Agritouirsm is the form of business which fulfills an important economic need and creates an opportunity of development for many, especially smaller farms [Marks-Bielska, Babuchowska 2013].

Agritourism as an economic, social, cultural and spatial activity encompasses elements which stimulate the local development. The economic and social effects of the growth of agritourism as an alternative to mass tourism are relatively small but they enable harmonious incorporation of agritourism farms into the economic and social life of a community. Among the agritourism functions and derived benefits, the most commonly implied and most important ones are: additional income earned by agritoursim farm owners and other villagers, stimulation of economic initiatives and creation of new jobs, reduction of unemployment, occupational activation of women in the countryside, improvement of the rural technical infrastructure, transfer of capital from cities to villages [Zawadka 2013]. Moreover, agritourism is often treated as a key component in strategies for local development and in programmes for the economic activation and restructuring of rural areas [Ciepiela, Sosnowski 2012].

What stimulates and governs the development of agritourism is the economic need felt by residents of rural areas. On the other hand, the growth of agritourism depends on needs of town residents, which are main beneficiaries of agritourism services [Ciepiela, Sosnowski 2012]. The activation and development of the countryside and agriculture owing to agritourism are perceived mainly as resulting from better opportunities of earning an off-farm income. Agritourism as a form of business activity attracts farm operators because of economic considerations (an additional source of income), organizational and legal reasons (development of agritourism is encouraged by agritourism associations, agricultural advisory centres, favourable legal solutions), social (town residents feel a growing need to spend free time in safe and socially accessible rural environment) and ecological aspects (more and more tourists desire contact with clean and healthy nature in rural areas) [Sikora 2012]. All tourism programmes are important not only for tourists, but are also particularly important for the inhabitants of a given area. They provide jobs, additional sources of income and improved professional skills [Batyk, Smoczyński 2010].

Not so long ago, back in the 1980s, agritourism in Poland could not develop dynamically, mainly because of the poor rural infrastructure, discouraging conditions experienced by farmers such as low revenue and complete lack of help from the state. This changed in the early 1990s, when agritourism gained importance because the political and economic transformations in Poland stimulated the search for new development directions in the Polish countryside and new sources of income, also from off-farm business activity. At present, agritourism is a dynamically developing branch of the tourism industry, which is seen by farmers as a potential chance to partly alter the function of farms [Górecka 2011].

Agritourism can be a convenient diversification strategy. It does not call for high investment into the farm's infrastructure, machinery or labour. Farms which cater for tourists can focus on such activities which rely on the existing resources and do not demand any additional investment [Tew, Barbieri 2012].

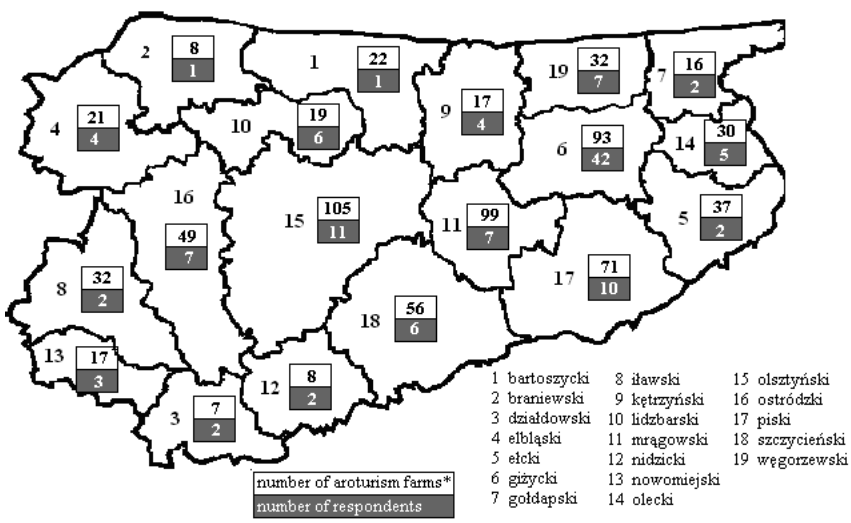
By stimulating entrepreneurship among farmer families who possess adequate resources to undertake an effort and convert their farms to host tourists, with some sup-

port given by the local government and leaders, the financial situation of those families may improve, which in the long run may translate into a stronger growth of rural areas [Górecka 2011].

MATERIAL AND METHODS

As demonstrated by a study of Sikora [2012], the development of agritourism in Poland is determined by both objective factors, related to the demand and supply situation, and subjective conditions, such as the awareness of farm owners and countryside residents, motivated mainly by the supply aspect of agritourism. Agritourism is intrinsically connected to the natural environment and growing demand for high quality values of natural landscapes. Agritourism customers look for peace and quiet, pure water, beautiful landscapes and active recreation in close contact with nature. The natural environment is therefore one of the dominant attributes of agritourism [Ciepiela, Sosnowski 2012].

The purpose of this study has been to discuss the reasons why some farm owners undertake agritourism as a form of business activity in rural areas and how they benefit from this type of entrepreneurship, especially in respect of economic effects. The study was based on a review of relevant references and own research, which covered 124 agritourism farms in the Province of Warmia and Mazury, whose geographical distribution is illustrated in Figure 1. The research was conducted in 2011, but the gathered data referred to the preceding year – 2010. The source material was collected using the direct interview method. A questionnaire addressed to farm owners was used as a research tool.



*numer of agroturism farms registered in the farms database conducted by the the Warmia and Mazury Agricultural Advisory Centre in Olsztyn, website: <http://www.agroturystyka.warmiamazury.net, information on 01.07.2013.

Fig. 1. Location of agroturism farms and respondents in the Province of Warmia and Mazury

Source: Author's elaboration based on surveys and information Warmia and Mazury Agricultural Advisory Centre in Olsztyn.

The Polish countryside is characterized by the rich nature and beauty of landscapes. However, the tourist assets are not distributed evenly among all regions of the country. According to Drzewiecki [1995], 1,368 Polish communes (covering 66% of the total surface area of Poland) possess conditions suitable for the development of agritourism, with the Province of Warmia and Mazury coming first on the list of attractive destinations. This region is endowed with high quality nature and landscape values – it has numerous lakes, rich wildlife and relatively unpolluted and unspoilt environment. However, some parts of the region are richer in wild nature forms and elements than others [Brodzińska 2012].

Among the principal components of the natural environment which are attractive for tourists, there are: surface waters, vegetation cover, climate and land relief. The highest value is assigned to surface waters, as a spatial analysis of the tourist flow distribution in Poland shows: about 50% of holidaymakers rest near water bodies, about 30% travel to the mountains and 20–30% choose other destinations [Dubel 2002].

As the data in Table 1 show, the highest share of land near lakes or rivers can be found in the districts of Węgorzewo, Giżycko, Mrągowo and Pisz. In turn, the most favourable conditions with respect to the forest cover are in the districts of Szczytno, Pisz and Nidzica. In several districts across the province (Gołdap, Giżycko, Węgorzewo, Mrągowo), there is a high percentage (over 60%) of legally protected areas with unique nature values. According to Dubiel [2002], villages which comprise some spatial forms of nature protection (national parks, landscape parks, protected landscape areas) are particularly suitable for the development of various forms of tourism, including agritourism.

The above-mentioned data implies which districts which – owing to natural values – are particularly suited to develop agritourism. These are the districts of Giżycko, Mrągowo, Pisz and Węgorzewo.

The information collected by the Agricultural Advisory Centre in Warmia and Mazury, which keeps a database of agritourism farms, shows that most such farms are run in the districts of Olsztyn (105), Mrągowo (99), Giżycko (93) and Pisz (71) – Figure 1.

The above justifies the conclusion that agritourism in the Province of Warmia and Mazury indeed accumulates in the districts which represent the best conditions for the development of this type of business activity. The only exception is the District of Olsztyn, where numerous agritourism farms may be established because of the proximity to the capital of the province – Olsztyn.

Many farmers treat agritoursim as an additional source of income, and the farms they operate specialize in specific production. The structure of the analyzed farms contained a large share of farms with plant and mixed production (20.16%). There were fewer dairy farms (14.52%), farms with permanent plantations (12.90%) and horticultural farms (8.87%). Noteworthy was the number of farms (7.26%) which did not pursue any form of farming. Their main source of income were ill-health or old-age pensions of farmers or their spouses.

Women prevailed (64.52%) among the persons operating the examined agritourism farms. The structure of the respondents was dominated by the age group of over 40 years of age (43.55% were 41–50 years old, 33.06% – 51–60 years old, 12.10% – over 60 years old) and persons with secondary and higher education: 45.97 and 40.32%, respectively.

Table 1. Selected components of the natural environment influencing the tourist attractiveness of districts

District	Area	Share of areas under water	Forestcover	Legally protected areas possessing unique environmental value
	km^2	%		
Bartoszycki	1 307	0.8	23.5	19.7
Braniewski	1 202	6.1	25.6	30.3
Działdowski	954	1.6	28.7	38.2
Elbląski	1 416	9.5	19.1	40.8
Ełcki	1 113	7.5	21.9	50.3
Giżycki	1 120	13.4	25.8	69.2
Gołdapski	772	1.4	32.0	78.5
Iławski	1 385	6.1	26.5	42.9
Kętrzyński	1 213	1.6	16.6	21.8
Lidzbarski	925	1.5	27.3	24.2
Mrągowski	1 065	12.3	31.4	60.5
Nidzicki	961	1.6	38.7	57.9
Nowomiejski	694	2.9	21.0	35.3
Olecki	874	3.9	25.9	40.0
Olsztyński	2 837	4.6	37.7	54.3
Ostródzki	1 766	5.7	29.8	56.0
Piski	1 775	10.4	48.7	58.0
Szczycieński	1 933	3.8	49.5	44.2
Węgorzewski	693	13.5	20.4	65.8

Source: Author's elaboration based on date from Turystyka w województwie warmińsko-mazurskim w 2011 r. Urząd Statystyczny Olsztyn 2012.

THE THEORETICAL FOUNDATIONS OF ENTREPRENEURSHIP

The subject literature distinguishes three main currents in research on entrepreneurship. The first one, according to which entrepreneurship is associated with the ability to take risk in a market activity, originates from the theory elaborated by F. Knight (the 1920s). Knight believed that a businessman is ready to undertake risky actions aimed at generating profit under the conditions of uncertainty. The risk in business is a consequence of an uncontrollable change. In turn, the change is not initiated by the business process but used by a businessman to achieve his own goals. The earned profit is treated as compensation for uncertainty [Kowalski 2006].

The second current is associated with J. Schumpeter (the 1930s), considered to be the author of the best-known and most complete concept of entrepreneurship, equated with the innovative attitude of an entrepreneur, seen as a creator of an enterprise who contributes to the economic progress. In order to become an entrepreneur, one needs to demonstrate the ability to secure necessary means and capital. The role of an entrepreneur is to use accurately results of the creative work of inventors. According to Schumpeter, the basic functions of a businessman are: introduction of new products and implementation of

new production methods, development of new markets, formation of new sources of supplies and reorganization of new industrial structures. In this approach, an entrepreneur is above all an innovator. The innovativeness of entrepreneurs is particularly evident when they attain goals no-one has thought of before or when they design novel ways of reaching more obvious aims. Thus, an entrepreneur is anyone who undertakes new activities or transforms certain enterprises into new ones. The work performed by entrepreneurs is the driving power of many outstanding economic events [Grzybek 1998].

The third current is associated with I.M. Kirzner (second half of the XX century), who emphasized the role of an entrepreneur in obtaining and using information, and treated a businessman as an individual who responded to changes on the market. Kirzner [1973] defined entrepreneurship as the readiness to take advantage of chances that had previously gone unnoticed.

As underlined by Kraśnicka [2012], a review of the existing research output of the theories and concepts most firmly rooted in the human cognition justifies the conclusion that entrepreneurship is primarily equated with:

- noticing, uncovering and using chances/opportunities in one's surroundings, irrespective of the resources one controls;
- performing innovative undertakings, creating new organizations and enterprises which revitalize the organization;
- creating new values.

After some period of concentrating on Schumpeter's claim that entrepreneurs (for example by being innovative) distort the equilibrium on markets, a time has come to think about entrepreneurs as individuals who can help to maintain balance in an environment struck by chaos and turbulences [Mikulska 2011]. The Polish literature dealing with this subject revealers an interdisciplinary approach to the above problem. Discussions on the nature of entrepreneurship are conducted by sociologists, psychologists, economists and representatives of the management sciences. In the economic approach, entrepreneurship is treated as the fourth production factor, which manifests itself in the field of rationalization and creative application of innovative solutions, resulting in a more effective use of current as well as the creation of new and more perfect resources [Kowalski 2006].

Rural tourism and agritourism in particular are examples of such novel type of activity versus the agricultural production traditionally conducted by farmers. Agritourism is perceived as a field ensuring many possibilities to diversify the economic situation of rural areas. It can create better opportunities to employ the countryside's production resources to and improve income of rural populations [Wilkin 2003].

Agritourism is the type of tourism, but it is also an example of off-farm activity in rural areas, which has been undergoing a dynamic growth over two decades. While highlighting the impact of agritourism on the enlivened economic and social life on rural areas, it seems reasonable to undertake complex studies of this branch of tourism [Zawadka 2013].

Entrepreneurship has at least two meanings. On the one hand, it is the term corresponding to an economic process, which consists of creating new, typically small and medium businesses. On the other hand, it is also a characteristic of the human nature, which distinguishes people's attitude and behaviour such as the capability and readiness of taking a risk, the tendency towards innovative actions and the habit of undertaking actions in order to catch chances and opportunities [Sawicka 2000].

RESULTS OF OWN RESEARCH

The surplus of labour in rural areas in Poland compared to other branches of the national economy encourages many farm owners to look for additional sources of income. As a result, they often undertake off-farm business activity in such areas as forestry, fisheries, industry, trade, transport and agritouirsm. This tendency has become a part of the multi-functional and sustainable development of rural areas, which at present is considered one of the basic categories of policy designed for agriculture and rural areas. As highlighted by Sikorska-Wolak [2010], this model attaches much importance to the tourist function, the development of which is supported by numerous and various benefits achieved by both service providers and whole communities in rural areas.

In the light of the author's own research, the respondents most often indicated the wish to have an additional source of income as the reason why they were engaged in agritourism (Fig. 2). However, the contribution of income generated by agritourism to the total income on a farm was relatively small, namely less than 10%, on many of the examined farms (32.26%). A slightly larger group of respondents (39.52%) indicated that this income contributed over 10% but less than 30% to the total farm's revenue. However, there were also farmsteads where the share of income generated by agritourism exceeded 70% of the total revenue. The level of profits derived from agritourism depends on a pricing policy specific for this branch of tourism. Prices at agritourism farms compared to traditional hotels and guest houses are relatively low. This pricing strategy is due to the fact that holidaymakers who choose take agritouirsm are typically less affluent. Also, a growing number of agritourism farms and competition between them keep prices low, which in turn reduces the profit and questions its importance [Sikora 2012].

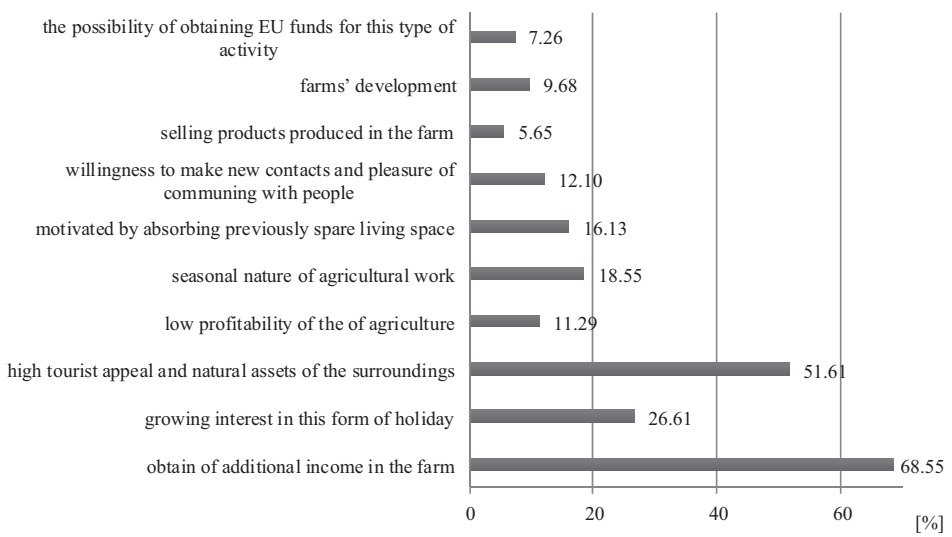


Fig. 2. Reasons of agritourism activity
Source: Author's elaboration based on surveys.

The Province of Warmia and Mazury is rich in values and assets useful for the tourism industry. This aspect is recognized by the owners of the examined farms, over half of which (51.61%) indicated the high tourist appeal and natural assets of the surroundings as a reason for undertaking the agritourism activity. In turn, 26.61% of the farm owners pointed to the growing interest in this form of holiday as a stimulus.

Income is most often chosen as a benefit derived from running a farm open to visitors (79.84% replies) although it is not the only advantage to this type of activity in rural areas (Fig. 3). It is difficult to predict all possible benefits, and some are not material or measurable ones, but translate to better living conditions. Obviously, the development of tourism in the countryside means that local economies become more diverse and less vulnerable to some market instabilities, which is essential in typically agricultural regions [Sikorska-Wolak 2010]. More than half of the farm owners questioned (58.06%) agreed that activation of rural populations is another important benefit derived from agritourism.

Farming is characterized by seasonality, meaning that in some months of the year village residents are less active. Agritourism creates the opportunity to make use of the time free from work on farms, available labour resources and spare living space. Moreover, agritourism develops the sense of entrepreneurship in rural population (the fact noticed by 44.35% of the respondents) and supports local services and food processing (25% of the replies).

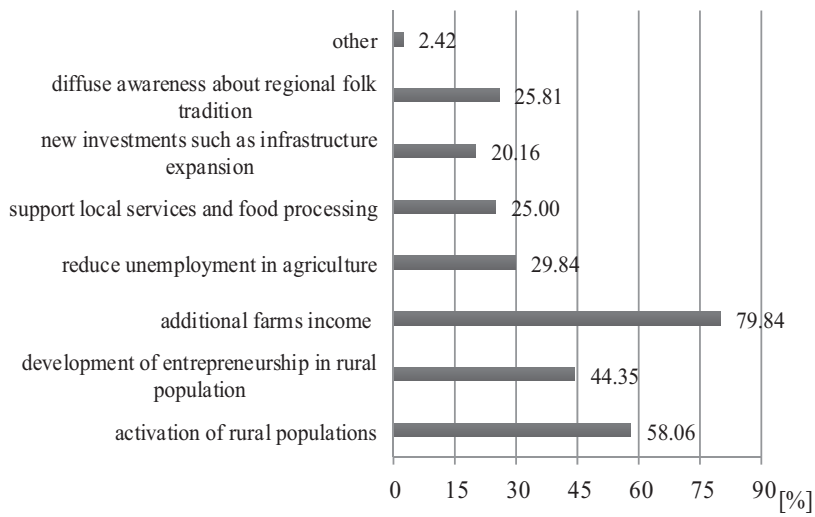


Fig. 3. The benefits of the agritourism development
Source: Author's elaboration based on surveys.

The opportunities to become engaged in agritourism are restrained by a series of obstacles, among which the respondents most often named financial barriers (46.77% answers). Most of the farm owners initially funded their agritourism business with their own money and tried to overcome the shortage of funds by taking bank loans. Some also applied for the European Union's funds. A high percentage of respondents (35.48%) have

argued that for a region with high tourist appeal the Province of Warmia and Mazury is not sufficiently promoted, as a result of which the number of holidaymakers staying on agritourism farms is much smaller than their capacity. Thus, farm owners must demonstrate a high level of entrepreneurship, creativity and inventiveness to reach potential guests.

There are certain beliefs deeply rooted in the awareness of many farmers which stop them from being more open in offering their businesses to non-rural populations and in facing the risk it involves. Farmers are also unwilling to gain or improve professional skills in this area of business (for example, by participating in training sessions). It is therefore crucial to change attitudes of farmers, who believe that their subsistence depends on the work at farming and on farmland, which is less productive when turned to other uses than agriculture.

With all positive functions of agritourism, one must not forget some of its negative consequences, called disfunctions. Like any other activity pursued by man, tourism can generate adverse effects, for example conflicts between tourists and local residents, the feeling of being underprivileged and unhappy among rural populations due to the overly manifested behaviour of rich visitors from towns etc. [Dubel 2002].

CONCLUSIONS

Economically speaking, entrepreneurship can be treated as the fourth production factor, which reveals itself in the areas of rationalization and creative use of innovative solutions and leads to a better use of the other three factors. In the rural areas of the Province of Warmia and Mazury, the unique values of the region are taken advantage of in order to develop agritourism. Agritourism, as one of the forms of entrepreneurship undertaken by rural populations, enables them to fully exploit the resources that the countryside is endowed with.

Among the most significant reasons for undertaking a business activity in agritourism the dominant ones are economic considerations, such as the opportunity to earn higher income. This fact was pointed to by the questionnaire respondents as the most important benefit derived from this type of business activity (68.55% replies). Besides, over half of the respondents (51.61%) decided to go into agritourism encouraged by the high tourist appeal of the region and its natural qualities. The Province of Warmia and Mazury comprises numerous lakes, rich plant cover and wildlife, almost untransformed landscapes and unpolluted areas. However, such nature qualities which favour the development of agritourism are not distributed evenly across the whole province. They are more densely concentrated in the districts of Giżycko, Mrągowo, Pisz and Węgorzewo.

Conducting a farm which hosts tourists generates many benefits, both for given farm owner and – more broadly – for a whole local community. The respondents mostly focused on the income-side of this business activity. Nearly 80% of the farmers questioned agreed that the chance to earn an additional profit was advantageous. However, many pointed to other types of benefits, such as the activation of rural populations (58.06%), development of entrepreneurship in the countryside (44.35%), promotion of folk traditions (25.81%). In the context of numerous benefits which the respondents observed, it

can be expected that, despite certain barriers encountered while undertaking or running an agritourism enterprise, this form of business will continue to grow on the rural areas of Warmia and Mazury.

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AGROTURYSTYKA JAKO FORMA DZIAŁALNOŚCI GOSPODARCZEJ NA OBSZARACH WIEJSKICH

Streszczenie. Przedsiębiorczość, uznawana za czwarty czynnik produkcji, przyczynia się do wzrostu i rozwoju gospodarek. Na obszarach wiejskich ta forma aktywności może być podejmowana w wielu dziedzinach bardziej lub mniej związanych z gospodarstwem rolnym. Zyskującą na popularności pozarolniczą formą przedsiębiorczości jest agroturystyka. Celem opracowania było ukazanie przesłanek skłaniających właścicieli gospodarstw rolnych do prowadzenia agroturystyki oraz korzyści wynikających z tej działalności. Podstawą rozważań były dane pierwotne pozyskane metodą wywiadu bezpośredniego przeprowadzonego z właścicielami gospodarstw agroturystycznych z województwa warmińsko-mazurskiego. Wśród przyczyn podjęcia działalności agroturystycznej dominowała chęć uzyskania dodatkowego dochodu. Jednak w prawie 72% badanych gospodarstw udział dochodu z agroturystyki w całkowitych dochodach gospodarstwa nie przekroczył 30%. Aspekt dochodowy wyraźnie przeważał także (79,84% wskazań) wśród korzyści wynikających w prowadzenia agroturystyki. Ponadto wielu respondentów uznało, że agroturystyka przyczynia się do aktywizacji ludności wiejskiej (58,06% wskazań) oraz rozwija w niej przedsiębiorczość (44,35% wskazań).

Słowa kluczowe: agroturystyka, obszary wiejskie, przedsiębiorczość

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MULTIDIMENSIONAL ANALYSIS OF SOCIAL AND ECONOMIC DEVELOPMENT OF SOME COUNTIES IN MAZOVIA VOIVODESHIP

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Abstract. The work reports an application of standardised sums to assess the social and economic development of some counties in Mazovia Voivodeship in the year 2012. A total of 37 counties, belonging to 5 subregions according to the NUTS-3 classification, were included in the study. They represent the following subregions: Ciechanów-Płock, Ostrołęka-Siedlce, Radom, Warsaw East and Warsaw West. County towns/cities were excluded from the analysis. At the first stage, development of the counties located in these subregions was assessed in terms of population, economic and infrastructure development as well as standard of life of inhabitants. The second stage encompassed analysis of the counties in terms of all the criteria within these areas. The study demonstrated substantial socio-economic development disparities. Counties located in the proximity of the Warsaw agglomeration are highly developed in social and economic terms whereas those located at the voivodeship's boundary are poorly developed with respect to all the areas included in the study.

Key words: Mazovia Voivodeship, county, multidimensional method, zero unitarisation

INTRODUCTION

Mazovia Voivodeship is the largest unit at the NUTS-2 level in Poland in terms of both area and population. Against the background of other NUTS-2 voivodeships, it is highly developed in social and economic terms but also characterised by the greatest development disparities between its counties [Kudełko 2002, Kołodziejczyk 2012, Wojewódzka-Wiewiórska 2013]. This is due to an increasing gap between the Warsaw agglomeration plus the counties surrounding the capital, and the remaining counties, particularly those located in rural areas [Grosse 2004, Przeglądy terytorialne OECD 2008]. Many counties located further away from the centre of the voivodeship or at the boundary with other voivodeships have been struggling with low activity in the labour market, a high

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percentage of permanently unemployed people and high unemployment rate. The disparities are historically rooted or result from development differences between cities and peripheral areas [Gorzelak 2002].

Social and economic growth is one of indicators of a region's development. It is a process of positive social changes including both the qualitative and quantitative increase which leads to enhanced welfare of the inhabitants [Parysek 2001, 2008, Parysek and Stryjkiewicz 2003, Szlachta and Woźniak 2007, Kamińska and Janulewicz 2009]. According to Hryniewicz [2000], socio-economic development is a sequence of economic and social phenomena which, when evaluated based on the available knowledge, can be classified as more beneficial to a given community than others. Kupiec [1995] has claimed that development should be looked at from the standpoint of the following eight interrelated aspects: social, economic, technical, technological, spatial, natural, aesthetic and temporal. Regional economy modernity, diversity and innovativeness, spatial planning quality, level of infrastructure development and human capital are the factors which may stimulate a region's development. Then, they are capable of generating offers which find recipients on international markets, too [Sokołowicz 2008].

Differences in the development of regions have become a very important research trend in present-day economic as well as geographical/economic studies [Gaczek 2000, Henley 2005, Malaga and Kliber 2007, Michałek 2007, Churski 2008, Wójcik 2008, Dolata 2009, Łaźniewska and Górecki 2012]. Various methods are applied to study this phenomenon taking into account its multidimensional character, in particular methods of multidimensional comparative analysis (MCA). The analysis yields a synthetic measure which replaces a multi-indicator description of objects with one synthetic variable, making it possible to precisely determine the level of development of individual administrative division units [Strahl 2003, Bombik and Marciniuk-Kluska 2010, Hydzik 2012].

The objective of this work was to classify Mazovia Voivodeship counties in terms of their social and economic development, and to rank the counties taking into account a set of traits describing them, using the multidimensional comparative analysis and applying zero unitarisation as a normalisation procedure.

MATERIAL AND METHODS

Data for analysis was obtained from the Main Statistical Office (GUS) Regional Data Bank. The data describes Mazovia Voivodeship in 2012 according to four areas: population development, standard of life of inhabitants, economic development and technical infrastructure. County towns/cities (Warszawa, Siedlce, Płock, Radom and Ostrołęka) were excluded from analysis. A total of 37 counties representing 5 NUTS-3 subregions: Ciechanów-Płock, Ostrołęka-Siedlce, Radom, Warsaw East and Warsaw West, were examined. Diagnostic variables to describe the level of development of individual counties were chosen applying the following three basic criteria: technical – established based on literature on the subject [Strahl 1998, Broszkiewicz 1999, Strahl 2000, 2006, Pomianek 2010], formal – it was checked if the data was measurable, complete and available, and statistical – only variables with coefficients of variation greater than 10% or not significantly correlated were chosen. The final analysis included the following diagnostic traits representing individual areas:

- population development: X_1 – permanent migration rate of working age inhabitants per 10,000 working age persons, X_2 – number of working-age persons, X_3 – birth rate per 1,000 persons;
- standard of live of inhabitants: X_4 – average monthly earnings gross (PLN), X_5 – proportion of pre-school children in the total number of children aged of 3–5 (%), X_6 – number of GP surgeries per 10,000 inhabitants, X_7 – proportion of expenditures on public roads in the total expenditures (%), X_8 – residential floor surface per 1 person (m^2), X_9 – education expenditures (PLN per 1 inhabitant), X_{10} – expenditures on culture (PLN per 1 inhabitant);
- economic development: X_{11} – registered unemployment rate, X_{12} – investment outlays per 1 working age inhabitants (PLN), X_{13} – proportion of outlays invested in industry and construction in the total outlays (%), X_{14} – proportion of outlays invested in trade, transportation, information and transport in the total outlays (%), X_{15} – number of national economy subjects recently REGON registered per 10th working age persons;
- technical infrastructure: X_{16} – public roads per 100 km^2 paved roads, measured in length, X_{17} – proportion of people with access to sewer system per inhabitants in total (%), X_{18} – proportion of people with access to gas per inhabitants in total (%).

The method of standardised sums was applied to examine the variation in the level of socio-economic development of Mazovia Voivodeship counties. The procedure belongs to a group of linear ordering methods which organise objects in a descending order from the best to the worst in terms of a given complex phenomenon. Prior to ordering, the data had to be normalised to make it comparable. The zero unitarisation method was applied to this end because, according to Kukuła [2012], this is the best procedure to normalise quantitative traits. The nature of the variables was determined using unemployment rate as a destimulant and the remaining variables as stimulants. Determination of stimulant and destimulant values was based on the following formulas [Kukuła 2000, Bal-Domańska and Wilk 2011]:

$$z_{ij} = \frac{1}{b_i - a_i}(x_{ij} - a_i) \text{ for the stimulants and}$$

$$z_{ij} = \frac{1}{b_i - a_i}(b_i - x_{ij}) \text{ for the destimulants,}$$

where: z_{ij} – normalised value of the i-trait and j-county (i = 1, ..., 18, j = 1, ..., 37);
x_{ij} – value of ith trait for the j-county (i = 1, ..., 18, j = 1, ..., 37);
a_i – minimum value of the i-trait,
b_i – maximum value of the i-trait.

The values of the normalised variables were used to calculate a synthetic measure (aggregated estimate) according to the formula:

$$q_i = \frac{1}{s}\sum_{i=1}^{s} z_{ij}$$

where: s – number of variables included in analysis.

The values of the synthetic measure (q_i) were used to make a ranking of counties. Additionally, the counties were divided into four groups based on the arithmetic mean and ($\overline{q}$) and standard deviation (s_q), of the synthetic measures in the following way:

- Group 1: $q_i \geq \overline{q} + s_q$;
- Group 2: $\overline{q} \leq q_i < \overline{q} + s_q$;
- Group 3: $\overline{q} - s_q \leq q_i < \overline{q}$;
- Group 4: $q_j < \overline{q} - s_q$.

Groups 1 and 2 were assumed to be, respectively, very highly and highly developed counties. Group 3 characterised by an average level of development, which in Group 4 was the lowest thus reflecting the worse situation.

Analysis of the social and economic development of the counties was made using data for 2012. The analysis was carried out for each area and in terms of all the diagnostic variables to more fully present the issue in question.

DISCUSSION

Mazovia Voivodeship counties were quite diversified in terms of the values of variables examined in 2012 (Table 1). The counties were most diversified with respect to the permanent migration rate and birth rate. The most people emigrated from Łosice County and birth rate was the lowest in Sokołów Podlaski County. The highest positive migration rate was for Piaseczno County and the greatest birth rate for Wołomin County. There were also substantial differences in expenditures on culture and investment as well as access to gas. The counties were most similar when it comes to average monthly earnings gross (from PLN 2,670 in Mława County to PLN 4,402 in Pruszków County), proportion of pre-school children (from 40.1% in Ostrołęka County to 84.2% in Piaseczno County) and residential floor area per 1 person (from 23.4 m^2 in Radom County to 39.1 m^2 in Warsaw West County).

Table 2 presents classification of the counties with respect to population development. Based on the synthetic variable, the following five counties were found to be the most developed: Wołomin, Piaseczno, Legionowo, Pruszków and Mińsk. They represent either the Warsaw East Subregion or the Warsaw West Subregion. The counties were characterised by a positive birth rate and a high permanent immigration rate. Values of these variables were much higher than their respective averages for the voivodeship.

The last group, with a low level of population development, comprised two counties: Lipno (Radom Subregion) and Łosice (Ostrołęka and Siedlce Subregion). Their birth rate was much lower than the average and their migration rate was negative and much higher than the average.

Piaseczno, Grójec and Pruszków, Grodzisk, Grójec and Warsaw West County, representing the Warsaw West Subregion, and Lipsk County from the Radom Subregion, were characterised by a high standard of life of their inhabitants (Table 3). Piaseczno County, which was ranked first, had the greatest average residential floor surface per 1 person (38 m^2) and the greatest percentage of pre-school children in the total number of children aged of 3–5 (84.2%). Pruszków County, which was ranked second, had the highest average monthly earnings gross (PLN 4,402), a high percentage of pre-school children

Table 1. Basic characteristics of the diagnostic variables included in analysis

Variable	$\overline{x}$	x_{min}	County	x_{max}	County	V (%)
X_1	1.56	–74.10	Łosice	139.80	Piaseczno	3 765.84
X_2	56 063.81	21 046.00	Łosice	151 374.00	Wołomin	51.92
X_3	63.00	–181.00	Sokołów Podlaski	895.00	Wołomin	355.43
X_4	3 324.32	2 670.07	Mława	4 402.16	Pruszków	12.49
X_5	61.95	40.10	Ostrołęka	84.20	Piaseczno	18.38
X_6	3.84	2.00	Radom, Zwoleń	6.00	Łosice	22.58
X_7	6.11	2.60	Legionowo	14.30	Ciechanów	39.78
X_8	27.64	23.40	Radom	39.10	Warsaw West	12.95
X_9	289.50	41.45	Siedlce	589.28	Przysucha	39.52
X_{10}	5.11	0.00	Gostynin, Nowy Dwór Mazowiecki, Płońsk	61.02	Grójec	208.64
X_{11}	16.99	6.60	Warsaw West	38.00	Szydłowiec	40.39
X_{12}	3 437.41	671.30	Lipno	8 638.40	Nowy Dwór Mazowiecki	66.63
X_{13}	58.69	8.00	Szydłowiec	96.10	Kozienice	33.81
X_{14}	30.78	1.30	Kozienice	84.70	Szydłowiec	65.00
X_{15}	123.95	85.00	Kozienice, Siedlce	249.00	Piaseczno	30.42
X_{16}	84.71	52.00	Węgrów	265.10	Pruszków	41.00
X_{17}	42.78	21.30	Legionów	92.10	Łosice	35.42
X_{18}	26.28	0.00	Lipsko, Przasnysz, Żuromin	84.10	Pruszków	96.52

For variables X_1 ..., X_{18} see chapter Materials and Methods.
Source: Own calculations based on Main Statistical Office data.

Table 2. Grouping of counties in Mazovia Voivodeship in terms of their population development

Development	Value of synthetic variable	Counties
Very high	$q_i \geq 0.501$	Wołomin, Piaseczno, Legionów, Pruszków, Mińsk Mazowiecki
High	$0.283 \leq q_i < 0.501$	Warsaw West, Radom, Otwock, Grodzisk Mazowiecki, Płock, Nowy Dwór Mazowiecki, Ostrołęka
Average	$0.064 \leq q_i < 0.283$	Ciechanów, Garwolin, Gostynin, Grójec, Kozienice, Maków, Mława, Nowy Dwór Mazowiecki, Ostrołęka, Ostrów Mazowiecka, Płońsk, Przasnysz, Przysucha, Pułtusk, Siedlce, Sierpc, Sochaczew, Sokołów Podlaski, Szydłowiec, Węgrów, Wyszków, Zwoleń, Żuromin, Żyrardów
Low	$q_i < 0.064$	Lipsko, Łosice

Source: Own calculations.

(81.1%) and a higher-than-average residential floor surface per 1 person (32.7 m^2). However, education expenditures and expenditures on culture (in PLN per 1 inhabitant) were lower than the respective averages (149 and PLN 3.89, respectively). Of the counties with the highest standard of life of their inhabitants, Lipsk County had the highest education expenditures whereas Grójec County spent the most money on culture. The counties with the lowest standard of life included: Gostynin (Ciechanów-Płock Subregion), Ostrołęka

Table 3. Grouping of counties according to the standard of life of their inhabitants

Development	Value of synthetic variable	Counties
Very high	$q_i \geq 0.460$	Piaseczno, Pruszków, Lipsko, Grodzisk Mazowiecki, Grójec, Warsaw West
High	$0.351 \leq q_i < 0.460$	Legionów, Kozienice, Łosice, Garwolin, Otwock, Sokołów Podlaski, Ciechanów, Białobrzegi, Mińsk Mazowiecki, Przysucha, Sochaczew
Average	$0.242 \leq q_i < 0.351$	Maków, Węgrów, Wołomin, Pułtusk, Żyrardów, Nowy Dwór Mazowiecki, Przasnysz, Ostrów Mazowiecka, Mława, Wyszków, Sierpc, Płońsk, Siedlce, Żuromin, Płock
Low	$q_i < 0.242$	Gostynin, Ostrołęka, Szydłowiec, Zwoleń, Radom

Source: Own calculations.

(Ostrołęka-Siedlce Subregion) and Szydłowiec, Zwoleń and Radom (Radom Subregion). In most cases, the values of the diagnostic variables obtained for these counties were lower than the respective averages for their voivodeships. An exception to this rule was noted for education expenditures in Gostynin County (app. PLN 317) and proportion of expenditures on public roads in the total expenditures in Gostynin and Ostrołęka (7.7 and 7.9%, respectively).

Table 4 demonstrates counties classified according to the level of their economic development. The group of highly developed counties included the following four counties, representing the Warsaw West Subregion: Warsaw West, Grodzisk, Piaseczno and Pruszków, as well as two counties from the Warsaw East Subregion: Nowy Dwór Mazowiecki and Legionów. The most developed Warsaw West County had the lowest unemployment rate (6.6%), a large number of economic entities (app. 200) and high expenditures on investment per 1 inhabitant (PLN 7,686). The least economically developed counties included: Przysucha, Lipsko, Zwoleń and Radom Counties, located in the Radom Subregion, Maków County – in the Ostrołęka-Siedlce Subregion and Sierpc County – in the Ciechanów-Płock Subregion. The unemployment rate in these counties was much higher than the average for the voivodeship and the values of most diagnostic variables were lower than the average with an exception of expenditures on industry and construction, which was higher than the average in the following counties: Przysucha, Lipsko, Sierpc and Zwoleń.

Table 4. Grouping of counties according to the economic potential

Development	Value of synthetic variable	Counties
Very high	$q_i \geq 0.557$	Warsaw West, Grodzisk Mazowiecki, Piaseczno, Nowy Dwór Mazowiecki, Pruszków, Legionowo
High	$0.436 \leq q_i < 0.557$	Otwock, Ciechanów, Mława, Grójec, Wołomin, Sochaczew, Sokołów Podlaski, Wyszków, Kozienice, Żyrardów, Mińsk Mazowiecki
Average	$0.316 \leq q_i < 0.436$	Siedlce, Garwolin, Ostrów Mazowiecka, Łosice, Płońsk, Płock, Białobrzegi, Węgrów, Gostynin, Przasnysz, Ostrołęka, Żuromin, Pułtusk, Szydłowiec
Low	$q_i < 0.316$	Przysucha, Lipsko, Maków Mazowiecki, Sierpc, Zwoleń, Radom

Source: Own calculations.

Technical infrastructure was the most developed in the following counties representing either the Warsaw East Subregion or the Warsaw West Subregion: Pruszków, Wołomin, Otwock, Grodzisk and Warsaw West County. A low level of infrastructure development was found in Lipsko, Przysucha, Zwoleń (Radom Subregion), Płock (Ciechanów-Płock Subregion) and Sokołów Podlaski and Przasnysz (Ostrołęka-Siedlce Subregion) – Table 5. Pruszków County, which stands out against the remaining most developed counties, had the most developed technical infrastructure as the length of its local public roads per 100 km^2 paved road (265 km) and percentage of inhabitants with an access to gas (84%) were the highest. Values of the variables reflecting the development of technical infrastructure for Group 4 counties were much lower than the averages for the voivodeship.

Table 5. Grouping of counties according to the technical infrastructure

Development	Value of synthetic variable	Counties
Very high	$q_i \geq 0.410$	Pruszków, Wołomin, Otwock, Grodzisk Mazowiecki, Warsaw West
High	$0.259 \leq q_i < 0.410$	Piaseczno, Żyrardów, Grójec, Płońsk, Łosice, Kozienice, Legionowo, Mława, Białobrzegi, Garwolin, Szydłowiec
Average	$0.107 \leq q_i < 0.259$	Mińsk Mazowiecki, Ciechanów, Wyszków, Gostynin, Ostrów Mazowiecka, Żuromin, Radom, Sierpc, Węgrów, Nowy Dwór Mazowiecki, Pułtusk, Maków Mazowiecki, Sochaczew, Siedlce, Ostrołęka
Low	$q_i < 0.107$	Lipsko, Przysucha, Płock, Zwoleń, Sokołów Podlaski, Przasnysz

Source: Own calculations.

Key regional policy documents are drawn up at the national level. Such documents, e.g. the National Development Strategy 2007–2015 and the National Strategic Reference Framework 2007–2013, adopted in support of economic growth and jobs, put emphasis on differences in socio-economic development between the regions of a country. In Poland, disparities in the level of this development have been analysed by many authors [Gralak 2005, Iwańska and Bieńkowska 2010, Pomianek 2010, Bal-Domańska and Wilk 2011, Chrzanowska et al. 2013]. They usually applied multidimensional methods based mainly on linear ordering [Pomianek 2010, Adamowicz and Janulewicz 2012, Sampolska-Rzechuła 2013], cluster analysis [Migała-Warchoł 2012] or factorial analysis [Malina and Malina 2005].

The study discussed here, based on 37 Mazovia Voivodeship counties, demonstrated that the region is highly diverse in terms of population development, standard of life of the inhabitants, technical infrastructure and economic development. Population development can be described by a set of characteristics such as: birth rate, permanent migration rate of working age inhabitants per 10,000 working age persons, number of working-age persons. According to Murkowski [2012], the latter trait reflects labour resources which a territorial division unit has, and directly influences the unemployment rate. A high level of social and economic development was observed in counties with a high birth rate. Similar finding were reported by Jaworska and Luty [2009].

Of the analysed factors, education expenditures have been gaining importance as they condition completion of tasks set out by the Lisbon Strategy [Kompa 2009]. The present work has revealed that this variable does not directly affect the county's level of socio--economic development as exemplified by Przysucha County which, despite the highest education expenditures, was ranked almost the last. Social and economic development is directly linked to infrastructure development which defines regions' attractiveness for investment and stimulates further development. It was confirmed in the study discussed here that all the counties with a highly developed infrastructure were also highly developed in socio-economic terms. The work demonstrated that the following counties had the highest level of social and economic development: Piaseczno, Pruszków, Warsaw West, Grodzisk Mazowiecki, Wołomin, Legionów, Grójec and Otwock. The Mazovian Centre for Regional Surveys [2012] carried out a study to group counties of Mazovia Voivodeship and its neighbours into clusters characterised by a similar economic potential. The following counties were found to form one cluster of highly developed administrative units: Legionów, Grodzisk Mazowiecki, Piaseczno, Pruszków and Warsaw West. They had the highest birth rate, the highest average monthly earnings gross and a high positive migration rate. The unemployment rate for these counties was 1.8%. Moreover, the study revealed that peripheral areas of the Radom Subregion and Ostrołęka-Siedlce Subregion were the least developed because they were classified as belonging to Group 5 characterised by the least advantageous socio-economic situation, a negative birth rate (determined for this group only), a relatively high unemployment rate and a high percentage of the long-term unemployed.

RESULTS

Social and economic development is fostered by a number of factors and is multi--sided in character. As a result, examination of this type of development often makes use of methods of multidimensional comparative analysis, especially taxonomic methods which seem to be particularly well suited. Taxonomic methods enable comparisons of a set of multi-trait objects in terms of a synthetic criterion which is a function of these traits [Kola-Bezka 2012].

The multidimensional analysis of the demographic potential of the counties ranked Wołomin, Piaseczno, Legionów, Pruszków and Mińsk Mazowiecki in the top place, Lipsk and Łosice in the last place. The standard of life was the highest in Piaseczno, Grójec, Pruszków, Grodzisk and Warsaw West, the lowest – in Płock, Gostynin, Ostrołęka, Szydłowiec, Zwoleń and Radom. The highest values of the synthetic variable reflecting the economic aspect were obtained for the Warsaw West and Warsaw East subregions. They were the lowest for the Radom Subregion. The leaders of technical infrastructure development were as follow: Pruszków, Wołomin, Otwock, Grodzisk and Warsaw West County.

The socio-economic situation of Mazovia is good compared with the rest of the country due to the effect of the capital city. However, the actual situation of the Mazovia Voivodeship seems to be blurred [Bombik and Marciniuk-Kluska 2010] as the counties located in the immediate neighbourhood of Warsaw remain in sharp contrast to the poorly

developed counties situated on the edge of the Voivodeship. This indicates that the social and economic development of Mazovia Voivodeship counties is influenced by their geographical location defined as the distance of a county from the Warsaw agglomeration. According to Iwańska and Bieńkowska [2010] as well as Pomianek [2010], cities, which are main economic centres, determine the local development of the counties located in their neighbourhood. Substantial disparities among counties in Mazovia Voivodeship substantiate an occurrence of spatial polarisation processes which make the development differences between wealthy and poor areas even worse [Bański and Czapiewski 2008]. Counties located in the proximity of the Warsaw agglomeration make use of their potential and economic situation and reach a high level of social and economic development. By contrast, more distant counties situated on the edge of the voivodeship stagnate despite the supportive national economic policy and the European Union cohesion policy.

Multidimensional comparative analysis, which takes into account many factors affecting development, may be a useful method helping to assess the effectiveness of the tools used to manage a region. Reduction of disparities between counties is a measure of efficiency of actions undertaken by local authorities. In contrast, strengthening or increasing disparities within a region are indicative of inefficiency of the management in the region.

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WIELOWYMIAROWA ANALIZA SPOŁECZNO-EKONOMICZNEGO ROZWOJU WYBRANYCH GMIN W WOJEWÓDZTWIE MAZOWIECKIM

Streszczenie. W pracy przedstawiono zastosowanie metody sum standaryzowanych do oceny rozwoju społeczno-gospodarczego powiatów województwa mazowieckiego. Badaniem objęto 37 powiatów należących do pięciu podregionów: ciechanowsko-płockiego, ostrołęcko-siedleckiego, radomskiego, warszawskiego wschodniego i warszawskiego zachodniego. W pierwszym etapie dokonano oceny rozwoju powiatów pod względem: rozwoju społeczno-gospodarczego, infrastruktury i poziomu życia mieszkańców. Następnie przeanalizowano rozwój powiatów z uwzględnieniem wszystkich obszarów. Badania wy-

kazały, że między powiatami występują dość znaczące dysproporcje w rozwoju społeczno-gospodarczym. Powiaty leżące blisko aglomeracji warszawskiej osiągają wysoki stopień rozwoju społeczno-gospodarczego, zaś powiaty ościenne, leżące na granicy województwa, charakteryzują się niskim poziomem rozwoju we wszystkich badanych obszarach.

Słowa kluczowe: województwo mazowieckie, powiat, metoda wielowymiarowa, unitaryzacja zerowana

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ECONOMIC DEVELOPMENT OF RURAL AREAS IN EUROPEAN UNION MEMBER STATES IN 2000–2012

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Abstract. This paper focuses on the analysis of some certain aspects of economic development of rural areas in EU Member States during 2000–2012 and aims to define its main tendencies. The synthetic indicator, constructed on the basis of the primary variables, such as GDP per capita, cereal yield, livestock production index and agriculture value added per worker, has been used to evaluate rural economic development. While creating a synthetic indicator, factor analysis has been employed. The research covered all the countries of the EU. The results indicated that among them the highest level of rural economic development in terms of applied indicators occurred in Luxembourg, the Netherlands, Slovenia, France and Malta, and the lowest – by Lithuania, Romania, Slovakia, Poland and the Czech Republic.

Key words: rural development, synthetic indicator, European Union Member States

INTRODUCTION

Sustainable development of rural areas is determined by three dimensions: economic, environmental, and social. We will discuss economic components here, otherwise it should be noted that the measures, indicators and aims of all three dimensions overlap and influence each other, being interdependent no matter how diverse they are. For example, economic decisions made by farmers will definitely impact ecological and social components, whereas preserving environmental quality is a precondition for developing a lasting economic potential of rural areas.

Measuring features of rural economy requires defining the factors that determine its growth and became of great concern in recent decades. Table 1 presents various approaches to and definitions of economic development. Being more or less universal and setting economic development and economic growth against each other [Kindleberger

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Table 1. Selected definitions of economic development

Author(s) / Year	Definition / Description
Kindleberger and Herrick [1977]	Economic development means an increase in output of goods and services in the economy. It is more important than economic growth because economic development is more comprehensive process than economic growth. Economic growth is a quantitative term as it represents quantitative increase in the production of goods, services and factors of production, whereas economic development is a qualitative terms as it indicates continuous increase in real national income and structural changes in the economy of a country
Porter [1990]	Economic development is the long-term process of building a number of interdependent microeconomic capabilities and incentives to support more advanced forms of competition
World Bank. World Development Report [1991]	The challenge of development is to improve the quality of life (QOL). The improved QOL involves higher incomes, better education, higher standards of health and nutrition, less poverty, cleaner environment, more equality of opportunities, greater individual freedom, and a richer cultural life. It includes economic factors, such as capital, labour, natural resources, technology, established markets (labour, financial, goods)
Morse and Loveridge [1997]	Economic development can be defined as "a sustained community effort to improve both the local economy and the quality of life by building the area's capacity to adapt to economic change". This definition suggests a distinction between economic growth and economic development. Economic growth represents an increase in jobs and real income in the community. While economic development can involve job and income growth, it also involves sustainable increases in the productivity of individuals, businesses and resources to increase the overall wellbeing of residents and maintaining or even enhancing the quality of life
Harris [2000]	An economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and external debt, and to avoid extreme sectoral imbalances which damage agricultural or industrial production
American Economic Development council [2003]	Economic development aims to influence the growth and restructuring of a community's economy to enhance its wellbeing. This is achieved through: job creation and retention, wealth creation for individuals and businesses, tax base enhancements, and improving the quality of life
Labrianidis [2006]	Economic development of rural areas is closely associated with the interaction between the external environment and entrepreneurial agents, thus the key economic challenge for rural areas is how can a small number of entrepreneurial individuals adjust to and exploit the characteristics of their external environment
Dorward et al. [2009]	Economic development involves, inter alia, a process where technical and institutional changes with increasing specialization and trade shift supply and demand curves to the right and reduce transaction costs, increasing supply and demand (and their elasticities) and consumer and producer surpluses
Stanny [2011]	Economic component of sustainable development includes characteristics of the economic structure of communities, through the analysis of the agricultural and non-agricultural sector and characteristics of the prosperity of local governments and the labour market

Source: Grouped by the authors based on literature search.

and Herrick 1977, Morse and Loveridge 1997], some of those approaches, however, get concentrated on the components while the others – on tools and methods to be achieved with. Economic development has been described both as a process [Porter 1990, Dorward et al. 2009] and a prerequisite to life quality improvement [World Bank 1991, Morse and Loveridge 1997] with the wide range of macro- and microeconomic factors.

Despite the fact that given definitions of economic development represent the authors of different continents, from different scientific schools and cover considerable time in-

terval, evolving over time, all of them are relatively consistent in terms of its sustainability, aims, ways of achieving and integrity with two other components of sustainable development (environmental and social ones).

With over 56% of the population in the 27 Member States of the European Union living in rural areas, which cover 91% of the territory, rural economic development is a vitally important policy area. Farming and forestry remain crucial for land use and the management of natural resources in the EU's rural areas, and as a platform for economic diversification in rural communities. The strengthening of EU rural development policy is, therefore, an overall EU priority [European Commission… 2006]. The European Commission's Rural Development Policy is one of the two pillars of the Common Agricultural Policy (CAP). It helps to meet the challenges faced by rural areas and is expected to contribute to their sustainable development [Rural Development… 2012]. Thus sustainable development is one of the main purposes of EU, becoming a fundamental objective in 1997 when it was included in the Treaty of Amsterdam as an overarching objective of EU policies. At the Gothenburg Summit in June 2001, EU leaders launched the first EU sustainable development strategy based on a proposal from the European Commission [Communication from… 2009].

In line with document the Europe 2020 and the overall CAP objectives, three long--term strategic objectives for EU rural development policy for the period of 2014–2020 can be identified, namely:

- fostering the competitiveness of agriculture;
- ensuring the sustainable management of natural resources, and climate action;
- achieving a balanced territorial development of rural economies and communities including the creation and maintenance of employment [Rural Development Policy 2014–2020… 2013].

So what are the measures of rural economic sustainability? For example, some farms that utilize sustainable agriculture practices may be more profitable than their conventional farming counterparts, although the reverse can also be true. In addition to crop production methods, many other factors can affect the bottom line, including management, marketing skills, and experience [Sustainable Agriculture… 2012]. The same is true for the community and macroeconomic (both regional and national) level: wealthy countries may be characterized by lower level of sustainability by some certain parameters in comparison with developing ones, which could also be observed for other blocks of factors (environmental and social).

MATERIAL AND METHODS

The aim of present research is to determine the essence of the economic development of rural areas in each EU Member State during the period of 2000–2012. Only economic dimension of rural sustainability was taken into account in present study, using secondary data, namely: GDP per capita, cereal yield, livestock production index and agriculture value added per worker. The data set includes variables, which characterize both agriculture and rural areas.

A main research hypothesis states that higher economic development of rural areas is typical for Western European countries if to compare with those of Central and Eastern Europe.

Theoretical part of the paper is based on literature review (Table 1) and the empirical part is based on data obtained from the World Bank, OECD, European Commission statistics databases. To determine the economic development of rural areas in the EU Member States synthetic index has been built on the basis of abovementioned secondary variables. Factor analysis was used to replace the original set of primary variables, describing the development of rural areas, by a new set of secondary variables, more convenient for practical application.

Factor analysis was based on the study of interrelationships between variables in a multidimensional extend and to clarify the reasons for the general variability [Harman 1967, Bolch and Huang 1974, Morrison 1990, Jajuga 1993, Tadeusiewicz 1993, Dobosz 2001]. This analysis is based on a linear transformation of the original n-variables X_i (i = = 1, ..., n) to the new secondary t-variables U_k (k = 1, ..., t), which were mutually uncorrelated, and their variance sum equals total variance of the original variables X_i. Variables U_k were defined as main factors. The variance of each new factor explains certain variation value of the primary (original) variables and is represented by eigenvalue. Subsequently, isolated main factors indicated less variability every single time. The decision concerning definition the stage of termination isolating factors depended mainly on state of random variation, which remained undefined by the new factors. Three main factors were used to determine the synthetic index of rural economic development in the EU countries; those factors explained 86% of the total variation.

The value of the main factors and the value of the synthetic index of rural development in the EU countries have been calculated by the following equations:

$$U_k = a_{1k}x_1 + a_{2k}x_2 + a_{3k}x_3 + ... + a_{nk}x_n \quad (1)$$

where: U_k – value of the main k-factor (k = 1, 2, …, t);
a_{ik} – estimated significance of primary i-variable by the primary k-factor (i = 1, 2, ..., n);
x_i – value of primary i-variable (i = 1, 2, …, n);

$$W_s = b_1U_1 + b_2U_2 + b_3U_3 + ... + b_tUt \quad (2)$$

where: W_s – synthetic index of economic development of rural areas in the EU countries;
b_i – estimated significance of main k-factor, which reflects a certain percentage of variation (i = 1, 2, ..., t);
U_k – value of main k-factor (k = 1, 2, …, t).

As it was mentioned above, the study of the economic development of rural areas in the EU countries covered the period from 2000 to 2012. Rural development ranking of EU member states has been worked out for each year from the period based on the value of the synthetic index. All the results are presented in respective tables.

RESULTS

As a result of factor analysis of the four primary variables, three main factors, which make up 86.5% of the general variation, were defined. First, second and third factors reflected respectively 36, 25 and 24% of the total variation (Table 2). The first factor was influenced mostly by the following primary variables: GDP per capita and agriculture value added per worker, second factor – by cereal yield, and the third one – by livestock production index (Table 3).

Table 2. Factor analysis of economic development of rural areas in EU countries, 2000–2012

Factor	Eigen value	Percentage of variation	Cumulative percent
1	1.46	36.57	36.57
2	1.02	25.58	62.16
3	0.98	24.38	86.54
4	0.54	13.46	100.00

Source: Calculated by the authors.

Table 3. Factors which determine economic development of rural areas in EU Member States, 2000–2012

Primary variables	Cumulative percent = 86.54%		
	Factor 1	Factor 2	Factor 3
GDP per capita (current USD) – [x_1]	0.8550	0.0046	–0.0025
Cereal yield (kg per 1 ha) – [x_3]	–0.0108	0.9998	0.0123
Livestock production index (2004–2006 = 100) – [x_4]	–0.0048	0.0123	0.9999
Agriculture value added per worker (constant 2005, USD)	0.8545	–0.0201	–0.0044

x_i – value of primary i-variable (i = 1, 2, 3, 4); U_k – value of main k-factor (k = 1, 2, 3).
Source: Calculated by the authors.

By value of the first factor (GDP per capita and agriculture value added per worker[1]) Luxembourg, Slovenia and France have the highest ranking results, Poland, Romania and Latvia – the lowest (Table 4). Cyprus, Ireland and Belgium lead in terms of the second factor (cereal yield), the weakest are Finland, Slovenia and Malta. In the case of the third factor (livestock production index) Bulgaria, Latvia and the Netherlands dominated, and the worst were Slovakia, Lithuania and Greece.

On the whole in the European Union the highest level of rural development in terms of applied indicators had been held by Luxembourg, the Netherlands, Slovenia, France and Malta, and the lowest one – by Lithuania, Romania, Slovakia, Poland and the Czech Republic (Table 4).

Based on research results (Table 5) it is obvious that the highest economic development of rural areas takes place in Western European countries and the lowest one in the countries of Central and Eastern Europe. The Benelux and Scandinavian countries dominated among of the top ten states with the highest level of economic development in rural

[1]The names of those three factors (secondary variables) were derived from the names of primary variables that were most correlated with each of these factors.

areas. Relatively high positions of Slovenia and Malta in the ranking became unexpected to some extent. The second group of countries with the lowest economic development of rural areas can be distinguished as the post-communist countries of the "new EU". Comparing the average positions of the countries in the ranking for 2000–2012 with positions in 2012, it should be noted that the largest improvement in ranking has been recently occurred in Austria, Croatia, Estonia, Germany, Latvia, Lithuania, Poland and the United Kingdom, and the most significant worsening – in Belgium, Bulgaria, Cyprus, Greece, Hungary and Malta.

Table 4. Ranking of EU Member States based on the value of the main factors of economic development of rural areas, 2000–2012

Country	Factor 1	Rank	Factor 2	Rank	Factor 3	Rank	Synthetic index	Rank
Austria	0.5576	12	–0.0264	7	0.3057	6	0.2717	10
Belgium	1.2671	6	–0.0017	3	–0.4145	25	0.3619	8
Bulgaria	–1.5404	25	–0.0745	18	0.6055	1	–0.4348	19
Croatia	–1.0294	18	–0.0552	13	–0.2966	23	–0.4629	21
Cyprus	–0.7360	17	1.5954	1	0.0592	11	0.1534	15
Czech Republic	–1.3218	21	–0.0511	12	–0.2649	22	–0.5610	24
Denmark	1.2258	7	–0.0369	8	–0.1276	18	0.4077	6
Estonia	–1.4344	23	–0.0878	22	0.4160	4	–0.4456	20
Finland	1.3319	5	–0.1068	28	–0.2136	19	0.4077	7
France	1.6490	3	–0.0428	9	0.0416	13	0.6022	4
Germany	0.4488	13	–0.0179	6	0.3280	5	0.2395	11
Greece	–0.7043	16	–0.0695	16	–0.5038	26	–0.3982	18
Hungary	–1.3945	22	–0.0508	11	0.1848	9	–0.4779	22
Ireland	0.5708	11	0.0023	2	0.0502	12	0.2216	13
Italy	0.5895	10	–0.0599	14	0.1329	10	0.2327	12
Latvia	–1.6492	26	–0.0795	21	0.5864	2	–0.4805	23
Lithuania	–1.5245	24	–0.0911	24	–0.6049	27	–0.7283	28
Luxembourg	3.3710	1	–0.0481	10	–0.0224	17	1.2150	1
Malta	1.0186	8	–0.0989	26	0.2897	7	0.4178	5
Netherlands	1.5338	4	–0.0050	4	0.5766	3	0.7002	2
Poland	–1.6854	28	–0.0756	20	0.0253	15	–0.6295	25
Portugal	–1.0946	19	–0.0751	19	0.2655	8	–0.3548	17
Romania	–1.6737	27	–0.0902	23	–0.3223	24	–0.7137	27
Slovakia	–1.2395	20	–0.0718	17	–0.6526	28	–0.6308	26
Slovenia	1.9159	2	–0.1050	27	–0.2499	21	0.6128	3
Spain	0.1271	15	–0.0959	25	–0.0023	16	0.0214	16
Sweden	0.9989	9	–0.0663	15	–0.2291	20	0.2925	9
United Kingdom	0.4221	14	–0.0138	5	0.0371	14	0.1598	14

Source: Calculated by the authors.

Table 5. Ranking of EU member states based on the value of the main factors of economic development of rural areas, 2000–2012

Country	2000		2001		2002		2003		2004		2005		2006	
	synthetic index	rank	synthetic index	rank	synthetic index	rank	synthetic index	rank	synthetic index	rank	synthetic index	rank	synthetic index	rank
Austria	–0.0266	12	0.0623	8	0.0784	11	–0.0099	14	0.0818	14	0.1845	13	0.1599	13
Belgium	0.3950	4	0.3029	5	0.4321	4	0.3778	5	0.5048	4	0.3038	8	0.3773	8
Bulgaria	1.0272	3	0.7340	2	–0.3827	18	–0.8759	25	–0.6576	23	–0.6322	24	–0.5157	23
Croatia	–1.3323	28	–1.0488	25	–1.0393	26	–0.9643	26	–0.6609	24	–0.3388	18	–0.2701	16
Cyprus	4.4610	1	–0.2521	17	–0.1119	15	–0.1406	16	–0.1585	16	–0.2711	17	–0.4932	22
Czech Republic	–0.5622	20	–0.4470	19	–0.5329	21	–0.5978	22	–0.4239	19	–0.5183	22	–0.5919	26
Denmark	–0.0421	13	0.0516	9	0.1444	6	0.2871	6	0.4337	6	0.4410	5	0.4252	6
Estonia	–1.2175	26	–1.0434	24	–0.5790	23	–0.6225	23	–0.6545	22	–0.6837	27	–0.4051	18
Finland	–0.1162	14	–0.0208	13	0.0896	9	0.2193	7	0.3122	9	0.3528	7	0.4255	5
France	0.3048	6	0.3121	4	0.4654	3	0.4070	4	0.5517	2	0.5352	2	0.4773	4
Germany	–0.2593	16	–0.2322	16	–0.1985	17	–0.0962	15	0.1111	13	0.0920	14	0.0940	14
Greece	–0.6521	22	–0.6066	21	–0.5581	22	–0.4224	19	–0.3119	18	–0.2094	16	–0.3077	17
Hungary	–0.1606	15	–0.2180	15	–0.1465	16	–0.2387	17	–0.2708	17	–0.5866	23	–0.6613	28
Ireland	0.0085	9	–0.0167	12	–0.0594	13	0.1239	10	0.2004	11	0.2460	10	0.3747	9
Italy	–0.0122	11	0.0043	11	0.0822	10	0.0624	11	0.2053	10	0.1900	12	0.1688	12
Latvia	–1.0782	25	–1.0896	27	–1.1887	27	–1.0110	27	–0.8378	28	–0.6834	26	–0.4626	19
Lithuania	–1.2427	27	–1.4299	28	–1.3512	28	–1.1145	28	–0.7929	26	–0.5178	21	–0.5378	25
Luxembourg	1.1342	2	0.4347	3	0.7215	2	0.8248	2	1.1712	1	1.2694	1	1.3864	1
Malta	0.2364	7	0.7475	1	0.8406	1	0.8762	1	0.4603	5	0.3815	6	0.4205	7
Netherlands	0.3085	5	0.1463	7	0.1273	7	0.1938	8	0.4066	7	0.5097	3	0.5996	2
Poland	–0.9606	23	–0.9774	23	–0.8282	24	–0.7400	24	–0.7993	27	–0.6990	28	–0.4915	21
Portugal	–0.5129	19	–0.5630	20	–0.4780	20	–0.5795	21	–0.4428	20	–0.3718	19	–0.4758	20
Romania	–1.0737	24	–1.0797	26	–0.8371	25	–0.5427	20	–0.6684	25	–0.6414	25	–0.6580	27
Slovakia	–0.5680	21	–0.7298	22	–0.4081	19	–0.3621	18	–0.5108	21	–0.4898	20	–0.5219	24
Slovenia	–0.2689	17	0.2774	6	0.3471	5	0.5425	3	0.5444	3	0.4602	4	0.4930	3
Spain	–0.3615	18	–0.2696	18	–0.0932	14	0.0507	12	0.0284	15	–0.0615	15	–0.0268	15
Sweden	0.0632	8	0.0179	10	0.0927	8	0.1887	9	0.3698	8	0.2652	9	0.3287	10
United Kingdom	0.0079	10	–0.1782	14	–0.0105	12	0.0367	13	0.1120	12	0.1919	11	0.2619	11

Table 5 cont. Ranking of EU member states based on the value of the main factors of economic development of rural areas, 2000–2012

Country	2007		2008		2009		2010		2011		2012		2000–2012	
	synthetic index	rank	synthetic index	rank	synthetic index	rank	synthetic index	rank	synthetic index	rank	synthetic index	rank	synthetic index	rank
Austria	0.4070	12	0.4192	13	0.3916	10	0.4479	8	0.7137	6	0.6222	7	0.2717	10
Belgium	0.4983	7	0.5564	9	0.5879	7	0.0971	15	0.1421	16	0.1287	16	0.3619	8
Bulgaria	–0.7782	28	–0.6639	28	–0.6763	27	–0.7319	25	–0.7544	27	–0.7442	26	–0.4348	19
Croatia	–0.0093	16	–0.0597	18	–0.0078	16	–0.1689	19	–0.0452	18	–0.0717	18	–0.4629	21
Cyprus	–0.3591	19	0.7348	4	–0.2881	20	–0.3543	21	–0.3578	20	–0.4151	21	0.1534	15
Czech Republic	–0.5562	26	–0.4514	23	–0.6124	26	–0.6805	24	–0.6330	24	–0.6860	24	–0.5610	24
Denmark	0.6302	5	0.6549	7	0.5310	8	0.5797	7	0.6243	8	0.5393	8	0.4077	6
Estonia	–0.3754	22	–0.3419	21	–0.1149	18	–0.1036	17	0.1673	14	0.1813	13	–0.4456	20
Finland	0.6563	4	0.7122	6	0.6449	5	0.6152	6	0.7527	5	0.6561	6	0.4077	7
France	0.6182	6	0.7209	5	0.7403	4	0.7967	4	0.9893	3	0.9102	3	0.6022	4
Germany	0.4110	11	0.5960	8	0.6303	6	0.6312	5	0.6723	7	0.6617	5	0.2395	11
Greece	–0.3714	21	–0.2456	20	–0.3404	21	–0.3378	20	–0.3640	21	–0.4490	23	–0.3982	18
Hungary	–0.6163	27	–0.4581	24	–0.5634	25	–0.7983	28	–0.7189	26	–0.7751	27	–0.4779	22
Ireland	0.4966	8	0.3682	14	0.1698	13	0.3119	11	0.3752	10	0.2816	12	0.2216	13
Italy	0.3293	14	0.5165	10	0.4182	9	0.4254	9	0.3375	12	0.2968	11	0.2327	12
Latvia	–0.1083	17	–0.0347	17	–0.0296	17	–0.0054	16	0.1477	15	0.1356	15	–0.4805	23
Lithuania	–0.3600	20	–0.4323	22	–0.3810	22	–0.4336	23	–0.4364	23	–0.4376	22	–0.7283	28
Luxembourg	1.5333	1	1.6927	1	1.6576	1	1.3142	1	1.3988	1	1.2563	2	1.2150	1
Malta	0.4448	9	0.4857	11	0.2812	12	0.1709	13	0.0651	17	0.0209	17	0.4178	5
Netherlands	0.8089	2	1.0216	3	1.1226	2	1.2531	2	1.3278	2	1.2771	1	0.7002	2
Poland	–0.4047	23	–0.5341	26	–0.5054	23	–0.4252	22	–0.4042	22	–0.4142	20	–0.6295	25
Portugal	–0.3375	18	–0.0948	19	–0.1636	19	–0.1358	18	–0.2087	19	–0.2481	19	–0.3548	17
Romania	–0.5162	24	–0.5768	27	–0.5429	24	–0.7325	26	–0.6741	25	–0.7351	25	–0.7137	27
Slovakia	–0.5402	25	–0.4868	25	–0.7834	28	–0.7347	27	–1.0231	28	–1.0411	28	–0.6308	26
Slovenia	0.7652	3	1.0659	2	0.8323	3	1.0531	3	0.9509	4	0.9037	4	0.6128	3
Spain	0.1239	15	0.2656	16	0.0658	15	0.0992	14	0.2772	13	0.1801	14	0.0214	16
Sweden	0.4134	10	0.4819	12	0.3018	11	0.3581	10	0.4774	9	0.4435	9	0.2925	9
United Kingdom	0.3386	13	0.2838	15	0.1028	14	0.2432	12	0.3601	11	0.3277	10	0.1598	14

Source: Calculated by the authors.

CONCLUSIONS

The research results have proven the research hypothesis, stating that economic development of rural areas is higher in Western European countries than in those of Central and Eastern Europe. Thus, there is large diversification in economic development of rural areas among the EU Member States. In general, it is caused by wide range of not only economic and financial reasons, but also by historical, political and number of other prerequisites. Besides, economic development of any country is strongly dependant on the quality of the institutional framework and aspects such as: efficiency of legal provision, property rights, central and local authorities etc.

Because the indicators cover many distinct (and sometimes mutually controversial) levels of economic sustainability, it is possible, moreover, for countries to have similar "scores" for economic sustainable indicators but very different economic conditions in reality.

While there are common goals that are crucial to sustainable economic development of rural areas, there is no single approach that will guarantee sustainable success in every country. This heterogeneity has to be taken into account while developing multi-annual perspective programs, rural development policies and strategies for EU Member States in response to the requirements and specifics of their own rural areas.

In conclusion, indicators can be used to draw attention of policymakers to problem areas/spheres/regions. They also could be a set of management tools to measure progress over time.

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ROZWÓJ EKONOMICZNY OBSZARÓW WIEJSKICH W KRAJACH UNII EUROPEJSKIEJ W LATACH 2000–2012

Streszczenie. Celem pracy jest określenie rozwoju ekonomicznego obszarów wiejskich w krajach Unii Europejskiej w latach 2000–2014. W badaniach przy szacowaniu tego rozwoju wykorzystano wskaźnik syntetyczny, opracowany na podstawie zmiennych pierwotnych, takich jak: PKB per capita, plony zbóż, produkcja zwierzęca i wartość dodana w rolnictwie na 1 pracownika. Przy opracowywaniu wskaźnika syntetycznego wykorzystano analizę czynnikową. Badaniami objęto wszystkie kraje Unii Europejskiej. Z uzyskanych danych wynika, że najwyższy poziom rozwoju ekonomicznego obszarów wiejskich odnotowano w takich krajach, jak: Luksemburg, Holandia, Słowenia, Francja i Malta, a najniższy na Litwie, w Rumunii, Słowacji, Polsce i Czechach.

Słowa kluczowe: rozwój obszarów wiejskich, wskaźnik syntetyczny, kraje Unii Europejskiej

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BARRIERS TO THE INNOVATIVE ACTIVITY OF ENTERPRISES IN GREATER POLAND AND THE EXPECTED WAYS TO OVERCOME THEM

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Abstract. The article contains the results of research carried out in 2011–2012 among the three groups of respondents, i.e. industrial enterprises, science and business environment. The cognitive aim of the study is to present barriers and intensity ratings of their occurrence in the development of corporate innovativeness in Greater Poland and future plans for the growth of innovation. The functional objective is to develop a growth model of the innovativeness of enterprises. The results are interesting due to a variety of methods used, i.e. an interview method, a survey method, a comparative method, a statistical method and model method. The problem of the future behaviour of entrepreneurs regarding the growth in innovativeness is not recognized in literature. Moreover, the study of barriers to innovativeness requires a regional approach. Therefore, the subject of this paper and the ways of its implementation are innovative in terms of results. In the course of the process a lot of attention was paid to intangible barriers with regard to the resource business theory. An important achievement of the authors is determination of the expected role of innovation in building competitive advantages of companies.

Key words: innovativeness in business, barriers to innovative activity, building competitive advantages, innovativeness growth model

INTRODUCTION

According to the authors, the following reasons justify the chosen topic:

- first, the need for continuous improvement of the growth models of innovativeness for the practical operations of companies in economic and social spheres;
- second, companies play in this process an essential role in cooperation with the entities of science and business environment.

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The development of innovative companies can be considered in terms of the past, the present and the future. The inspiration for new look and analysis of the phenomenon of innovativeness was based in the early twentieth century on J.A. Schumpeter's determination of the concept of innovation [Schumpeter 1928] and his documentation that the stimulation of development required important institutional, social, cultural and political factors [Schumpeter 1939]. They are the causative agents of the economic growth of regions. In time, the category of innovation has widened, e.g. by including social innovation, especially regarding silver economy and crowdsourcing. Today, there is also a consensus that not all innovations fulfill their function of progress in the development, as some of them appear to be sham or bad (harmful to health and the environment).

In turn, future innovations constitute great hope for societies for the solution of environmental threats, as well as issues of social inequality – particularly the growth of occupational activation of the population and the quality of life. It is expected that in the management of change economic entities will take into account the paradigm of sustainable development [Strategy 2020], and new ideas, concepts and discoveries will be geared to meet the needs of society. Therefore, it is now necessary to strengthen the chances of such processes and reduce the difficulties arising along the way. What is more, "change is a continuous process without any exact destination" [Clarke 1997].

In the light of the current measures of innovativeness used in the rankings of the European Union and the OECD [IMD 2013, IUS 2014] and the global ranking [GII 2013], Poland represents quite a low position. Moreover, previous attempts to conduct changes for the better have not yielded any expected results. Numerous reports, surveys, monographs and other scientific works were developed in Poland. There, the authors undertook a variety of aspects to explain this adverse phenomenon. As a result, we know what needs to be done to change it for the better. But there are different views and answers to the question of how to achieve this. This is a difficult problem as at during the IX Congress of the PTE (November 2013) more than 30 papers were reported, which directly and indirectly related to innovativeness [Economics for the Future 2013]. This supports the view of W. Świtalski that "the processes of creation and diffusion of innovations are characterized by complex and not entirely known nature. The creation of something new and submitting this to the market test [...] requires a strong will, motivation and courage". [Świtalski 2005]. To join the trend of the discussion a study was performed in 2011–2012 and its results are presented below.

The cognitive goal of this article is to present the status and intensity of barriers to the development of innovative enterprises in Greater Poland and the expected ways to reduce them. The idea was to determine the type and severity of limitations and the future plans for coping with them in the opinion of respondents – representatives of companies, innovation experts. The functional objective is to develop a growth model of the innovativeness of enterprises.

METHODOLOGY

The study included three population groups: enterprises, universities and business entities. The group of companies concerns the manufacturing industry – Section C, and they are considered to be innovative on the basis of their participation in the PNT-02

study [Report on innovations... 2012] for the CSO in 2011. One thousand SMEs and large companies were drawn, taking into account the proportion of the volume of employment under different headings of Section C (Chapters 10–33). In 2011 they received survey forms on-line and at the same time via standard post, with the vast majority of closed questions [Marketing Research... 2012]. The survey included cognitive parts, which corresponded to the structure of the present article 259 correctly filled in questionnaires were returned. The structure of this sample was dominated by the SMEs (208). In contrast, companies that employ above 250 people amounted to 44, including 17 above 500 people, and 7 micro-enterprises.

The second community was composed of colleges. Direct interview was conducted in 2012 among 62 academic researchers selected on purpose, belonging to the group of innovators and working at faculties and research institutes in Greater Poland, having a close relationship with the innovations of various types – mostly technological. The criterions for selection of respondents were the grounds of merit and willingness to participate in the study. They represented the engineering sciences, medicine, and social sciences in the following proportions: 50, 22.6, 19.4 and 8%.

The third business community is formed by business environment divided into two groups. The first contains 17 units of financial support operating in Greater Poland, entitled and obliged to implement the function of the growth of innovativeness in the region. The study was conducted in autumn 2012. The structure of this group included 8 commercial banks, 3 non-governmental foundations, and 6 private companies. The second group consists of 11 units of technological infrastructure[1]. Their selection was purposeful and based on the principles of a desire for voluntary cooperation. The study was based on direct interviews conducted among the representatives of those organizations.

The characteristics of the research methodology can be seen in Figure 1. It should be noted that in the innovation ranking the region of Greater Poland ranks the 5th in Poland [Zalewski 2011] and the results obtained from such a large trial can be considered as representative not only for the region but also for possible generalizations regarding the entire country.

BARRIERS TO THE DEVELOPMENT OF INNOVATIVE ENTERPRISES IN GREATER POLAND

In the beginning, it is worth noting that the barriers to innovative activities of companies have been subjects of investigation by the CSO in the PNT-02 form. Factors mitigating the innovativeness of companies were divided there into economic, market (demand), related to knowledge (information) and others [Zalewski 2013].

There is, however, a lack of intangible barriers that in KBE play a strategic role in economic processes (social capital, intellectual property protection, human capital etc.). Opinions regarding these barriers to the development of innovation are very important [Obłój 2007]. Therefore, in the present study the division of the barriers included internal, external and separate ones regarding cooperation, but special attention was paid to the in-

[1]Centers to promote entrepreneurship, innovation incubators and economic foundations.

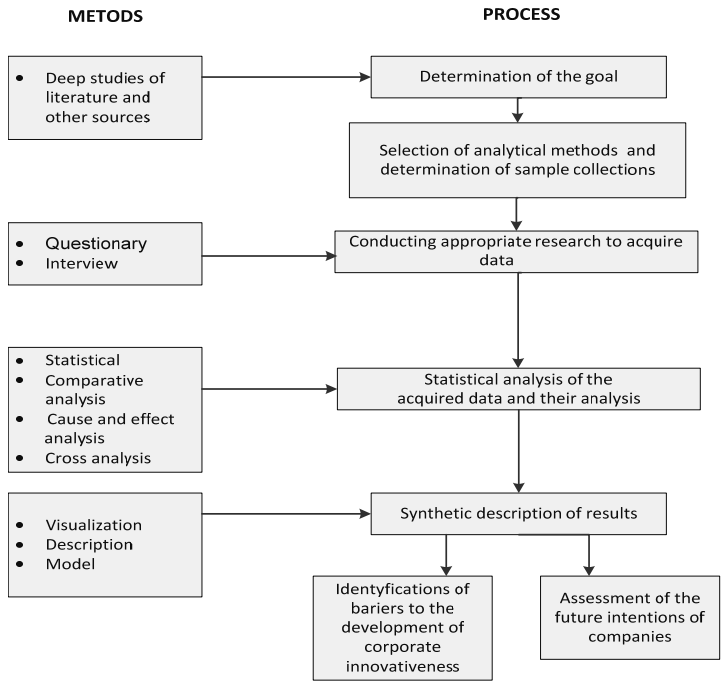

Fig. 1. Application of the test method in the experimental process in the implementation of the goal of this paper
Source: Own study.

tangible factors inherent in these barriers. The type of barrier was determined taking into account the order (the given rank) and the frequency of respondents' replies. The intensity was identified by the evaluation of statements listed in the questionnaire on a scale of 1 to 5, where: 1 means very high intensity, 2 – high, 3 – average, and 4 and 5 – low.

Turning to the analysis of the results of internal conditions, we find a large convergence of views of three groups of entities regarding the barriers to innovativeness. The analysis of the capacity to generate and commercialize innovations by those employed in the science sector points to high level of restrictions to social and human capital, but above all, restrictions to financial and formal institutions (Table 1). The structure of responses from the science sector employees indicates that 66% of them consider administrative and legal barriers as medium, and 25% as high. An even higher level of intensity of the internal barriers that exist in both human and social capital was indicated by the respondents of companies and technological infrastructure units in the business environment. It is difficult to miss that the material and financial barrier in the last two groups of entities was assessed as low and medium.

By analyzing a detailed structure of human (20 attributes) and social (13 attributes) capital, we find that the analyzed collectivities possess not only a low level of personal social capital, but they also lack any network of relationships, which does not create any added value of this capital. As a result, group social capital can sometimes be even lower than the personal one as a result of its destruction and the emergence of negative

Table 1. The intensity of the internal barriers of innovative activity of three groups of entities in the light of empirical research in Greater Poland

Entities	Barriers			
	equities			bureaucratic-administrative institutions
	material and financial	social	human	
Manufacturing industry enterprises	++	+++	+++	++
The sphere of science	–	+	++	–
Business environment				
– financial support	+	+	+	–
– parks, incubators, innovation centers		++	++	+

Intensity Rating: + + + high, + + medium, + low, – very high.
Source: Own study.

social capital (e.g. nepotism). This translates into a small innovative individual and collective capital understood as the innovative potential to create[2] the realm of new ideas by employees and their further implementation. The concepts of knowledge emergence are based on the existing networks of creative people. Despite the impact of globalization on the forms of communication between people of distant countries, close contacts within small communities and between them remain very important. They are based on trust and knowledge sharing within networks, which then become more innovative. The literature explains the importance of relational closeness for cooperation in networks [Czakon 2010]. In the construction of innovation networks, geographical proximity is more important for the biotechnology industry, and less for the automotive industry. Today, the emergence of the local innovativeness system, therefore, also affects the structure of the industry, as well as the institutional and organizational, cognitive and social proximity of entities. Then "social capital stimulates innovations, education and self-education, as well as labor productivity growth and is as important as both physical capital and human capital" [Putnam 2007]. Thus, one cannot contest research achievements, which show that it is primarily social capital that shapes the creativity and subsequently its transformation into innovation through commercialization. The transmission of knowledge is conditioned by the level and structure of social capital, leading to a climate of innovation through its impact on supply and demand for innovations and cooperence[3]. But those attributes of social capital are important that promote common time spending and building teamwork by ties of varying degrees of formality. It turns out, that this affects the choice of methods of diffusion and absorption efficiency of new technologies. The analysis of some dimensions of social capital as reflected in the reports of the IMD and the referred studies can ascertain that in the Polish conditions they constitute a significant barrier to innovativeness and are contained mainly in the group of structural attributes (reliability, loyalty, cooperation in a group) and the cognitive ones (trust, openness, ethics,

[2]Innovation capital is understood as intellectual capital and creative powers.
[3]Cooperence is the type of relationship between competitors which takes into account cooperation in creating value and competing for its division to achieve common benefits [Skawińska, Zalewski 2008].

acceptance of others), and to a lesser extent – behavioural ones (activity, communication) [Skawińska 2011].

Interestingly, the representatives of the technology transfer units also pointed to internal intangible barriers. They are the following resources and attributes of human and social capital:

- distrust for the cooperative activities and to organize joint business ventures;
- distrust between the representatives of science and business;
- insufficient level of pro-innovation attitudes and behaviour among entrepreneurs;
- small number of technological implementations by research institutes and research units;
- insufficient level of pro-innovative attitudes and behaviour among representatives of science and R&D sector;
- too low level of individual social capital of employees;
- lack of specialists who could perform a professional market analysis of inventions;
- lack of specialists to evaluate the market value of innovations.

We note, however, that particularly in the implementation stage of innovation, the activity of all three spheres of entities in cooperation is important, i.e. science, business and the business environment. Of all the innovative companies, 20% (as indicated by the study) partnered with scientific units. This demonstrates that among the remaining companies there were no contacts and business relationships between those entities. This is confirmed by national studies which indicate that in 2011–2012 cooperation with the science sector was undertaken by 2% of SMEs [Operational Programme... 2013]. An analysis of the conditions in this phase of innovation activities (in the opinion of the representatives of the three spheres) points to their large internal constraints on human capital and social capital, and the risk of promotional and organizational character (Table 2). The basis for the latter were the answers to the following questions: Do you know how to reach scientists/scientific institutions interested in implementing innovations?, If you have not cooperated with the sphere of science, why is that (9 statements to choose from)?

State capital and diversity of innovativeness in the field of scientific units justifies the request for an increased funding for research in this sphere of organization and concentration of innovative activity. In turn, among organizations that provide financial support

Table 2. The intensity of the barriers preventing the cooperation of the three groups of stakeholders in the implementation of innovation in the opinion of the respondents from the region of Greater Poland

Entities	Barriers				
	market	promotional and organizational	financial reinforcement	capital	
				human	social
Manufacturing industry enterprises	+	++	+	++	++
The sphere of science	+	+	++	++	++
Business environment	+	+	+	++	++
– financial support	++	+	++	+	+
– parks, incubators, innovation centers					

Symbols and source as in Table 1.

there is an urgent need to disseminate knowledge about innovations. Increased awareness and knowledge on the subject of the management of these units will facilitate the formation of trust in building relationships and cross-organizational collaboration. The main barrier here is the quality of human resources and social capital of the employed. What is needed is a greater awareness of the active involvement of banks in the risk assessment of ongoing applications to fund innovative projects.

Although the barriers to the development of the cooperation between industrial companies and the national sphere of science, regarding innovativeness, are quite complex (in the opinion of respondents), they are mainly related to the lack of knowledge, information and offers about such possibilities on the part of scientific units and R&D, even though there are already multiple open innovation platforms. This indicates the weakness of cooperation between the two spheres and the phenomenon that both economic and scientific entities deal with their own businesses without the need to "attract one another". The argument for doing so is located in the high price and the bureaucracy of billing the services of the science sector.

Verifying the subjective opinions of respondents on barriers to collaboration, it can be seen that they are situated on the side of non-capital assets. To a large extent, they arise from the lack of involvement and networking skills and the use of existing information and the difficulty in accepting new things. There is also a lack of understanding of the benefits of cooperation, because the majority of companies rely on the use of traditional sources of competitive advantage. An opportunity to improve cooperation lies in the reduction of these limitations through an increase in expenditures for science and their control, improved motivation and the sphere of regulation.

The innovative activity of entities is also determined externally. Again, the conditions for innovative activity occurring on the side of the market, regional and national policies are perceived by actors with varying intensity. It is higher regarding science and manufacturing, and lower in the business environment. The main barriers are listed in Table 3.

Table 3. The intensity of the internal barriers to innovative activity of the three groups of entities in the light of empirical research in Greater Poland

Entities	Barriers		
	market	formal institutions	innovation policy of the state and region
Manufacturing industry enterprises	++	+++	++
The sphere of science	+	+++	+++
Business environment	++	+	+
– financial support	++	+	+
– parks, incubators, innovation centers			

Symbols and source as in Table 1.

These barriers are of the following character:

- market (low economic power of a company, limited ability to partial self-financing, low demand for innovation), small supply of funds for innovation);
- formal institutions (legal, administrative, procedural);
- policy of the state and regional authorities (small support for the authorities of the region, little inspiring innovation policy).

FUTURE PLANS IN THE ACTIVITIES OF COMPANIES TO INCREASE INNOVATIVENESS

The studies also had to answer the question of whether businesses need to build competitive advantage through innovation, in the belief that "companies achieve sustainable competitive advantage through innovative activities and gaining technological leadership" [Porter 2001]. The question was: Which markets in your view will create the greatest opportunities for growth of innovativeness in the next 5 five years in Poland? It turns out that according to the respondents, within the next 5 years opportunities to boost innovativeness in companies will be seen in the development of technology and organic products and energy-efficient markets. It seems that the evaluations of respondents expressed willingness to choose the future of innovative activities of enterprises to areas of support by the EU funds (ICT electronics, sustainable energy, fuel etc.). Thus, the issues of innovation taking into account demographic processes and also social services, health, education markets and new global trends in the development of smart markets are not fully appreciated.

In the future, competitive advantage of innovative activities, as envisaged by the respondents, will be based on the sources of quality, cost and collaboration with customers. In the light of KBE challenges these measures are conservative and traditional. In contrast, new sources, such as changing the structure of the organization (alliances, clusters, new business models, new marketing instruments, cooperation with a competitor) attract little attention, although they are noticed.

This conclusion corresponds with respondents' perception of the validity of prospective measures to enhance innovativeness. Of the eight possible actions listed in the questionnaire, some replies indicated the need to improve quality, customer service and reduce costs. Moreover, the same indications regarded the activities already undertaken in recent years to strengthen the innovativeness of companies. In addition, although with less intensity, the indications pointed to the monitoring of the sources of innovations, cooperation with foreign companies, knowledge management, information and better employee motivation to submit innovative proposals. The following activities did not gain any significant recognition: the analysis of innovation market risk, functional flexibility of employees, etc.

Future actions foreseen by the representatives of the companies probably are a step forward in the light of the gap of innovativeness in Poland, but it is not sufficient. There is small emphasis on cooperation within the framework of the triple helix, prosumption and structural and organizational changes.

A hope for pushing the development of innovations at the micro-level (companies) is in the statements of the respondents (about 70%) from the industrial sector to initiate or continue their innovative activity. This is supposed to facilitate reaching talented workers within the framework of the improvement of human capital management. Among the ways to reduce the barriers to innovative activity, the following ones are listed here: cooperation with competitors, with the realm of science, banks and IT sector. It should also be noted, that among the used instruments of human capital management, to enhance innovative activity of enterprises, the main role is played by the support of the process of education of employees, the improvement of the system of their integration and motiva-

tion and internal communications. This may increase the level of corporate social capital (trust, norms and values, entrepreneurship), which affects the development of informal relationships between employees and in a network of organizations, and shapes an increase in innovativeness.

ENTERPRISE INNOVATIVENESS GROWTH MODEL

On the basis of the findings it can be concluded that the innovative potential in enterprises is composed of both human capital and social capital. The quality of results stems from the state policy in the field of both formal and informal institutions, as well as the used instruments of fiscal and monetary policy. It has remained hidden until recently. It becomes relevant to monitor the sources of innovative capabilities within individual entities and through cross-organizational collaboration. However, there arises a question of its sufficiency to overcome the mentioned innovation gap, in relation to the leading countries. It is necessary to adopt strategies for a strong growth of this potential in the innovative policy of the state. This view is reflected in the simplified spiral model in Figure 2. It includes the impact of institutions in behavioural terms (both formal and informal) on innovations and an increase in corporate innovativeness.

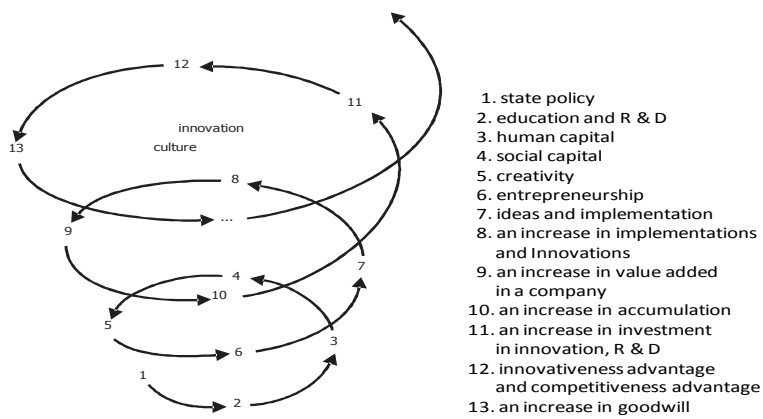

Fig. 2. Company innovativeness growth model
Source: Own study.

In the interpretation of the assumptions for the proposed corporate innovativeness growth model it is noteworthy, that innovation policy is shaped by the Polish National Innovation System (NIS), although it, in turn, is part of the created European Innovation System (EIS). Thus, considering these dependencies and the fact that innovation policy is understood as instruments and means of regulating the market of innovation and activation tools for innovative activity of companies, it has been positioned inside the model in the first place. The further chain of causal impulses is as follows. NIS affects regional innovation policy and together they impact the growth potential of innovative enterprises (points 2–7 in Figure 2). This, in turn, causes the growth of innovations as a source of competitive advantage, which results in an increase in the financial strength of companies

and self-financing of innovative activities and an increase in its value. An innovative culture is created and the competitiveness of businesses grows (points 8–13 in Figure 2). In the long term a regional innovative environment is formed.

CONCLUSIONS

The directions for improvement of the growth of innovativeness in Poland stem from numerous research projects conducted by different authors, e.g. Poland… [2013], Raport… [2011], Impact… [2012], Hausner [2012]. The mentioned results that refer to the three groups of subjects are consistent with the achievements of those authors. For example, they refer to the barriers to innovative activity. In the sphere of science these are very favourable conditions for the conceptualization of innovations as a result of excessive bureaucracy, the lack of effective protection of intellectual property, inadequate funding of basic research and development and a negative selection of personnel. The ratings of companies also reflect a visible material-financial barrier and an unfavourable structure of investment in innovations. In addition, the modern understanding of the sources of creation, diffusion, implementation and absorption of innovations requires cooperation between entities. In turn, such cooperation is possible, if facilitated by the quality of human capital and social capital [Skawińska 2011]. Meanwhile, the results of the study indicate that these intangible factors form barriers to companies, universities and business environment units. Therefore, they do not enforce their cooperation. Therefore, the role of external entities (suppliers, customers, universities) in creating innovations is small. In this context it is worth recalling the thought of Ewa Okoń-Horodyńska, who stresses that "innovations [...] are the first and far-reaching social collective effort, a cooperative process [...], which always requires a long-term perspective" [Okoń-Horodyńska 2013].

In addition to confirming the earlier results of other authors, these studies also make a contribution to the literature with the recognition of the importance of innovation in shaping competitive advantage of companies in the next five years. Their results are not entirely favourable in relation to the intangible factors. Therefore, in order to reduce the identified barriers, it has been proposed to implement the proposed spiral model of innovativeness growth, which has identified the importance of innovation policy of the state as the causative entity.

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OGRANICZENIA AKTYWNOŚCI INNOWACYJNEJ PRZEDSIĘBIORSTW W WIELKOPOLSCE I PRZEWIDYWANE SPOSOBY ICH POKONYWANIA

Streszczenie. Artykuł zawiera wyniki badań wykonanych w latach 2011–2012 wśród trzech grup respondentów, tj. przedsiębiorstw przemysłowych, nauki i otoczenia biznesu. Celem poznawczym pracy jest przedstawienie barier i ocen intensywności ich występowania w rozwoju innowacyjności firm w Wielkopolsce oraz przyszłych zamierzeń dla wzrostu innowacji. Celem aplikacyjnym jest opracowanie modelu wzrostu innowacyjności przedsiębiorstw. Wyniki są interesujące dzięki zastosowaniu wielu metod realizacji celu, tj. metod: wywiadu, ankietowej, porównawczej, statystycznej i modelowej. Problem przyszłych zachowań przedsiębiorców w zakresie wzrostu innowacyjności nie jest w literaturze rozpoznany. Co więcej, badanie barier innowacyjności również wymaga podejścia regionalnego i dlatego temat pracy oraz sposoby jego wykonania należą do nowatorskich w aspekcie wyników. W przebiegu badanego procesu zwrócono szczególną uwagę na bariery o charakterze niematerialnym z uwzględnieniem zasobowego nurtu teorii przedsiębiorstw. Ważnym osiągnięciem autorów jest określenie przewidywanej roli innowacji w budowie przewag konkurencyjnych firm.

Słowa kluczowe: innowacyjność przetwórstwa przemysłowego, bariery aktywności innowacyjnej, budowa przewag konkurencyjnych, model wzrostu innowacyjności

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VARIABILITY AND CORRELATION OF THE WHOLESALE AND RETAIL PRICES OF APPLES ON THE WARSAW MARKET IN THE YEARS 2003–2013

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Abstract. Variability of apple prices on Warsaw market at three levels of the market chain – the producer price of industrial apples and the producer and retail prices of the dessert apples were investigated. In order to assess their mutual connections a comparative vertical and horizontal analysis of changes on the above mentioned markets was performed. The direction and dynamics of price changes were analysed as well as a year to year level of price variability and seasonal variations. What is more, their relations and the power of connection between them as well as the price effect on the shaping of export level were determined. The performed investigations will allow an assessment of the present situation of producers and point out the trends of action in order to keep the position of Poland as an important apple producer.

Key words: producer prices, retail prices, price variability, industrial apples, dessert apples

INTRODUCTION

The complexity of the agricultural and food market as well as the presence of many channels of distribution cause the fact that more and more often the notion of price in that business is substituted by the "price system" notion. It includes the prices of purchase of the agricultural produce, prices of the wholesale sale, means of production in that sector and the retail prices of those products [Wysokiński, Jarzębowski 2013]. Prices play an important role in the national economy being the basic factors affecting the producer economical decisions and the consumer decisions concerning the allocation of his income. Generally that role is filled by its informative function by transmitting signals about the supply and demand situation. Prices obtained by producers of agricultural products,

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including horticultural products, are conditioned by the supply and demand relation existing at the outlet while prices paid by consumers are shaped by the supply and demand relation at the level of the retail sale. Price relations on the wholesale and retail market mainly differ due to the fact that producers and consumers are removed from each other by various stages of the system of sale organization [Świetlik 2008]. A highly complicated chain of sales on the fruit market which includes the participation of wholesalers, distributors, manufacturers and commercial enterprises unfavourably affect the flow of stimuli shaping the final price which the consumer has to pay [Vavra, Goodwin 2005]. A significant differentiation of prices at particular levels of distribution of agricultural products may testify to the lack of integration of the above mentioned markets [Serra et al. 2006]. As a result of those occurrences prices do not fulfill their basic function informing about the supply and demand situation using the model of the perfectly competitive market. The transfer of price signals through particular selling levels called the price transmission becomes disturbed. What is more, it may leads to the more and more often observed asymmetry in price transmission which lies in a different price reaction on a certain market to the price increase or price decrease on another market. As a result of that process subjects at the beginning and end of the commercial chain do not get full information which makes it hard to adapt to the situation on the market [Bakucs et al. 2012]. It is important that prices on the fruit and vegetable markets are determined by many factors which both the power and direction of action practically cannot be predicted [Szajner 2013]. Very often there are observed numerous variations, mainly seasonal, of their levels and they are the highest among prices of all the agri-food products [McLaughlin 2004]. The lack of stability in the agri-food products supply is connected with a high price risk which is particularly important for the producers because the time of selling products significantly affects the profitability of production [Just, Śmiglak-Krajewska 2013]. A high price variability in the agri-food sector of production restricts the possibility of their forecasting for the future, thus preventing them from making decisions concerning the direction of production and gaining profits [Apergis, Rezitis 2003]. It is an additional stimulus for a systematic and multidirectional price testing. It is especially vital on the apple market, a most important Polish horticultural product of which our country is the biggest producer in Europe [Wróblewska 2012], and also an important exporter with its share in the international volume of the trade turnover amounting to about 3% [Nosecka et al. 2012]. In the recent years the share of apple harvests comprised 80% of all fruits in the country, amounting to 19–25% of the total harvests of these fruits in the European Union [Makosz 2011]. Analysing the price effect on the Polish apple market will allow to assess the situation of producers on that market thus being an indicator for further activities aiming at limiting the price risk and increasing profitability of farms.

MATERIAL AND METHODS

The study presents analysis of the direction and dynamics of apple price changes at the level of the producer, both retail and processing plant and their interdependence on the Warsaw market in the years 2003–2013. Price analysis was preceded by the characterizing of changes of the production area, the volume of harvest and apple consumption

in Poland. The dynamics of changes of particular types of prices and other phenomena was determined with the help of a slope of the trend lines (b), determined for the production years for the absolute and relative values. Descriptive statistics of the time series was presented using the mean price for the analysed period, median, maximum value, minimum value and the coefficient of variation. In order to present the relation between the producer prices and the retail prices the margin level was determined and the share of a wholesale apple prices in the retail price was presented. In order to show the relation between the dessert apple prices at the selling level and retail level the analysis also included the seasonal variations in both links of marketing chain which were presented in two subperiods in order to check how the development of the storage bases affected the seasonal prices of those fruits. In the analysis of a seasonal character the seasonal index was used expressed in per cent of the mean annual price accepted as 100%. This study is the first step in a broader analysis of fruit and vegetable prices different of markets levels, in which the prices transmission analysis will be attempted.

The data obtained in the empirical studies of the Warsaw market were used as a source material. The analysed industrial prices are those which the producer get for apples sold for processing, the wholesale prices concerned the apple prices obtained by producers on the Warsaw Agri-Food Wholesale Market in Bronisze, which should be called the producer prices while the the retail prices were taken from the registration at three types of the retail selling places – two markets, two greengrocer's shops and the supermarket in Warsaw. The registration of prices at each trade turnover stage was performed every week in the years 2003–2013.

RESULTS

Changes in production and consumption of apples in Poland

In the analysed decade the area of apple orchards in Poland was characterized by a growing tendency. In 2013 apple production was carried out on the area of 195 thousand ha, i.e. 22% bigger than in 2003 (Fig. 1). Similar dynamics was characteristic for apple harvests which in 2003 amounted to 2.45 million t and in the analysed decade increased by 20% and in 2013 reached the level of 2.88 million t. The situation is reversed as in the most European countries where the decrease of the cultivation of apple trees as well as apple harvests is observed [Makosz 2010, Jahae 2011]. It is worth noticing that in the case of apple harvest a significant fluctuation of their levels was noted which resulted from the adverse weather condition which significantly decreased crops. It is particularly noticeable in 2007 where crops were smaller by 57% than in the previous year due to the spring frosts. According to Nosecka [2008], they were the lowest for the last 20 years. Similar situation was observed in 2010 when apple crops in Poland were lower by 23% than in 2009. That drop was caused by the low temperatures at the time of tree blooming and directly after it and also in autumn as well as significant floods.

A completely different is the situation in apple consumption by the Polish consumers which despite the production growth has gradually decreased since 2003. In 2003 one resident of our country on the average consumed 23.76 kg apples a year and in 2013 only

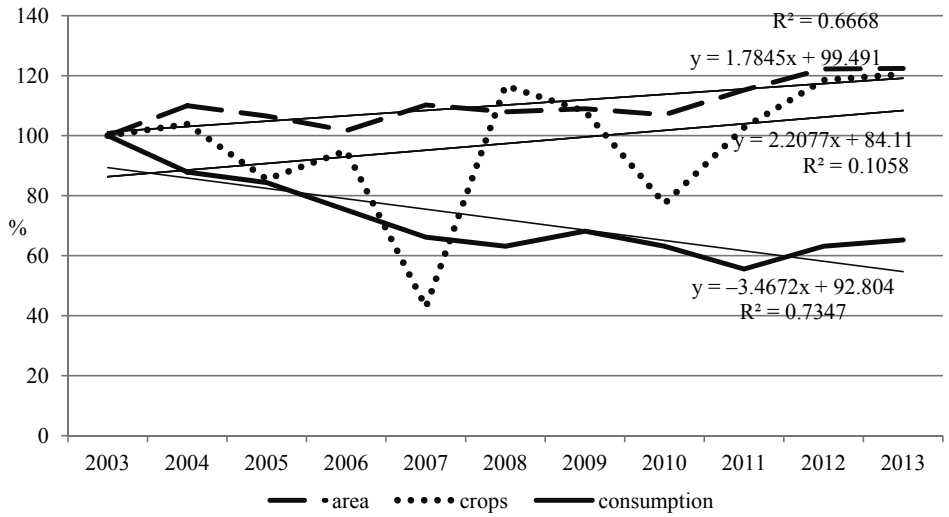

Fig. 1. Changes of the production area, crops and consumption of apples in Poland in the years 2003–2013 (2003 = 100%)
Source: Own elaboration on the basis of the GUS and IERiGŻ-PIB.

15.5 kg. Thus the consumption of those fruits decreased by 35%. From the point of view of a producer it is an unfavourable fact which means the decreasing demand for those fruits. The causes of such a situation could be found in the increased accessibility of other fruits, mainly because of the increasing import. In such a case the condition of development or even holding on to the production at the present level is the development of its sale on the foreign markets.

Changes of apple prices in a long term

The performed analysis of changes of the mean annual apple prices in the production year 2003/2004 to the production year 2012/2013 showed that prices of all three types were characterized by their growing tendency. However, there were differences in the dynamics level of their growth. In the case of dessert apples the producer prices grew a little quicker than the retail prices. The producer price increase amounted to 3.46% in relation the many year average but it was only 0.06 PLN per 1 kg a year more. The mean apple price in the analysed period received by the producer on the wholesale market was 1.74 PLN per 1 kg and the maximum price for a kilogram of apples obtained on the wholesale market was 2.59 PLN in 2007/2008 and minimum price was 1.28 PLN in 2009/2010. However, the yearly average of the retail prices grew by 3.34% as compared to the many year average which in the absolute values amounted to 0.11 PLN per 1 kg. The average apple price at that period in the retail sale amounted to 3.38 PLN per 1 kg (Table 1). In the relative values the biggest changes were observed in the industrial apples, which on the average increased even 4.91% in relation to the many year average but in the absolute values it was a yearly growth of only 0.02 PLN per 1 kg. The average which producers received for apples sold with the help of the market chain was only 0.39 PLN, however,

Table 1. Descriptive statistics of the time series of apple prices (2003–2013)

Specification	Directional index of the tendency line (b)[a]		Standard deviation	Average	Median	Maximum value	Minimum value	Coefficient of variation	Directional index of the tendency line (b)[b]
	PLN·kg^{-1}	%	%	PLN·kg^{-1}	PLN·kg^{-1}	PLN·kg^{-1}	PLN·kg^{-1}	%	%
Dessert apples									
Producer price	0.06	3.46	26.42	1.74	1.75	2.27	1.28	20.64	3.09
Retail price	0.11	3.34	20.03	3.38	3.23	4.21	2.68	15.97	3.12
Industrial apples									
Buying price	0.02	4.91	43.47	0.39	0.37	0.60	0.16	38.20	5.79

a – for production years, b – for calendar years.
Source: Own investigations.

the difference between the highest (2007/2008) and the lowest (2009/2010) price was the biggest, here because it amounted to even 3.7 fold.

The situation is different when price changes are presented for calendar years in which the average year apple price results from the shaping of fruit prices from two harvests. In that case the growth of retail prices is quicker. Thus depending on the formula of the average price various conclusions can be drawn. However, due to the production cycle ending at the moment of selling the entire production it is more correct to use the production years.

The presented differences between the maximum and minimum price reveal a significant differentiation of apple prices between particular years of the analysed period which is confirmed by the coefficient of variation. It results from a great variation of crops which is presented in Figure 1. A very low crops in 2007 and 2010 contributed to a significant increase of prices in the production years 2007/2008 and 2010/2011, respectively. Assuming that an average price for the investigated many year period is 100%, then prices of the dessert apples, both producer and retail prices, and industrial apples amounted to 152, 138 and 164% in the production year 2007/2008 and to 80, 91 and 47% in the following year 2008/2009 (Fig. 4). Similar situation was observed in t 2010/2011 when the prices amounted to 133, 129 and 156%, while in 2011/2012 – 105, 106 and 140%. It should be noticed that the highest variability resulting from the crop fluctuation is characteristic for industrial apples. In the case of dessert apples their prices show smaller variability and as it is revealed by the value of standard deviation and variability coefficient, variability of the wholesale prices is greater than retail prices. That diversity of the degree of variability means that the changes of prices at the producer level are not fully reflected in the retail prices.

As it has already been mentioned the falling tendency of apple consumption forces the producers to look abroad for markets. It is particularly evident in the years of high crops and resulting price drop on the wholesale markets. Figure 2 shows that in the year of the lowest prices the volume of export grows. The Pearson coefficient for those values and the dependence of price on the crop takes the negative values at the level of –0.70.

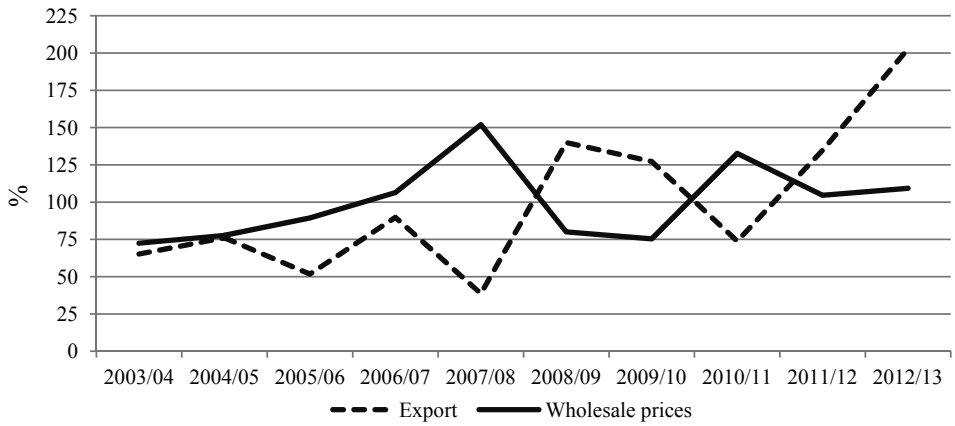

Fig. 2. Changes in the export level and wholesale prices in Poland in production years from 2003/2004 to 2012/2013 (many year average = 100%)
Source: Own investigations.

Relation of apple prices on the Warsaw market

Comparative analysis of prices obtained by producers for dessert apples on the wholesale market and retail prices showed clear fluctuations of the share of producer prices in consumer price. That share to a large degree is connected with the level of fruit supply in a given production year. In the years 2004–2007 the crop dropping tendency was accompanied by the growth of the share of producer price in retail price. After a very low crops in 2007 that share amounted to 56% in the production year 2007/2008 (Fig. 3). In turn, high crops in 2008 and 2009 caused a relatively drop of producer prices in relation to consumer prices in the production years 2008/2009 and 2009/2010. The producer obtained only 45.07 and 44.03% of the retail price, relatively. The fall of crops in 2010 resulted in another increase of the share of producer price in consumer price which in the production year 2010/2011 amounted to 53%. The last two years again show a decrease of that share caused by the increase of crops, however, it was not a significant drop because only to 51 and 52%. Thus, generally, with lower crops the share of producer price in retail price increased while with higher crops decreases.

Considering a high correlation between producer prices and retail prices and at the same time their variable relation a conclusion can be drawn that an elastic system of price margins functions on the retail market. It is confirmed by the analysis of changes of both types of prices and margins in the subsequent years. It shows a clear connection between the margin level and price level on the wholesale market. When the producer prices grow the margin increase is smaller causing a relatively lower drop of retail price. For example, in the production year 2007/2008, a year of a small crop, the wholesale price grew by 52% and retail price by 39% (Fig. 4). That year the margin level was higher only by 22% thus constituting 78% of producer price. On the other hand, in the production year 2003/2004 with the wholesale price lower by 30% as compared to the many year average, the margin was lower only by 20%, thus causing the drop of retail price by 25% as compared to the average. Thus the retailers making the most of high supply and the

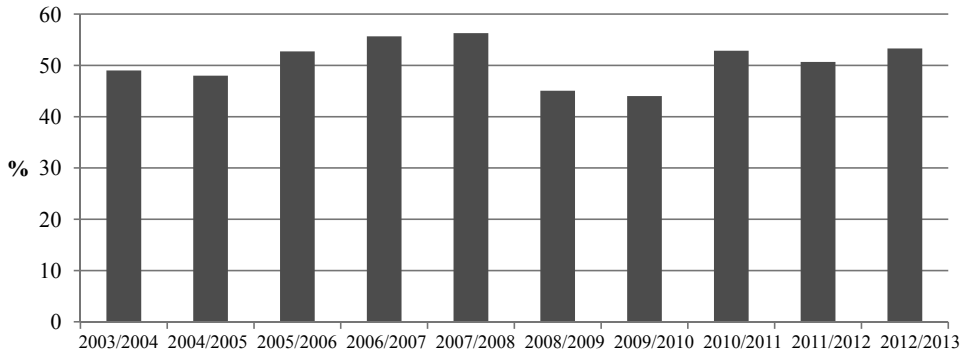

Fig. 3. The share of producer price in retail price on the Warsaw market in the years 2003–2013
Source: Own investigations.

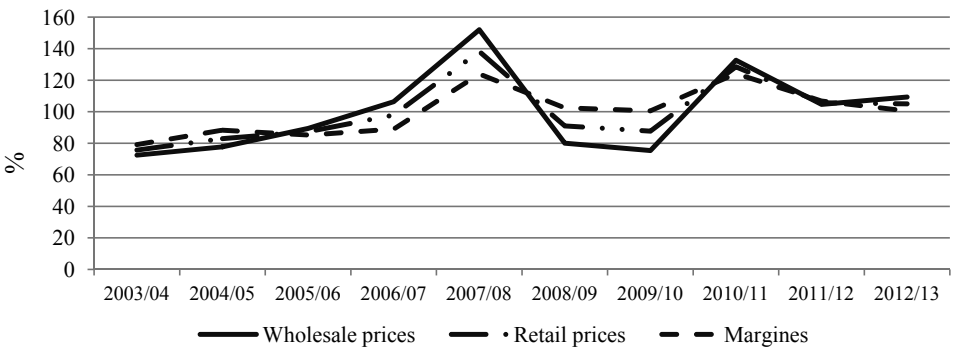

Fig. 4. Fluctuations of wholesale prices, retail prices and margins on the Warsaw apple market in the years 2003–2013 (many year average = 100%)
Source: Own investigations.

increase of competition, pat the producers lower prices and using higher margins compensate themselves the profits lost in the years of a low supply and high producer prices. That leads to a greater price stability on the retail market. However, at the same time the consumer does not get full information about supply and in the situation of its high level gets smaller profits from it. With the proportional transfer of the producer price fall on the retail price the demand for apples could increase. In reality that demand in Poland is not flexible, the market for apples became saturated and consumption stays at the same level for a number of years. Thus the aim of the retailers is maintaining that stable level and at the same time limiting their own risk.

Seasonal nature of apple prices

In the years 2003–2013 apple prices showed bigger or smaller seasonal fluctuations, depending on the crop volume. Generally these prices were at their highest in July, i.e. at the time when apples from the last year harvest are in a small quantities and the harvest has not yet begun. From August, when the summer cultivars start to bear fruits, there is

a gradual price fall and that tendency is observed until December. From January apple prices start to grow. The performed analyses show that the producer prices are characterized by slightly higher seasonal nature than retail prices. In the production years from 2003/2004 to 2007/2008 the lowest seasonal indicator of the producer prices was 81% and the highest 135% while the indicator of retail prices 88 and 124% (Table 2). In the years 2008/2009 – 2012/2013 these indicators in the case of producer prices stayed at the level of 79 and 162% and in the case of retail prices – 87 and 146%. These values also show that no decrease in the seasonal nature of apple prices was observed although the cold storage base significantly increased [Makosz 2010] as well as the scale of the shared sale by producer groups and organisations [Sobczak et al. 2013]. However, it should be stressed that those two changes contributed to the relative price fall in June which is advantageous for a consumer. An intensive price growth in the second subperiod resulted from a logical action of producers and not storing apples until July when they lose the competition with a big assortment of seasonal fruits.

Table 2. Indicators of seasonal nature of dessert apple prices in the production years from 2003/2004 to 2012/2013 (%)

Price	Months											
	VII	VIII	IX	X	XI	XII	I	II	III	IV	V	VI
	2003/2004 – 2007/2008											
Producer	130	118	81	85	87	81	84	86	92	103	126	135
Retail	119	118	95	89	92	87	88	89	90	99	115	124
	2008/2009 – 2012/2013											
Producer	162	120	87	84	85	79	81	90	88	103	126	126
Retail	146	112	91	92	87	87	87	90	88	96	111	123

Source: Own investigations.

CONCLUSIONS

The performed investigations showed that the dessert apple prices on the Warsaw market showed a growing tendency in the years 2003–2013. However, it differed at particular levels, namely the dynamics of the wholesale price increase was slightly higher than in the case of retail prices. A poor increase of retail prices with their simultaneously smaller variability in particular years and lesser seasonal fluctuation show that the price changes at the producer level are not fully transferred to the retail market. It may indicate to the disturbances in the price transmission on those markets. They result from the activities of the retailers stabilizing the consumer market by establishing higher margins with the lower level of producer prices and lower with higher prices. Despite the existing divergences in the price information flow still there is a stong connection between prices at both stages of appe distribution. There is also a strong connection between producer prices of dessert and industrial apples but only in relation to the annual prices and those latter increased more intensively in the calendar years although at the lowest absolute level. Prices of the industrial apples also show the greatest variability from year to year. Low industrial fruit prices and their great variability make the producers to introduce into their orchards the newest production technology which will increase fruit quality quali-

fying them as the dessert apples for direct consumption thus limiting the amount of the industrial fruit. Despite introducing these solutions in many cases it will be impossible if only due to the occurrence of the adverse atmospheric conditions such as hailstorms, which would decreases the quality of the produced apples. A slight increase of dessert apple producer prices and the simultaneous decrease of their consumption make the gardeners to undertake actions aiming at the expansion to new markets and the increase of export. Its level increases in the years of high supply and low prices on the home market.

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ZMIENNOŚĆ I WSPÓŁZALEŻNOŚĆ HURTOWYCH I DETALICZNYCH CEN JABŁEK NA RYNKU WARSZAWSKIM W LATACH 2003–2013

Streszczenie. W pracy badano zmiany i współzależność cen jabłek na rynku warszawskim na trzech poziomach łańcucha marketingowego – cen producenta jabłek przemysłowych, cen producenta i cen detalicznych jabłek deserowych. Aby ocenić ich wzajemne powiązania, dokonano pionowej i poziomej analizy porównawczej zmian w cenach jabłek na wspomnianych rynkach. Analizowano kierunek i dynamikę ich zmian, poziom ich zmienności z roku na rok, wahania sezonowe. Określono również siłę związku między nimi, a także wpływ poziomu cen na kształtowanie się poziomu eksportu na poszczególnych powyższych etapach dystrybucji. Przeprowadzone badania pozwolą na ocenę obecnej sytuacji i wskazanie kierunku działań dla utrzymania pozycji Polski jako liczącego się producenta jabłek.

Słowa kluczowe: ceny producenta, ceny detaliczne, zmienność cen, jabłka przemysłowe, jabłka deserowe

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PRICES OF PAINTINGS ON POLISH ART MARKET IN YEARS 2007–2010 – HEDONIC PRICE INDEX APPLICATION

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Abstract. Art market in post-communist Poland has been developing for 25 years now although it has been still small with total turnover in 2012 estimated as 0.2% of the world sales of artworks. Therefore the aim of the research is to describe the present state of the art market in Poland and to evaluate prices of paintings produced by 11 Polish artists whose artworks were traded the most often in years 2007–2010. In the research, employing data concerning 750 objects sold on auctions that held in Poland, hedonic index methodology is applied to estimate changes of prices at the paintings market. The results of authors' investigation show that the hedonic quality adjustment essentially influences evaluation of artworks' prices.

Key words: art market, hedonic price index, investment

INTRODUCTION

The art market in Poland is quite small since it has been developing during last two decades when essential changes in the income distribution and the increasing interest on art market in the Polish society have been observed. Therefore here the question arises if purchase of artworks created by Polish artists can be treated as an investment that gives decent return.

Investment in artworks has been considered as an alternative investment opportunity for investors for approximately forty years[1]. Renneboog and Spaenjers [2013] on the basis on more than a million auction trades, that took place in the period 1900–2007, for 10,100 artists show that return for art is only 4% per year while stocks yield a return over 6.5% but art investment is more profitable than government bonds and gold, which

[1]See [Anderson 1974, Frey and Pommerehne 1988, 1989a, 1989b, Pesando 1993, Mei and Moses 2002, Worthington and Higgs 2003, 2004, Campbell 2004, 2008, Hsieh et al. 2010, Higgs 2012, Kraeussl and Wiehenkamp 2012, Sokołowska 2012, Frey and Cueni 2013].

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yield returns 2–3%, and it is comparable to corporate bonds that gave also 4% average annual return. However risk measured by standard deviation is the highest for gold (more than 24%), than for art (10%), equities (16.5%), government bonds (less than 11%) and corporate bonds (9.5%). Regardless above discussed results investment in art seems to be comparatively safe asset class that can serve as hedging instrument against inflation and create possibility to diverse the investment portfolio since art is not correlated with equities or bonds but associated with tangible assets as gold or commodities.

The aim of the paper is to describe the art market in Poland and evaluate the art price index for selected Polish painters whose artworks were sold at auctions. In our research we apply hedonic index methodology to estimate changes of prices at the paintings market in the years 2007–2010. Investigation is conducted using data collected from auction houses concerning 750 paintings created by 11 Polish artists.

SITUATION OF THE ART MARKET IN POLAND

Art market in Poland has been developing since the beginning of political and economic transformation in 1989. New art galleries and foundations together with auction market have been created (see Fig. 1). After deep depression of the Polish economy in the 1990s the level of life of the society has been essentially increasing that causes the increase of the demand for luxury good and art that is visible in Table 1.

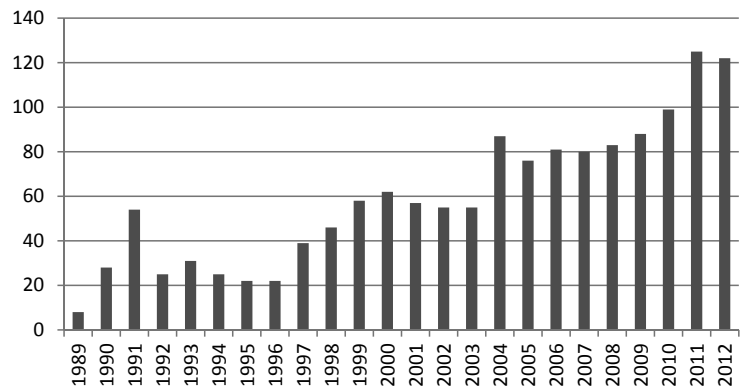

Fig. 1. Number of art auctions in years 1989–2012
Source: Skate's Focus [2013, p. 13].

Table 1. Development of the art market in Poland in recent years

Specification	2005	2009	2010	2011	2012
Art galleries	292	346	370	352	344
Exhibitions	3 640	4 232	4 296	4 406	4 225
of which foreign	291	344	255	334	275
Expositions	4 018	4 537	4 606	5 235	4 427
Visitors (in thous.)	2 955.9	3 990.0	3 967.8	4 173.7	3 684.9

Source: Culture in 2012 [2013, p. 102], http://www.stat.gov.pl/gus/5840_1741_PLK_HTML.htm.

In 2012 the Polish art market value was estimated for 300–350 millions PLN while auction sales was 60.5 millions PLN [Deloitte report 2013], and it was the highest result from 1989. The structure of the Polish art market is presented on Figures 2 and 3. The term "ultra-contemporary" is used for young artists (under 40 years old) – 44% of artworks sold with capitalization of 8%. Price relations at the art market are presented on Figure 4.

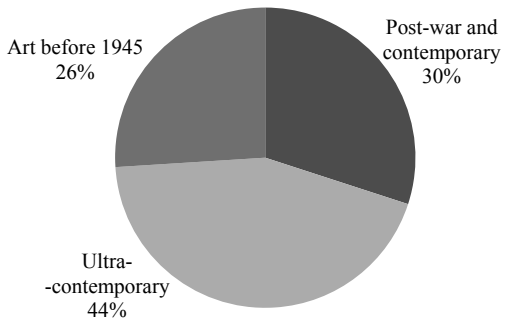

Fig. 2. Polish auction market segments in 2012 by lots
Source: Own elaboration on the basis of data from Skate's Focus [2013, p. 14].

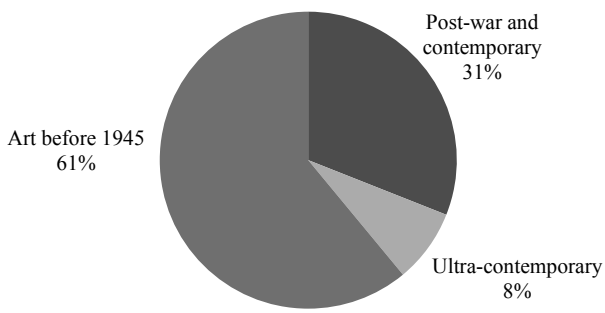

Fig. 3. Polish auction market segments in 2012 by value
Source: Own elaboration on the basis of data from Skate's Focus [2013, p. 14].

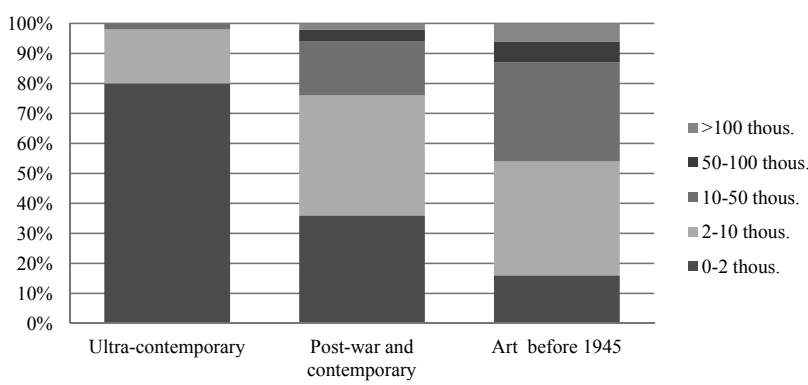

Fig. 4. Average price distribution of Polish Art Market Segments in the first half of the year 2012
Source: Own elaboration on the basis of data from Skate's Focus [2013, p. 15].

There are no individual sales organized for Old Masters and Modern Art in Poland, therefore the main threshold for art market segments is used year 1945 because until 1989 all artworks and crafts, that had been produced before 1945, were treated as national heritage. Therefore it is difficult to compare the structure of Polish to the world art market (Fig. 5) since "modern art" includes artistic works produced during the period extending roughly from the 1860s to the 1970s.

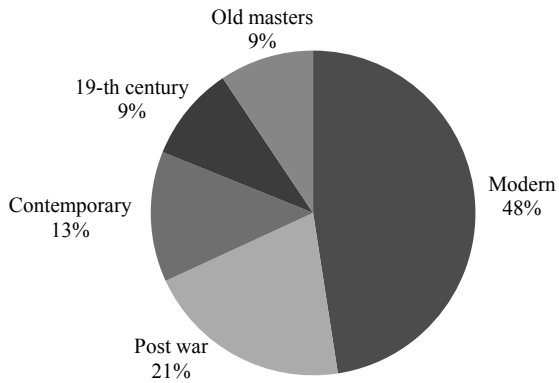

Fig. 5. World art market structure turnover
Source: Contemporary art market [2013, p. 10].

Analysis of the Polish art market in terms of medium is visible on Figures 6 and 7, and one can see that paintings are the most popular in comparison to other forms of art both in terms of number of lots (56%) and value of transactions (72%).

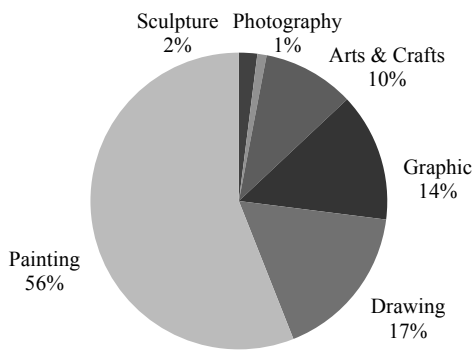

Fig. 6. Mediums on the Polish auction market in the first half of the year 2012 by lots
Source: Own elaboration on the basis of data from Skate's Focus [2013, p. 18].

At present there are nearly 800 museums (87% of them are public) and about 350 art galleries in Poland regardless private collections, art dealers, and antique shops (see Fig. 8). One should also notice that Polish market is geographically centralized with the greatest part of auction turnover coming from the auctions that take place in Warsaw, although large sales are also held in some other cities (Łódź, Kraków, Katowice, Poznań,

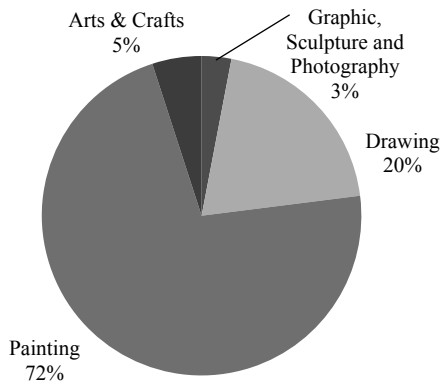

Fig. 7. Mediums on the Polish auction market in the first half of the year 2012 by value
Source: Skate's Focus [2013, p. 19].

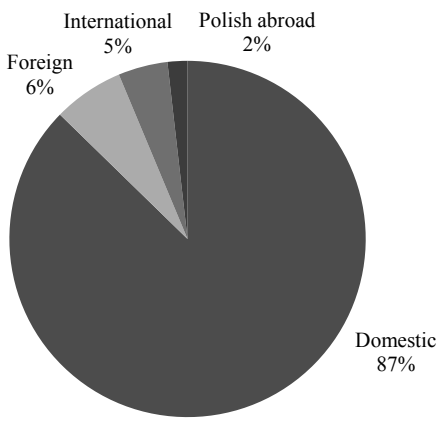

Fig. 8. Structure of exhibitions in art galleries in 2012
Source: Culture in 2012 [2013, p. 129], http://www.stat.gov.pl/gus/5840_1741_PLK_HTML.htm.

Toruń and Częstochowa). However in Warsaw the value of sales was 62 millions USD in 2000 and 105 millions USD in 2010 while in other cities it was 6.3 and 6.8 millions USD in the years 2000 and 2010 respectively [Culture in 2012, 2013, p. 102, http://www.stat.gov.pl/gus/5840_1741_PLK_HTML.htm].

There are also several auction houses and one Art Fund – Abbey Art Fund established in 2011. According to the Deloitte report from 2013, average annual return from 800 repeat sales that took place in Poland during last 20 years was 25.7% while in the same time equity returns measured by Warsaw Stock Exchange Index WIG20 was only 8.7% [Skate's Focus 2013]. Annual return from artworks hold longer than 15 years was 46.6% while investments with the horizon shorter than 5 years gave only 0.2% profit. Therefore the time span of investments is crucial in obtained returns.

Polish artists have been also present at the international scene although their representation is pretty narrow (Fig. 9). There are five Polish artists whose works exceeded

a threshold price of 1 million USD: Tamara de Lempicka, Henryk Siemiradzki, Roman Opałka, Max Weber and Piotr Uklański. Together they achieved a total capitalization of 99.3 million USD (for 35 lots), while Tamara de Lempicka alone achieved 87.2 million USD obtained for 26 artworks [Skate's Focus 2013, p. 5]. It is also worth mentioning that among Top 500 Contemporary Artists 2012/2013 two Polish artists are mentioned: Piotr Uklański (born in 1969) on the 314-th position, and Wilhelm Sasnal (born in 1972) on the 401-st position in the ranking.

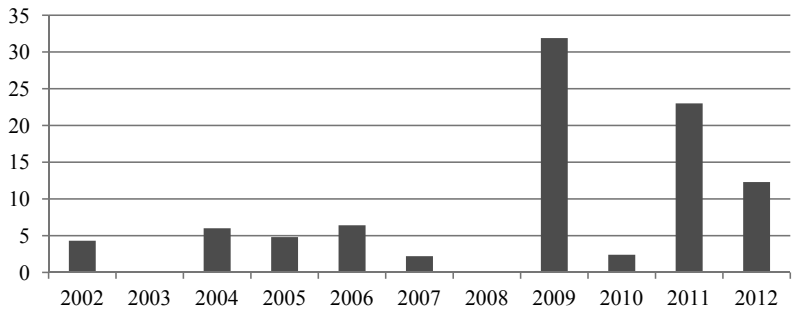

Fig. 9. Total trading value of Polish artists at global auctions (millions USD)
Source: Skate's Focus [2013, p. 5].

CONSTRUCTION OF HEDONIC INDEX

Artworks are heterogeneous assets, with a variety of physical and non-physical characteristics that make them unique, including artist reputation, materials used, the period of production and subjective traits like quality. Therefore the price of an artwork depends on these characteristics. The hedonic approach let us estimate the value attached to each one of the attributes that are deemed to be significant in the determination of the price and evaluate the price index with the hedonic quality adjustment (*HQA*). Thus hedonic price index (*HI*) can be written as follows[2]:

$$HI_{t+1} = \frac{\prod_{i=1}^{n}(P_{i,t+1})^{1/n} \Big/ \prod_{i=1}^{m}(P_{i,t})^{1/m}}{HQA_{t+1}} \tag{1}$$

where: $P_{i,t}$ – price of artwork i at time t;

[2]Hedonic price indexes are discussed by Dziechciarz [2004, 2005], Nesheim [2006], Triplett [2006] and Widak [2010], while their application on the art market by Candela et al. [2004], Kraeussl and van Elsland [2008], Kraeussl and Wiehenkamp [2012] to mention some research provided for developed art markets. However the first attempt to construct hedonic art price indexes for emerging markets was made by Kraeussl and Logher [2010] who consider art markets in China, Russia and India. The attempt to evaluate hedonic price index for Polish paintings is made by Kompa and Witkowska [2013].

$$HQA_{t+1} = \exp\left[\sum_{j=1}^{k}\hat{\alpha}_j\left(\sum_{i=1}^{n}\frac{X_{ij,t+1}}{n} - \sum_{i=1}^{m}\frac{X_{ij,t}}{m}\right)\right] \tag{2}$$

where: $X_{ij,t}$ – j-th characteristic of the artwork i at time t;
m, n – numbers of lots (i.e. artworks) sold in the period t and $t + 1$ respectively;
$\hat{\alpha}_j$ – parameter estimate standing by the j-th variable in hedonic regression (pooled regression).

Hedonic regression in this case usually takes the following form:

$$\ln P_{i,t} = \alpha_0 + \sum_{j=1}^{k}\alpha_j X_{ij,t} + \sum_{t=1}^{\tau}\beta_t Z_{i,t} + \varepsilon_{i,t} \tag{3}$$

where: α_j, β_t – regression parameters;
Z_t – time dummy variable, which takes the value 1 if painting i is sold in period t, and takes the value 0 otherwise;
$\varepsilon_{i,t}$ – disturbance term.

The numerator in (1) can be treated as the naive price index (*NI*), since it describes the so-called average painting [Candela et al. 1997] from the aggregation of all artworks that create the sample representing the art market or it's segment:

$$NI_{t+1} = \frac{\prod_{i=1}^{n}(P_{i,t+1})^{1/n}}{\prod_{i=1}^{m}(P_{i,t})^{1/m}} \tag{4}$$

The explanatory variables are either intrinsic characteristics of the artwork, such as the artist, size, format, technique, materials, period, signature and artist's living status or related to the sale, including the auctioneer, location and date of sale. The dependent variable in the model is usually represented by the natural logarithm of the sales price. All auctions relating to an artist are included in the estimation in order to avoid selection bias. The time dummy variables can be annual, semi-annual, quarterly or even monthly depending on the frequency of trading.

Having price indexes describing price relation in two neighbouring periods t (t = 1, 2, …, T), i.e. I_1, I_2, ..., I_t, we may calculate the price index (TI_t) concerning price changes in comparison to the first (t = 0) period of analysis:

$$TI_t = I_1 \cdot I_2 \cdot \ldots \cdot I_t \tag{5}$$

Therefore the total index (TI_T) informs about price movements during the whole period of investigation since it is the relation of prices in the last period $t = T$ in comparison to the first period t = 0. Then changes of prices from period to period equal $C_t = (I_t - 1) \cdot 100\%$, while price movements in every moment in comparison to the first period of

analysis equal $TC_t = (TI_t - 1) \cdot 100\%$. In other words C_t informs about returns for every single period while TC_t – about returns obtained in the period from $t = 0$ to t, and TC_T is the cumulative return in the whole period. It is also possible to evaluate the average return for the single period taking into account the total returns from the whole period of investigation, employing geometric mean:

$$GM = \sqrt[T]{\prod_{t=1}^{T} I_t} = \sqrt[T]{TI_T} \tag{6}$$

In such a case average return in the single period equals: $G = (GM - 1) \cdot 100\%$.

DESCRIPTION OF DATA AND VARIABLES

Hedonic models are estimated employing data[3] from auctions of paintings held by auction houses and foundations in Poland in the years 2007–2010. In these years number of transactions was comparable although the highest value of transactions was observed in the year 2008 (Table 2). The whole database contains 10,400 objects produced by nearly 3,000 artists who represent different periods and styles. As a result, also the range of prices is huge from 20 PLN for a piece produced by Justyna Jakóbowska (born in 1984) to 1.1 million PLN for an artwork by Władysław Czachórski (1850–1911), with average price for a single lot 8,691 PLN and standard deviation 33,698 PLN. Therefore to analyze prices authors construct the sample of artworks, painted by the artists who are selected according to the biggest number of lots sold in the investigated period (Table 3). The biggest number of lots sold in analyzed period are produced by Jerzy Kossak (91) while the highest value of transactions concerns artworks by Malczewski (more than 1 million PLN). In authors' sample, the lowest average value for the single artwork obtained paintings by Nikifor (2,486 PLN). The selected sample covers 7.2% of all lots and 16.2% of the turnover registered in the database.

In authors' investigation several explanatory variables were used that are usually used in hedonic models constructed for the art price that describe artist and exhibitor reputa-

Table 2. Transactions in years 2007–2010

Year	Number of lots (pcs)	Value (PLN)	Average value of one transaction (PLN)
2007	2 493	39 217 845	15 731
2008	2 548	58 707 150	23 040
2009	2 427	36 713 800	15 127
2010	2 932	25 675 900	8 757
Total	10 400	160 314 695	15 415

Source: Own elaboration.

[3]The basic data base was constructed by Lucińska [2012].

Table 3. List of Polish painters whose artworks created the sample

Variable artist	Year of		Artworks sold in 2007–2010			Standard deviation	Variability coefficient
	birth	death	count (pcs)	value (PLN)	average value (PLN)		
Chmieliński Stachowicz Władysław	1911	1979	55	648 200	11 785	6 425.22	0.55
Dominik Tadeusz	1928	–	46	608 000	13 217	7 498.63	0.57
Dwurnik Edward	1943	–	63	431 300	6 846	5 823.47	0.85
Erb Erno	1890	1943	58	816 500	14 078	6 581.61	0.47
Kossak Wojciech	1856	1942	60	2 027 500	21 377	17 286.18	0.81
Wyczółkowski Leon	1852	1936	61	3 848 300	13 857	11 050.24	0.80
Hofman Wlastimil	1881	1970	85	1 817 050	33 792	38 702.58	1.15
Kossak Jerzy	1886	1955	91	1 261 000	132 413	156 276.36	1.18
Malczewski Jacek	1854	1929	71	9 401 300	2 486	1 021.37	0.41
Nikifor Krynicki	1895	1968	79	196 400	70 453	65 808.64	0.93
Nowosielski Jerzy	1923	2011	81	5 706 700	63 087	108 969.00	1.73
Sum	×	×	750	26 762 250	×	×	×

Source: Own elaboration.

tion, type and quality of the artwork as well as conditions of the transaction. Auction house describes the reputation of the auctioneer and this variable is specified as a number of dummies defined name of auctioneer (Table 4). Reference variant of this variable is: other auctioneers. There are 41 auction houses in the whole database, which essentially differ by number and value of transactions. The biggest in value and number of lots sold auctioneers are Rempex and Agra-Art. The former sold the biggest number of lots – 1,558 paintings worth 32.5 million PLN and the latter had the highest value of transactions – 47.9 million PLN for 1,515 paintings sold in years 2007–2010.

Artist reputation is defined by the name of a painter that is represented by the variable artist, and Wyczółkowski is the reference painter (Table 3). Type and quality of the art piece is defined by several variables, such as: signature, technique and surface (of the painting). Technique and materials describe type of work and this variable is specified as a number of dummies that indicate whether the art piece represents certain type of work (Table 4). Reference variant of the variable is: other techniques. Signature is one of the artworks' attributes, it equals 1 if signature is visible. Surface (measured in square centimeters) of the artwork is the most commonly used variable that describes the physical characteristics of paintings. In general the parameters estimates for this variable should be positive however larger works may be difficult to display thus in some models squared surface is applied. Authors use natural logarithms of surface area.

Conditions of the transaction is represented by two variables: *y*ear and price relation. Year of sale is a set of binary variables defined the year of transaction. Reference variant of this variable is: Year_2010. Price relation between reserve and hammer price is represented by the variable equals 1 if the former price is bigger than the latter one since in such a case sale might not take place (so-called conditional sale).

Table 4. List of auction houses and techniques

Variants of variable		Number of observations	Average	Standard deviation	Variability coefficient
Auction house	Agra-Art	220	48 627	111 443.3	2.29
	aukcje on-line	7	3 057	1 513.11	0.49
	Desa	61	23 825	65 895.81	2.77
	Desa Unicum	105	115 866	241 391.1	2.08
	Okna Sztuki	20	44 665	57 486.78	1.29
	Ostoya	50	13 061	11 815.79	0.90
	Polswiss Art	73	87 564	126 193.0	1.44
	Rempex	270	21 948	34 652.96	1.58
	Rynek Sztuki	114	3 385	6 884.65	2.03
	other auctioneers	48	4 044	3 894.39	0.96
Technique	acrylic	53	13 407.55	28 498.5	2.13
	watercolour	148	9 369.932	13 938.5	1.49
	gouache	53	18 055.66	17 645.1	0.98
	oil	596	54 890	135 079.7	2.46
	pencil	15	8 920	8 621.3	0.97
	pastel	33	47 627.27	104 313.6	2.19
	tempera	16	27 431.25	28 519.0	1.04
	drawing ink	9	13 033.33	8 184.1	0.63
	other techniques	45	16 724.67	32 771.7	1.96

Source: Own elaboration on the basis on Sopińska [2013] who used sample containing 968 objects with additional artists.

ART PRICE INDEXES

The aim of this research is to describe how the prices of the paintings changed in the analyzed period. Authors start their investigation from evaluation of the naive price index, that is the numerator in the relation (1). Then, employing information about artworks produced by selected painters and sold on auctions in Poland in the years 2007–2010, they estimate models of art prices (3). Last step of this research is to evaluate the hedonic quality adjustments (2) and art price indexes (1).

In Table 5 parameter estimates of selected models[4] is presented, estimated by OLS. Models H1 and H2 contain all distinguished variables, however the size of the artwork in H1 is described by squared surface. While in the model H3 variable: price relation is omitted. Model H1 is characterized by the highest adjusted R^2. In all models variables: signature and price relation are not significant. Name of the painter affects significantly price of the artwork, and for all authors except Malczewski this influence is negative because Wyczółkowski's paintings take the second place (after Malczewski) among the most expensive ones in average. Surface (of the paintings) influences positively and significantly the artworks' price. Variants of technique and materials used for the art piece production are significant in presented models, except watercolor and gouache (although not in all of them). While auction houses, except Desa, are significant in majority of models, and time dummies for years 2007 and 2010 are not significant in all models.

[4]In this research about 60 variants of models describing prices of Polish paintings were estimated, see Kompa and Witkowska [2013], Witkowska [2014], Witkowska and Kompa [2014]. Presented models are selected as the best ones from the group of models containing different variable sets.

Table 5. Estimated models

Model		H1		H2		H3	
Variables		Parameter estimates		Parameter estimates		Parameter estimates	
Constant		5.0405	***	2.7877	***	2.7934	***
Year	YEAR_2007	0.0067		0.0934		0.0971	
	YEAR_2008	0.0007		0.0758	**	0.0768	**
	YEAR_2009	0.0019		0.0145		0.0154	
Auction house	Agra-Art	0.0834	**	0.2945	**	0.2989	**
	Desa	0.0844		0.1990		0.2013	
	Desa Unicum	0.0550	***	0.4084	***	0.4026	***
	Okna Sztuki	0.0701	**	0.4798	***	0.4816	***
	Ostoya	0.0642	***	0.0998		0.1032	
	Polswiss	0.0717	***	0.8052	***	0.7968	***
	Rempex	0.0606	***	0.0895		0.0807	
	Rynek Sztuki	0.0504	**	0.0172		0.0080	
Author	Kossak J.	–0.0566	***	–1.5906	***	–1.5896	***
	Kossak W.	–0.0318		–0.8769	***	–0.8780	***
	Chmieliski	–0.0601	***	–1.2274	***	–1.2266	***
	Dwurnik	–0.1413	***	–2.2824	***	–2.2810	***
	Erb	–0.0420	**	–1.0908	***	–1.0864	***
	Hofman	–0.0484	**	–1.0883	***	–1.0862	***
	Malczewski	–0.1007	***	0.3115	***	0.3125	***
	Nikifor	–0.2556	***	–1.3326	***	–1.3319	***
	Nowosielski	–0.0471	***	–0.1185		–0.1186	
	Dominik	–0.0594	***	–1.9053	***	–1.9050	***
Signature		–0.0038		–0.0435		–0.0457	
Technique	watercolour	–0.0155		0.1968		0.1991	
	acrylic	0.0448		0.6975	***	0.6998	***
	gouache	–0.0038		0.2849		0.2918	
	oil	0.0561	**	0.8856	***	0.8869	***
	pencil	–0.0704	**	–0.2460		–0.2453	
	pastel	0.0336		0.4502	**	0.4525	**
	tempera	0.0296		0.6350	***	0.6377	***
	drawing ink	–0.0171		–0.5984	**	–0.5986	**
Price relation		–0.0065		–0.0273			
Surface area				0.5646	***	0.5636	***
Squared surface area		0.0484	***				
Parameters describing quality of the hedonic model							
Adjusted R^2		0.9953		0.8114		0.8115	
F statistics		4910.11	***	101.68	***	105.07	***
Degrees of freedom		(32; 717)		(32; 717)		(31; 718)	
Akaike information criterion		–1 492.91		1 269.1		1 267.3	
Autocorrelation coefficient		0.2588		0.0330		0.0306	
Durbin-Watson statistics		1.4808		1.9311		1.9359	

Stars denote significance level of explanatory variables* – 0.1, ** – 0.05, *** – 0.01.
Source: Own elaboration.

Parameter estimates of the models (3) are used to evaluate hedonic quality adjustments (2), and, finally, price indexes. Having the value of the price index we may evaluate returns from the investment in art (Table 6). Analyzing naive indexes calculated for 11 artists, one can notice that in the years 2007–2010 prices of art were changing. We notice the essential increase of prices (nearly 50%) in 2008 in comparison to 2007, while in 2009 prices decreased by 38% in comparison to the previous year, and they declined again in 2010 by 5.6%. Thus as a result art prices dropped in 2010 in comparison to 2007 by 12.8%. Investment in Polish paintings made in 2007 generated annual average losses 4.5% due to naive index, and slightly more than 3% if hedonic indexes based on the models H2 and H3 are used. While hedonic index constructed on the basis of the model H1 shows positive annual returns equal about 2%.

Table 6. Hedonic art price indexes

Year	Type of index	HQA	Price index for basic period		Changes (%) according to		Average annual changes	
			previous year	year 2007	previous year	year 2007	geometric mean	%
2008		naive	1.4984	1.4984	49.84	49.84		
2009			0.6163	0.9235	–38.37	–7.65		
2010			0.9441	0.8718	–5.59	–12.82	0.9553	–4.47
2008	hedonic H1	1.1029	1.3586	1.3586	35.86	35.86		
2009		0.6596	0.9344	1.2695	–6.56	26.95		
2010		1.1313	0.8345	1.0594	–16.55	5.94	1.0194	1.94
2008	hedonic H2	1.4137	1.0599	1.0599	5.99	5.99		
2009		0.6867	0.8975	0.9513	–10.25	–4.87		
2010		0.9860	0.9575	0.9108	–4.25	–8.92	0.9693	–3.07
2008	hedonic H3	1.4160	1.0582	1.0582	5.82	5.82		
2009		0.6862	0.8981	0.9504	–10.19	–4.96		
2010		0.9887	0.9549	0.9075	–4.51	–9.25	0.9682	–3.18

Source: Own elaboration.

Hedonic quality adjustment essentially affected price indexes – when evaluated on the basis of the models, does not change the general direction of price movements represented by naive indexes year by year. However observed changes, represented by hedonic indexes, seem to be smoother than the ones given by the naive indexes. Also taking into account price changes in the whole four-year period one may notice that indexes, evaluated on the basis of the model H1, show the increase of prices by 5.9% in 2010 in comparison to 2007 (average annual change is positive and equals 1.9%), while indexes obtained for the models H2 and H3 show losses, i.e. the similar results as naive indexes.

CONCLUSIONS

Investment in art becomes more and more popular in Poland that is proved by comparison of number of art auctions that took place in years 1989–2012. Also number of art galleries and exhibitions has been increasing although financial crises influenced also

art market and caused reduction of art prices. In Poland paintings are the most popular medium both in lots and value of transactions. Therefore in authors' investigation only this segment of the art market was considered, constructing the research sample from the artworks produced by artists who are characterized by the biggest number of sold paintings on auctions in years 2007–2010. Employing this sample authors evaluate naive and hedonic indexes that are to represent the general tendency at the Polish market of paintings.

Comparing situation on the art market one may notice that decline of art prices became visible in 2009, while the main index of the Warsaw Stock Exchange – WIG decreased by 51% (in 2008 in comparison to the previous year). As a result of financial crisis in 2010 the decline of WIG was by 15% in comparison to the year 2007. In that period the decrease of art prices was less than 13% for the naive index, and less than 10% due to hedonic indexes evaluated on the basis of the models H2 and H3.

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CENY MALARSTWA NA RYNKU SZTUKI W POLSCE W LATACH 2007–2010 – ZASTOSOWANIE INDEKSÓW HEDONICZNYCH

Streszczenie. Rynek sztuki w postkomunistycznej Polsce rozwija się już od 25 lat, chociaż jest to wciąż rynek mały, którego obroty w 2012 roku stanowiły 0,2% światowego rynku. W związku z tym celem badań jest opis aktualnego stanu rynku sztuki w Polsce oraz oszacowanie indeksu cen malarstwa na podstawie prac 11 artystów, których dzieła najczęściej znajdowały nabywców na aukcjach, które odbyły się w Polsce w latach 2007–2010. W artykule zbudowano indeksy hedoniczne, wykorzystując dane dotyczące 750 sprzedanych obrazów, które pozwoliły oszacować zmiany cen na rynku polskiego malarstwa. Wyniki analiz pokazały, że hedoniczna korekta jakościowa istotnie wpływa na ocenę cen dzieł.

Słowa kluczowe: rynek sztuki, hedoniczny indeks cen, inwestowanie

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SMART SPECIALISATION – A NOVEL APPROACH TOWARDS REGION DEVELOPMENT IN POLAND

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Abstract. This article describes smart specialisation, a new mechanism for stimulating economic development in regions and EU member states. The aim of the article is to present theoretical assumptions behind this notion in the context of regional policy. The article, by critically analysing the research literature, describes the creation process of smart specialisation and attempts at identifying the potential areas of smart specialisation in the Polish regions. Smart specialisation is a new and hotly debated topic, as witnessed by a number of theoretical and empirical studies related to this notion worldwide.

Key words: smart specialisation, Europe 2020 strategy, regional development, EU regional policy

INTRODUCTION

Smart specialisation, which aims at the optimal use of development potential of EU member states and regions by possibly best adjustment of scientific activities to the specific socioeconomic conditions, is the direction set for the member states by European Commission for the period 2014–2020. According to EU's Directorate-General for Regional Policy, such a specialisation can increase the competitiveness of regions and, as a result, increase their rate of development.

Smart specialisation is a novel approach of EU towards regional policy. The basic assumption behind smart specialisation is to increase innovativeness and competitiveness of regions on the basis of their endogenous potential and the industries that are already functioning there. It can involve specialisations within a single sector as well as broader enterprises, spanning several sectors, allowing the achievement of specific competitive advantage.

The idea of the development policy based on innovation and entrepreneurship focused on specific areas of specialisation is reflected in the most important document emphasis-

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ing the importance of modern technological advances and setting the direction for further development of the EU policy in terms of innovation, the Europe 2020 strategy [Europe 2020. A European strategy for smart, sustainable and inclusive growth 2010]. European Commission emphasises that defining smart specialisations is going to be crucial for the realisation of the so-called smart growth priority: that is the economic development based on knowledge, which includes innovations.

At the same time, EU's cohesion policy requires that the evaluation of smart specialisation effects is based on measurable criteria allowing the comparison of rate and level of development of regions, hence striving for elimination of the differences that prove detrimental for their inhabitants. Such criteria also allow the evaluation of the current state of affairs and the development level of regions as well as determining the challenges ahead [Evidence-based Cohesion Policy and its role in achieving Europe 2020, 2011, McCann, Ortega-Argilés 2011].

European Commission moves away from supporting the weaker EU regions in their imitative approach to development consisting in copying the development process observed in the more advanced regions. T.G. Grosse [2013] emphasises that "the weaker regions should look for their own development path and a market 'niche' allowing them to become internationally competitive". The Commission, in the Common Strategic Framework for 2014–2020, proposes that the technologically advanced regions focus on keeping the top position, whereas the less developed regions try to catch up and create their own "paths to perfection" [Elements for a Common Strategic Framework 2014 to 2020, 2012].

Smart growth is one of the basic elements of interventions and implemented priorities, related to the general approach presented in the Europe 2020 strategy, according to which the productivity and innovativeness ensure efficient and increase the long-term chances of continuing economic development of Europe. Smart actions, stimulating knowledge- and innovation-based economic growth, consist not only of research but also of promoting other forms of innovation (of social, organisational kind but also including improved marketing strategies, new services and business plans), with the key factor for supporting smart growth being the push for increased innovation capabilities in regions [Markowska, Strahl 2013, Regulation (EU) No 1301/2013 of the European Parliament and of the Council 2013].

The measurable results to be achieved by 2020 in terms of smart growth on the EU and national levels include: 75% employment rate for people in the 20–64 age range, 3% GDP investment rate on the R+D activities, lowering the school dropout rate to 10% as compared to 15% today, 40% share by people with higher education in the 30–34 age range [Europe 2020. Flagship Initiative Innovation Union 2010, Skawińska 2014].

MATERIAL AND METHODS

Smart specialisation – the core idea

Smart specialisation was introduced by the Knowledge for growth Expert Group the group was established in 2005 by European Commissioner for Research – J. Potočnik. Prof. D. Foray is the creator and the leading expert on the notion of smart specialisation.

The main assumptions were presented in the working documents of the Expert Group [Foray et al. 2009] as well as in the report containing suggestions related to the functioning of the European Research Area[1] [The role of community research policy in the knowledge-based economy 2009]. Intelligent specialisation is also promoted by the Synergies Expert Group, established by the European Commission's Directorate-General for Research and Innovation and is considered an important component enabling synergies between Horizon 2020 and structural funds in the context of developing potential and striving for perfection [Guide to Research and Innovation Strategies for Smart Specialisation (RIS 3) 2012]. Also, the Committee of Regions [Europe 2020. Flagship Initiative Innovation Union 2010], World Bank and OECD [Innovation-driven Growth in Regions: The Role of Smart Specialisation 2013] engage in promoting smart specialisation by means of comparative research including all the EU regions.

The topic of smart specialisation has been connected with the notion of regional development within the EU and the institutional character of its research and development sectors as well as the actions that aim at improving the quality of public interventions in terms of research and innovation, including the integrated approach and the conditionality principle [Kardas 2012].

The S3 Smart Specialisation Platform is a new network of European regional representatives and experts aiming at supporting regions in designing and implementing smart specialisation strategies and promoting efficient, effective and synergic use of public investments in order to achieve innovative development by creating multifarious strategies and promoting good practices within the regions [Słodowa-Hełpa 2013a]. The Platform, steered by the Institute for Prospective Technological Studies (IPTS) does not offer ready-made solutions and serves instead as a medium for contact and exchange of views and experiences, providing ideas, guidelines and access to case studies and methodology. The Guide to Research and Innovation Strategies for Smart Specialisations (RIS3) is a publication ordered by the European Commission, presenting the principles behind creating a new version of regional innovation strategies for 2014–2020.

Smart specialisation requires a deep analysis of resources and identification of distinguishing unique features and strengths of each region and on its competitive potential and focusing the regional partners and resources around the vision of their achievement-oriented future [Ejdys, Lulewicz-Sas 2013, Słodowa-Hełpa 2013a]. It includes companies, research centres and universities that work together to determine the most promising areas of specialisation for a given region, but also to identify the weaknesses hindering the introduction of innovation. It takes into account the differences in the economic potential of regions from the point of view of innovation [Regional Policy contributing to smart growth in Europe 2020, 2010]. This means a support of the regional innovation systems, help in maximising knowledge flow and spreading the benefits related to innovation within the entire regional economy.

Smart specialisation is the way in which innovation strategies are being formulated and a tool used to identify and develop the present and future position of a given region

[1]The notion has been therefore proposed by the experts (mostly academics) during the discussion on the role European Research Area in the context of ongoing globalisation, clustering and networking and the growing importance of global challenges.

or state in the knowledge-based economy [Foray et al. 2009]. There are four main assumptions behind smart specialisation [Kardas 2011, Ejdys, Lulewicz-Sas 2013]. The first is the creation of research and innovation area allowing limitless competition. The European Research Area (ERA) can be considered a case in point here, understood as integrated, multinational space ensuring full mobility of resources (e.g. free knowledge flow) and minimising the structural obstacles related to competitiveness (e.g. ensuring low entry level conditions for the potential competitors). Such an area should allow a better usage of: scale, range and spill-over effects. The second assumption is that if all European regions or member states are going to compete for the topmost position in the same area of science, then most of them is not going to achieve their goal as a result of lack of the required critical mass and scale and range effects. The optimal solution is to focus on those areas of science and innovation that are complementary to the resources of a given region and will contribute to the creation or strengthening of its comparative advantages. Smart specialisation is therefore based on a close link between research and development activity, human capital development (employees' qualifications and skills) and the economic characteristics of these regions or states. Smart specialisation should result in an increase in regional diversification in the EU in terms of specialisation related to various areas of science and technology and sectors of economy. The third assumption is related to the so-called general purpose technologies (GPTs)[2]. These can function as the so-called enabling technologies, that is creating the possibilities for growth instead of complete final solutions. The general purpose technologies function on the basis of the so-called basic technology, which is a radical turning point when compared to the technological solutions in use today as well as on the basis of capital goods that are designed to use the basic technology as a part of ready-made products and services. The relation between basic technologies and their practical implementations can be described as a feedback mechanism. Basic technologies create new possibilities in terms of developing product and services. Whereas, the latter increase the implementation scope of the former, increasing the return rate connected to their design and development. The list of general purpose technologies is not closed and the technologies themselves are presented with various levels of specificity: from concrete inventions (a steam engine, a generator) to types of technology (mechanical, IT) or areas of science. The fourth assumption related to smart specialisation deals with the way it is to be implemented, and especially with the role to be played by public administration in that respect. Smart specialisation is neither determined in a top-down manner by the administration in a form of development plans (e.g. strategies or development programmes) nor within the foresight projects as prepared by external advisors. Instead, it is an "entrepreneurial" process of learning indicating in which area of science and technology a given region or a state can become a leader in Europe and in the world.

[2]The general purpose technologies are defined by indicating their main, characteristic, features. Such technologies are – ubiquitous and find applications in many areas of human activity (in the past, it was for example a steam engine or a generator, nowadays: semiconductors and the Internet) – a subject of continuous technological improvement that increase their effectiveness – such that their application requires complementary investments in the sectors that are using them (feedback between the technologies and sectors).

The analysis of the notion of smart specialisation indicates that it aims at the optimal use of the potential behind a given region or a member state by focusing on the potentially optimal matching of the direction, in which science and education is developed with the specific socioeconomic conditions found in a given area: that is a combination of the three important elements: science – education – economy (it is worth pointing out that such recommendation was already formulated in 1992 by D. Archibugi and M. Pianta [1992]). This means focusing public interventions on such initiatives, actions and projects that enable specialisation of a given region or state in relation to either basic technologies development or the development of products or services using such technologies.

Implementing smart specialisation is expected to result in strengthening of a given area in terms of its specialisation by, for example, adjusting educational environment to the requirements of a given region and supporting and funding the development of sciences. M. Słodawa-Hełpa [2013a] indicates that the aim of smart specialisation is to reach the critical mass level in terms of key competitive areas and sectors; the spreading of the general technologies, especially by their use in products and services and the strengthening of local potential in terms of innovative activity. Using knowledge and specialised research and development actions, which are appropriate for their socioeconomic character, regions are expected to perfect in a given area, enabling them to compete on international markets by:

- determining, on the basis of an analysis aimed at identifying strong points and weaknesses as well as the growth possibilities and developmental tendencies, a number of investment priorities in relation to the specialisation areas and using this as an advantage;
- mobilising talents by combining the needs with the potential of the R+D sector and business as well as by using knowledge and specialised R+D activity, closely related to the socioeconomic needs of a given region;
- going towards cluster development and creation of space for the development of various relations between sectors that influence the diversification processes in terms of increased participation in multi-regional networks;
- including in the pro-innovative processes not only academic institutions, companies and public authorities but also the recipients, that is the innovation users.

M. Słodawa-Hełpa [2013b] also emphasises that the most difficult task related to the requirements of smart specialisation are related to determining the socioeconomic identity of a region and localising the most promising specialisation areas. In this context, it is important to notice that the specific and unique resources are the most important factors behind the potential of a given region in the process of creating a sustainable competitive advantage. Such potential, rooted in the space and in a way "tied" to the region, cumulated and evolutionary created over long periods, is hard to be distinguished from the place of occurrence [Nowakowska 2008, Jewtuchowicz 2009]. Hence, the specific resources, rare in terms of their occurrences, are hard to imitate, copy and transfer by the competitors, and their creation in another space, despite large sums involved, is not guaranteed to succeed.

This unique character is not only related to the specific sector, in which the region is better than the "rest of the world" but can also be expressed in a specific interrelation between the already existing potentials found in economy tradition, culture, natural

resources, intellectual and social capital. These can include non-material resources, like those related to the notion of cultural identity, skills and capabilities, identity, organisational capabilities of regions, as well as the system of needs, aspirations and values shared by its inhabitants [Słodowa-Hełpa 2013a]. It is precisely the specific resources of a region, viewed as a part of global processes, that become key factor responsible for success. Having such resources decides about the uniqueness of the regional space and should be viewed as a base for endogenous development and a natural competitive advantage.

Not only technological but also social innovation and their combinations, e.g. new services and processes, marketing or branding, contribute to smart specialisation. Given the legitimate concern that smart specialisation is mainly associated with technological innovation, the representatives of European Commission's Directorate-General for Regional Policy assure that it is also consistent with the economic growth related to the promotion of natural produce, manufactured by hand in small series, which describes a large part of craftworks.

In Poland, the assumptions behind smart specialisation are included in the new long- and medium-term central strategic documents, with Strategy for Innovative and Effective Economy – Dynamic Poland 2020 describing its National Strategic Framework.

The documents indicating national specialisations in terms of research and innovation are: Polish Roadmap of Research Infrastructure, National Research Program and the foresight projects results, in particular of the technological foresight for industry project InSight 2030 [National Smart Specialisation 2014].

Polish Roadmap of Research Infrastructure is a Polish contribution to European Research Area, and of the European research infrastructure in particular. Polish Roadmap of Research Infrastructure covers 33 projects chosen, following competitive procedure, by experts from Poland and abroad. Such projects are consistent with the idea of creating research centres consolidating the national scientific potential in a given area, where strong research teams, recognisable on a national as well as on the international level, would be conducting research. The idea behind these centres is related to the notion of open access to the research tool on the basis of the criterion of scientific excellence.

The National Research Program indicates strategic directions for research and developmental actions, identifying the aims and assumptions behind a long-term research, technological and innovative national policy. The aim of the National Research Program is to focus public funding on prioritised research and development directions, from the point of view of the needs of the Polish society and competitiveness of Polish economy on the international marked. The National Research Program describes seven strategic, interdisciplinary directions of scientific research and developmental activities. The specified directions are as follows: (1) new energy-related technologies, (2) diseases of civilisation, new medicines and regenerative medicine, (3) advanced IT and mechatronic technologies, (4) modern material technologies, (5) natural environment, agriculture and forestry, (6) social and economic development of Poland in view of globalised economy, and (7) national safety and security.

Technological foresight for industry – InSight 2030, is a project identifying industrial areas and technologies that by 2030 will become a powerhouse of Polish economy and contribute to an increase in competitiveness and innovativeness of Polish industry. Analytical works were conducted in 10 horizontal Research Areas, allowing an identification

of 35 areas (the so-called leading markets) and 127 key technologies, where after the public consultations and meetings with the representatives of the respective industries, the list was verified and decreased to 33 areas and 99 technologies, grouped in the following Research Areas: (1) industrial biotechnologies, (2) photonic technologies, (3) micro--electronics, (4) advanced production methods and materials, (5) nanotechnologies, (6) IT technologies, (7) co-generations and rationalisation of energy use, (8) natural resources extraction technologies, (9) healthy society, and (10) green economy.

The cross-analysis of the priorities identified in Polish Roadmap of Research Infrastructure, National Research Program and Insight 2030 showed broad-ranging synergy and complementariness in the areas identified as key on the national level, which confirmed the consistency between the identified scientific and technological specialisation areas.

On a national level, Enterprise Development Programme until 2020 is also a basis for identification of smart specialisations. This document is a comprehensive catalogue of tools supporting the development of innovativeness and entrepreneurship in Poland. At the same time it is an executive program for the Strategy for Innovative and Effective Economy.

Also the Road plan for innovation in science and higher education is an important source in terms of region specialisation. The plan is an interactive presentation of investments designed or implemented in the area of science. The actions are presented for every region in relation to 25 areas of science.

One of the effects of designing the strategy for smart specialisation is the identification of smart specialisations and an identification of national priorities in terms of science and innovation policy and definition of goals and actions to be realised by 2020.

RESULTS AND DISCUSSION

Smart specialisation in regions

According to the assumptions behind smart specialisation, in order to increase region competitiveness, it is necessary to identify specific attributes of resources related to the specific character and potential of that region, as well as to define a concrete path for the future. The proponents of the idea of smart specialisation indicate that strategy for smart specialisation relies on the choice of a few priorities for R+D and innovative activity in the so-called entrepreneurial process of discovery. This means an engagement of the interested parties in the process of identification of the areas that determine or will determine the future development path of a given region. Among the interested parties, the leading role is assigned to the entrepreneurs, and the entrepreneurial knowledge in particular. This knowledge is a combination of information regarding science and technology, entrepreneurship, market potential for new products and services and the behaviour of current or future clients and competitors. Obviously it is entrepreneurs, who have a direct access to this type of knowledge but it is important to emphasise that research units can also be considered important sources in that respect [Foray 2011]. "The entrepreneurial process of discovery" relies on designing creative solutions by combining the available

resources and new partner, taking up risks, experimenting, searching for new ideas in the chain of values or becoming a part of new chains of values.

The representatives of local administration should be the initiators and coordinators of regional strategies for smart specialisation [Strzelecki 2012]. Local administration can be considered in many ways to be the closest to the citizens of the "world" of business and research units and hence able to generate a set of tools best matched to the local and regional resources. The aims of the strategy are predominantly related to an efficient use of public funding and stimulation of private initiative. The fundamental challenge faced by local administration is related to stimulating the endogenous development path, in such a way that it is less based on the dependent development model or that is not merely imitating external developmental patterns. The point is to search for an individual development path, adjusted to the local characteristics and at the same time to attempt to identify own competitive edge on a national and international levels.

The last element in the process of creation of regional strategy for smart specialisation is the definition of indicators used for monitoring and evaluation of both the strategy and the designed plan of action [Ejdys, Lulewicz-Sas 2013]. European Commission's communication entitled Regional Policy contributing to smart growth in Europe 2020 suggests that strategies for smart specialisation cover actions focused in clusters, create support for business environment (especially SMEs), stimulate life-long learning in the area of research and innovation, create or modernised research infrastructure and supported the development of advanced research centres. European Commission also suggests that the development of cultural and artistic centres can contribute to the creation of developmental niches for certain regions and that regions should focus on connecting the B&I actions with those aimed at promoting the digital agenda and properly directed public procurements. The Commission also indicates that the regional policy and European innovative partnerships both face a challenging international situation.

The subject literature contains an attempt at evaluating the area of smart growth of Polish regions as proposed by the investigators of the project entitled Classification of the European regional area in the context of smart growth – a dynamic approach. In order to identify and characterise smart specialisation in regions, it has been deemed necessary to use the appropriate econometric tools. The division of the European space using fuzzy *k*-means method allows the estimation of levels of membership of Polish regions in the distinguished classes [Jefmański, Markowska 2012, Markowska, Strahl 2012, Markowska, Strahl 2013].

In Poland, on a regional level, the diagnosed smart specialisations have been included in the updated voivodeship development strategies or regional innovation strategies. Table 1 presents the smart specialisation areas identified in Poland.

Within each voivodeship, the economic, scientific and technological areas are identified that can potentially become a regional specialisation. These are, however, variously defined. In general, one can distinguish two approaches: the first emphasises the ongoing development of current regional specialisation, so that in the future these become areas distinguishable on a national level as well as among other EU regions. The second approach focuses on searching and developing new areas, market niches, which are often found somewhere between the current specialisations.

Table 1. Smart specialisations in Poland

Details	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Bio-economy	■	■	■	■		■				■					■	■
Construction					■			■	■	■			■			
Water economy														■		
Energy management (including renewable resources)		■	■	■	■	■		■	■		■	■	■			
Marine economy											■					■
ICT/multimedia	■	■	■		■	■	■		■		■	■	■		■	■
Logistics		■									■				■	■
Aeronautics and space exploration									■							
Medicine		■	■		■							■				
Modern business services							■				■					
Environmental protection		■						■								
Plastic products manufacturing		■														
Chemical industry	■					■		■			■				■	
Wood and furniture industry			■	■						■				■		
Machine and metal industry		■		■				■					■		■	■
Textile industry					■											
Creative industries		■									■				■	■
Pharmaceutics and cosmetics					■						■					
Off-shore technologies											■					
Tourism/health tourism	■	■		■					■	■			■			■
High life quality							■									
Healthy food (agricultural and food sector)	■	■		■	■		■	■	■	■			■	■	■	

1 – Lower Silesian Voivodeship, 2 – Kuyavian-Pomeranian Voivodeship, 3 – Lublin Voivodeship, 4 – Lubusz Voivodeship, 5 – Łódź Voivodeship, 6 – Lesser Poland Voivodeship, 7 – Masovian Voivodeship, 8 – Opole Voivodeship, 9 – Subcarpathian Voivodeship, 10 – Podlaskie Voivodeship, 11 – Pomeranian Voivodeship, 12 – Silesian Voivodeship, 13 – Świętokrzyskie Voivodeship, 14 – Warmian-Masurian Voivodeship, 15 – Greater Poland Voivodeship, 16 – West Pomeranian Voivodeship.
Source: Own compilation on the basis of Dziedzic [2013], Malik [2013], Oborski [2013], Słodowa-Hełpa [2013a], Dziemianowicz et al. [2014].

It is one of the most frequently chosen smart specialisations on a regional level. Most of the voivodeships bases their development on the areas related to nature: bio-economy, health food and health tourism. Yet, there are voivodeships, where it is the traditional industries that will continue to play an important role in regional development (mainly machine and metal industry and energy management). The specific smart specialisations, each chosen by one voivodeship, include: plastic products manufacturing (Kuyavian--Pomeranian Voivodeship), textile industry (Łódź Voivodeship), aeronautics and space exploration (Subcarpathian Voivodeship), tourism – a gate to East (Podlaskie Voivodeship), off-shore technologies[3] (Pomeranian Voivodeship) and water economy (Warmian--Masurian Voivodeship). The specialisations of more general character are chosen by only a few voivodeships (e.g. creative industries, business services, high life quality).

[3]This are predominantly the technologies related to oil and gas extraction from the seabed.

CONCLUSIONS

Smart specialisation, which is an important element of smart growth, is understood as the cooperation between companies, research centres and universities in finding the most promising areas in terms of regional profiles.

The regional research and innovation strategies for smart specialisation and their implementation will play an important role in the upcoming 2014–2020 perspective in terms of increasing the rate of the development of the EU regions. The emphasis on supporting national and regional specialisation should contribute to the improvement in effective UE funds use as well as to the improvements in coordination and synergy between the initiatives undertaken on the European, national and regional levels.

The presented analysis shows that the member states and regions that are willing to apply for support in terms of scientific research, technological development and innovations within the coherence policy have to design their unique strategy for smart specialisation. This also includes Poland and the nation's research and innovation policies. Smart specialisation is not a new agenda in terms of national policy for science and innovation, but its impact and importance will continue to grow in the following years, resulting in scientific analyses and strategic documents, especially on a regional level.

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INTELIGENTNA SPECJALIZACJA – NOWA KONCEPCJA ROZWOJU POLSKICH REGIONÓW

Streszczenie. Artykuł prezentuje koncepcję inteligentnej specjalizacji, nowego mechanizmu pobudzania rozwoju gospodarczego regionów i państw Unii Europejskiej. Celem artykułu jest przedstawienie założeń teoretycznych inteligentnej specjalizacji w kontekście polityki regionalnej. W artykule, wykorzystując krytyczną analizę literatury przedmiotu, omówiono proces tworzenia strategii inteligentnej specjalizacji oraz podjęto próbę identyfikacji obszarów inteligentnej specjalizacji w polskich regionach. Jest to zagadnienie nowe i jednocześnie aktualne, czego wyrazem są liczne w literaturze światowej w ostatnich latach opracowania teoretyczne i empiryczne.

Słowa kluczowe: inteligentna specjalizacja, strategia Europa 2020, rozwój regionalny, polityka regionalna Unii Europejskiej

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