ECONOMICS
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ECONOMIC POTENTIAL OF POLISH AGRICULTURE AND THE POSSIBILITIES OF ITS DEVELOPING IN GLOBALIZATION PERIOD

ABSTRACT. Globalization and the necessity of being competitive induced by the mentioned process causes that the main criterion of economic activities involves rising of functional effectiveness and maximization of profit. The mentioned conditions are referred more and more often to agricultural sector. It results in the increase of the role of effectiveness and competitivity problems in functioning of agricultural farms, also those having a family character. In the discussed situation, the level of economic force of the particular farms and the number of entities, capable of effective competition on the global market has become one of the important questions. Due to this reason, the analysis and evaluation of economic potential of family farms in Poland has been carried out. The possibilities of increasing the competitive capacities of the particular farms and the whole agricultural sector in Poland constitute the important element of the study. In the article, the diverse aspects connected with the above mentioned problems have been presented. In the paper, the Central Statistical Office (CSO) data and those of Eurostat have been utilized. Information of universal statistics has been supplemented with the results of multiannual field studies of IAFE–NRI, conducted on the representative sample of agricultural farms. It was found that although the mutual opening of markets of the EU countries was not an inhibitor of development of economic potential of Polish family farms, the statistical family farms are still characterised by relatively small economic size. The probability of increasing the economic size determines many much differentiated factors. Factors of endogenous nature include such parameters as age of farmer and its skills, scale and structure of investments, complexity of mechanization, and first of all, area of crops.

Introduction

Internalization of farming processes in all-world aspect, i.e. globalization [Hetmań-czyk, Noga 2008] is not a completely new phenomenon[1]. Nevertheless, the contemporary trends connected with the integration of economies have been subject to enormous strengthening. The discussed tendencies are expressed in activation of the exchange of all types of goods and capital, intensifying migration of the population and mainly, in dramatic expansion of trans-national corporations, which determine the boundary conditions for functioning of all spheres of human activity. Besides it, the discussed trends include, principally, all states. Due to this reason, the current globalization processes constitute a phenomenon which differs considerably from a simple economic adaptation in the past and establish the successive stage of development of international economic undertakings [Czyżewski 2003], subordinating them to the microeconomic interest of the global market entities. Moreover, generation of global markets of products, services, capital and knowledge results also in shaping of globalized society [Hetmańczyk, Noga 2008].

The paradigmat of agricultural globalization, identically as of the whole economy, is the abolition of any barriers, inhibiting a free allocation of the factors of production, manufacture and distribution of agricultural products. Nevertheless, the specific conditions of agricultural activities, freedom of allocation in this sector will be determined by natural limitations in mobility of agricultural production process[2] and will be mainly expressed in freedom of acquiring production factors [Sobiecki 2008]. Due to this reason, the most important symptoms of globalization in agriculture will include: liberalization of flows of goods, technologies and labour as well as consumption models [Sobiecki 2007].

Together with the economic development, the role of agriculture in creating value added[3] and in incomes of rural population, the number of families being dependent exclusively on agriculture is decreasing [Sikorska 2006]. Besides it, in the conditions of ongoing globalization process, the microeconomic conditions become more and more important for agricultural producers; only those will remain on the market, who will meet the competition, determined by marginal effective relation of production factors [Czyżewski 2007]. It will lead to principal change of factors, being decisive for the conditions of agricultural production development in a given area.

In spite of all, the mentioned above tendencies cannot mean marginalization of the role of agricultural sector because food has constituted unchangeably the basic consumption need of man. Due to this reason, food security of man in economic and physical aspects has a fundamental meaning for existence of humanity [Sobiecki 2007]. From such viewpoint, food security (of the country, region, e.g. the EU, etc) should be considered in combination with the problems of food self-sufficiency, also in the conditions of globalization, that is, a free flow of agricultural and food products. That's why the commercial-productive function of agriculture remains very significant and imposes strengthening of internal forces, determining the competitive capacities of the discussed sector.

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[1] Researchers of economic history find out the sources of globalization even in remote times when the intensive development of transport to long distances occurred and the possibilities of communicating between the people increased, especially informing about great geographical discoveries in the 15th and 16th century which are currently defined as civilization meetings [Kaliński 2004]. Finally, the opinion is dominating that the discussed trend is connected with the turn of the 19th and 20th c., and the significant development of these tendencies has been univocally related to the recent decades of the last century [Szymański 2001].

[2] The mentioned limitations include, first of all, fertility of silos, aqueous conditions, climate, configuration of agricultural space [Czyżewski 2003].

[3] For example, the participation of Polish agriculture in gross value added in the years 1995–2006 decreased from 8,0 to 4.2 % [GUS 2007].

Globalization is recognized by many people as one of the most progressive forces in the contemporary world [Fukuyana 2000] which brings many profits but also involves significant costs (threats) in social, economic as well as environmental sphere [Szymanski 2007]. The mentioned negative consequences are partially neutralized by regionalization [*Globalizacja … 2005*], not only by protection of interests of the members (sides), creating a given economic bloc but also, due to liquidation of differences, being the obstacle in cooperation, especially improving the market within the frames of party, in consequence of elimination of limitations in free flow of capital, labour and goods [Szymański 2001]. Due to this reason, since the moment of obtaining the membership in the European Union (EU), the whole Polish economy has been subject to a severe verification in respect of competitivity [*Globalobalizaja ....*2005] and the constraint and extent of this verification becomes the fundamental challenge for the particular segments of economic activity, including also agricultural sector.

The Common Agricultural Policy (CAP) constitutes a barrier to covering the agriculture of the EU countries with global processes. Nevertheless, the necessity to make transformations, leading to stable competitiveness of the EU agriculture on the world market, with the decrease of export subsidizing [Czudec 2008] is more and more often discussed. Reaching of the mentioned goal is greatly determined by rise of internal competitiveness via optimization of utilization of production factors and lowering of manufacturing costs. Such task is faced before agricultural farms in each member state, including also Polish farms [Maurel 2005].

In the present situation, quick termination of negotiations on liberalization of the EU market in relation to the non-member states [Michna 2009] seems to be little probable. However, Polish food market is and will remain open towards other EU countries. As compared to other Community countries, Poland has relatively big reserves of agricultural land[4] and due to this reason it has the conditions to become a meaningful agricultural producer. If Polish agriculture is to be competitive, we should possess, first of all, economic entities capable of effective competing on the market of agricultural products [Ziętara 2009]. Such possibilities are dependent, *inter alia*, on the capabilities of the particular agricultural farms to adapt to varying environment [Łuczka-Bakuła 2004] the size of which determines, *inter alia*, the level of their economic potential [Woś 2000].

The aim and methodological aspects of the work

If we take all the mentioned above conditions into consideration, we should recognize that analysis and evaluation of Polish agricultural farms in aspect of the level of their economic size as well as of the possibilities of developing the segment of the entities capable of competing on the market of agricultural products, seems to be purposeful. The mentioned market was and will be affected by global processes.

Economic potential, specified as economic size, may be defined as a reserve of capacities, being found in particular economic entities, facilitating their keeping on the market. It means also the capacities of especially effective functioning in a given sector which may be revealed under the specified conditions or may be affected by a specified factor [Pens 1997]. The mentioned factor determines not only the current situation of a given unit but also creates its future possibilities. Due to this reason, economic size constitutes dynamic category from the micro and macroeconomic viewpoint.

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[4] In 2005, the area of agricultural land (AL) in Poland amounted to ca. 16 mln ha and it was the size comparable to the area of agricultural land in Germany and Great Britain which had 17 mln ha of agricultural land each at their disposal. Considerably greater area of agricultural land, i.e. 30 mln AL each was possessed by France and Spain [GUS 2007].

In case of agricultural farms, economic size means the capacity of the farmer to multiply his property independently and to develop the utilized subject and adapt it to the varying conditions of functioning and maintaining on the market [Woś 2000]. By this, the economic size unit specifies the capacity of a given farm to compete, being defined as capability of economic entities to obtain and then, to preserve and, also, to increase the participation in the market.

According to the above, the economic size is shaped not only by relation of materials factors of production such as land, labour and capital or situation towards outlet and supply markets but also elements difficult to be quantified such as skills and individual features of the persons, employed in agriculture, especially those who play managerial and decisive functions, or – in case of individual agricultural farm[5] – family of the user [Woś 2000]. By this, economic size of family farm is not only varying category but also the non-easy one to be univocally recognised from the microeconomic as well as macroeconomic viewpoint. In connection with this fact, recognition of economic size and, in consequence, of developmental possibilities has the properties of concluding on the ground of different components (values of incomes, scale of production, investing activity, value of assets etc).

In relation to the EU agricultural farms, their economic size[6] is the most universal measure allowing determining and evaluating, relatively synthetically, the economic potential, possessed by the particular entities; it considers the scale of the conducted agricultural activity and relatively wide spectrum of production-cost parameters and local conditions of functioning.

In the EU legislation, there is a lack of general and consolidated specification of the name: agricultural farm; the definition of this unity is subject to changes, depending on the destination of the specified legal acts [Jurewicz 2005]. Such approach causes certain methodological problems as well as obstacles in comparisons within the frames of the Community[7].

Generally, Polish legal system considers the following as agricultural farm: agricultural land together with forest land, buildings or their parts, equipment and inventory items if they constitute or may constitute the organized economic entity and with the rights duties connected with running of agricultural farm.

For the needs of the present work, the subject of the studies in relation to Polish agriculture has been limited to the agricultural farms, being at disposal of physical person (s). Besides it, according to the law on agricultural system of 11 April 2003, the analysed group has been restricted to the entities the area of which amounted to at least 1 ha of AL (agricultural land). The discussed group of the farms constitutes a dominating segment of Polish agriculture[8].

For the needs of the present work, the statistical data collected under the Agricultural Census 2002 and the data of the structural studies, conducted by CSO in 2005 and 2007 in relation to the examined group of agricultural farms, have been utilized.

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[5] In spite of certain differences in the idea, the following names are used as exchangeable in the present study: individual, family, peasant's farm (agriculture). The names: agricultural farm, unit, entity are also used in the same way.

[6] Economic size of agricultural farm is expressed in European Size Unit (ESU) and is a sum of Standard Gross Margins (SGM) of all agricultural activities, conducted in a given a firm. Since 1984, value of 1 ESU has been equal to 1200 EUR.

SGM – is a difference of the mean value of agricultural production from three successive years, as obtained in a given agricultural activity and analogically established direct costs of its production under the manufacturing conditions, being average for a given region.
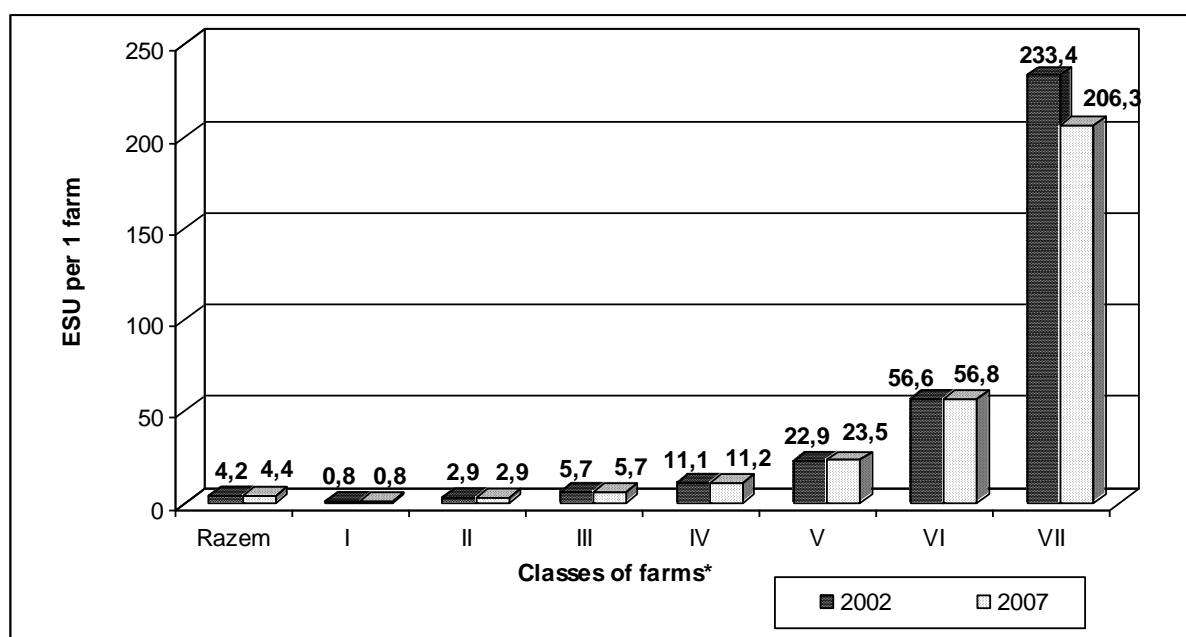
[7] Data from Eurostat are cited in accordance with the national statistics.

[8] They utilize almost 73% of cultivable land in Poland and produce almost 87% of commodity production of Polish agriculture.

Material of common statistics has been supplemented with the results of multiannual field studies, conducted by IAFE – NRI in the years 1992, 1996, 2000 and 2005. The survey covered all agricultural farms with area above 1 ha of AL, being at disposal of physical persons, situated in the same 76 villages from different regions of Poland. The localities were intentionally selected in such a way that the size of the studies farms was proportional to a real area structure. The surveyed units constituted about one five hundredth of the real number of individual farms and their number during the recent study, i.e. in 2005 amounted to 3705 units.

Structure of agricultural family farms according to their economic size

According to GUS data, in 2007 there were 1 804.1 thousand individual farms with the area above 1 ha of AL, including 96.5% units, running agricultural activity. In 2002, the number of the existing units was decreased by 7.6% and at the same time, the number of entities, running agricultural activity was increased by 7.8%. Undertaking of farming by the successive users of farms was, first of all, connected with the expected profits which resulted from the entrance to the EU and covering of Polish agriculture with the CAP. In 2002 – 2005, the number of agricultural activity-running farms was increased by 5.5% i.e. by more than 1.8% per year in average, whereas in the in the period of 2005 – 2007, the mean annual rate of growth of agriculturally active units was equal to 1.1%. The mentioned changes were accompanied by the increase of economic size (Fig.1) and transformations in the structure of individual agricultural farms according to the mentioned criterion (Tab.1).

The following designates were used of individual classes of farms' economical value I - up to 2 ESU; II - 2 to 4 ESU; III - 4 to 8 ESU; IV - 8 to 16 ESU; V - 16 to 40 ESU; VI - 40 to 100 ESU; VII - 100 and more ESU.

Figure 1. Changes in average economic size of agricultural family farm
Source: prepared on the basis of unpublished Central Statistical Office data.

During the years 2002 – 2007, the mean economic size of family farm was increased from 4.2 to 4.4 ESU, i.e. by 4.8%. In spite of the mentioned positive changes, the economic potential of Polish agricultural farms is relatively low. To compare, the mean economic size of agricultural farms in the EU in 2005 amounted to 10.5 ESU. It was almost 2.5-times higher

than the mean economic size of agricultural unit in Poland which constituted 4.3 ESU in that time.

From analysis of distribution of farms according to their economic size, it results that the discussed group consisted of the unit with much differentiated economic size and there was a stable domination of very small farms which, from the economic viewpoint, should be considered as non-vital (up to 4 ESU). Additionally, in the years 2002–2007, the 9.9% increase in the number of the farms with the mentioned size was recorded; their participation was increased from 72.3 to 73.7%, i.e. by 1.4 percent points. The mentioned changed were mainly a consequence of the increase of the number of farms up to 2 ESU, that is, minimum threshold of economic potential, specified in the studies for Polish commercial farms in respect of the group of the discussed size. During the analysed period, the increase of the number of the entities of the mentioned size was by 5.5-times increased as compared to the farms with economic size from 2 to 4 ESU. During the mentioned period, the rate of growth of the number of units up to 2 ESU was not only higher as compared to the units with a size of 2–4 ESU (11% vs. 6.4%) but it was also quicker than the average one for the whole discussed population (7.8%). In consequence, the participation of the farms with the lowest economic size was increased by 1.6 percentage points (from 55.1 to 56.7%), with the unchanged average value of total SMG which was equal to 0.8 ESU in both compared years.

Considerably higher increase of the numeric status was visible in the group of the farms with a relatively high economic potential, the size of which constitutes a guarantee of preserving a durable competitivity, that is, size of 16 and more ESU [Józwiak, Mirkowska 2008]. In total, the number of units in the discussed group was increased by 38.4%. The mentioned trend was even higher in the units with SGM from 40 to 100 ESU and it amounted to 63.1%. In the examined period, the group of farms with economic size of 8–16 ESU was also increased (by 0.8%). In spite of the fact that the increase, in this case, was almost 10-times lower than the mean for the whole discussed population, it should be added that it concerned the population with economic size equalling at least to 8 ESU, i.e. minimum economic potential, enabling competing on the EU market [Józwiak, Mirkowska, 2007, 2008].

Table 1. Changes in number and structure of individuals farms

Specification	Year	Total	Economic size classes						
			to 2	2-4	4-8	8-16	16-40	40-100	100 and more
			in ESU						
Number of farms, running agricultural activity (*in thous*)	2002	1615.0	889.5	278.0	235.5	143.5	58.1	8.4	2.0
	2007	1741.6	987.7	295.7	218.7	144.7	78.6	13.7	2.5
Structure of farms	2002	100.0	55.1	17.2	14.6	8.9	3.6	0.5	0.1
	2007	100.0	56.7	17.0	12.6	8.3	4.5	0.8	0.1
Changes in the years 2002 –2007 (*in thous*)		+126.6	+98.2	+17.7	-16.8	+1.2	+20.5	+5.3	+1.5
Rate of changes (%)		+7,8	+11.0	+6.4	- 7.1	+0.8	+35.3	+63.1	+25.0
Mean annual rate of changes (%)		+1.6	+ 2.2	+1.3	- 1.4	+0.2	+7.1	+12.6	+5.0

Source: prepared on the basis of unpublished Central Statistical Office data.

In consequence, in 2007 there were only 13.7% of family farms; it was somewhat higher than in 2002 (13.1%). At the same time, the competitive capacities of the discussed group were increased, what was confirmed by the changes in economic size. As compared to 2002, it increased by 9.3% when it was 18.2 ESU; and in 2007 it constituted 19.9 ESU in average.

The scale of occurrence of the farms having a small economic size was also confirmed by the fact that if we exclude the units which do not exceed 2 ESU, the mean size of the total GSM will be equal to 9.1 ESU. It does not change the fact that it is relatively small even in such situation and differs from the economic size of the farms of the EU countries, with whom our farmers, as a rule, compete for the markets[9]. Besides it, it was only by 14% higher than the threshold of economic size (8 ESU) adopted for commercial farms in 1/3 of the EU farms[10] and simultaneously, it was by 43% lower than the minimum limit for the commercial farm in Great Britain, Belgium and Holland.

Macroregional differentiation of economic potential of family farms

Macroregional differentiation of agricultural structures in Poland in respect of their development is their persistent feature. The currently recorded spatial diversities in this respect have their aetiology in geographic–natural as well as cultural, historical, and, first of all, socio-economic conditions.

Table 2. Economic size of individual farms in macroregions in 2007

Macroregions*	Percentage		Mean economic size of farms		
				above	
	Up to 2.0	Above 8.0	total	2.0	8.0
	ESU			ESU	
Poland	56.7	13.7	4.4	9.1	19.9
Central- western	35.0	32.6	8.9	13.2	22.0
Central-eastern	50.2	14.1	4.3	7.8	17.4
South-eastern	76.4	3.3	2.0	5.6	17.5
South-western	59.9	13.7	4.8	10.8	23.7
Northern	41.2	26.0	7.6	12.4	22.4

*The particular macroregions include the following voivodeships: (**I**) **central- western** – wielkopolskie and kujawskie; **central-eastern (II**) – łódzkie, mazowieckie, podlaskie and lubelskie; **south-eastern(III**) – śląskie, małopolskie, świętokrzyskie and podkarpackie; **south-western(IV**) – opolskie, dolnośląskie and lubuskie; **northern (V**) – zachodniopomorskie, pomorskie and warmińsko-mazurskie.
Source: prepared on the basis of unpublished Central Statistical Office data.

At the same time, we should stress relatively high economic size of the farms being found at the territory of the northern macroregion. The farms, situated at the discussed place were by 73% stronger as compared to the mean for the country but simultaneously, they were by 17% weaker than the farms from the central-western macroregion. Besides it, 26% at the
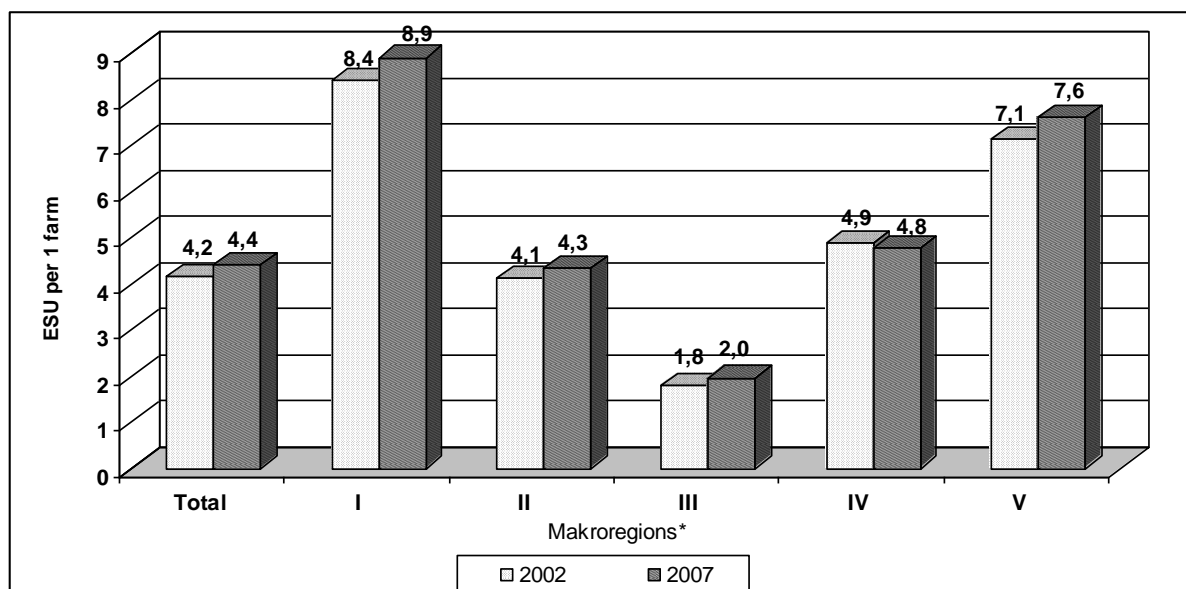
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[9] To compare, the mean economic size of agricultural farm where the total SGM exceeded 1 ESU, i.e. lower threshold(defining a farm as a commercial one for FADN studies) was equal to 19.1 ESU in the EU in 2005 and amounted from 3.8 ESU in Lithuania and 5.2 ESU in Latvia to 68.1 ESU in Belgium, 70.3 ESU in Denmark and 102.6 ESU in Holland [*Charakterystyka ... .2008*].

[10] The mentioned countries include Austria, Denmark, Finland, France, Luxembourg, Malta, Germany, Sweden and Ireland.

discussed territory included the units, producing at least 8 ESU of total SGM and 41% were constituted by the entities up to 2 ESU.

Differentiation of agricultural structures is reflected, *inter alia*, in spatial differences in economic size of the farms; the domination of small and very small units was, however, recorded in all macroregions (Tab.2). The central-western macroregion was characterized by the most favourable situation in respect of economic size of family agriculture. In 2007, the mean size of individual farms situated in the mentioned above region was equal to 8.9 ESU and it was value more than twice higher as compared to the mean for the country. At the same time, there was relatively low number of the entities up to 2 ESU in the discussed territory (35%). Besides it, only at the discussed territory, the size of the mentioned group was approximate to the number of units with the total SGM equal to 8 and more ESU; their participation amounted to 33%.

On the contrary end, there is individual farming in the south-eastern macroregion. The mean economic size in the mentioned territory amounted to 2.0 ESU and it was by 55% lower than in the whole discussed group. Simultaneously, only 3% of the entities possessed economic size enabling competition and it was the scale by 25-times lower than the participation of non-commercial farms and constituted as much as 76%.

Explanations are the same as in. tab.2.

Figure 2. Spatial differentiation of the rate of growth of the mean economic size of individual farms in the years 2002–2007
Source: prepared on the basis of unpublished Central Statistical Office data.

Territorial differentiation in economic size of family farms has a permanent character. Similar situation concerned the rate of changes in this respect and the increase of economic potential was a dominating tendency (Fig.2). Small decrease of total SGM of statistical farm, reaching to 2% (from 4.9 to 4.8 ESU) was found at the territory of the south-western macroregion. In all remaining macroregions, the increase of economic size was recorded and the scale of the mentioned increase was as follows: from almost 5% (from 4.1 to 4.3 ESU) in the central-eastern macroregion to 11% (from 1.8 to 2.0 ESU) in the south-eastern macroregion).

It should be, however, mentioned that in the analysed period, the highest rate of growth of economic size of family farms in the scale of the country was recorded in the south-

eastern macroregion but their economic size was constantly the lowest one in the scale of the country. On the other hand, the interregional disproportions in this respect were decreased. In 2002, the ratio between the region, characterized by the lowest (south-eastern macroregion) and the highest (central-western macroregion) economic size of economic farms was equal to 1:4.7 and in 2007, it amounted to 1:4.5. The cited relations may, inter alia, indicate the commencement of the reduction of territorial differences in economic size of family farms.

Economic size and competitive level of incomes from work in agricultural family farm

The competitive capacity of farms is first of all reflected in the incomes because their level informs about the situation of the particular entities. The level of the reached agricultural incomes is an evidence not only of the living standard of agricultural producers but also on marketing capacities and possibilities of financing the investments from their own means.

In case of family farms, it is assumed that those units are capable of effective competing, which reach the level of income from agricultural activity, which allows the independent reconstructing of production property and remuneration of own labour of the farmers at least on the parity level [Józwiak, Mirkowska 2007]. On the ground of the work, carried out with the utilization of data from the field studies, it was found that those conditions were met by those farms where the agricultural income, calculated per one full-time employed person was at least equal to mean incomes in non-agricultural activity; those farms were called highly commercial farms. Minimum economic size of the units, satisfying the mentioned criterion amounted to 8 ESU and the scale of their agricultural commercial production was at least twice higher as compared to all farms, producing for the market [11] [Karwat-Woźniak 2008b].

From the conducted analysis on the ground of survey data, it results that not all entities with the economic size of at least 8 ESU have reached the specified below minimum level of agricultural income. The mentioned condition was not satisfied, as a rule, by each tenth farm with the economic size of at least 8 ESU. In 2005, for example, the entities where the employed members of agricultural family obtained the incomes exceeding the mean earnings from work in non-agricultural sectors, constituted 11% of all individual farms and 12% of all farms, running the agricultural activity.

From the conducted work, it is followed that in the conditions of intensifying competition, meeting the requirements and obtaining the satisfying incomes from work in family farm, was, as a rule, connected with the necessity of increasing the economic potential of the utilized farm [Karwat-Woźniak 2008a]; although the lower limit of total SMG of a given entity, enabling effective functioning was equal constantly to 8 ESU [Karwat-Woźniak 2008b], the participation of the entities from 8 to 16 ESU among the highly commercial farms was systematically decreasing. In the years 2000- 2005, the participation of the units of the mentioned size was decreased from 65.5 to 55.9%. At the same time, the increase of the percentage of the entities with relatively high economic size had place.

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[11] In 2005, for example, so specified scale of sales was at least equal to 17.4 thousand euro.
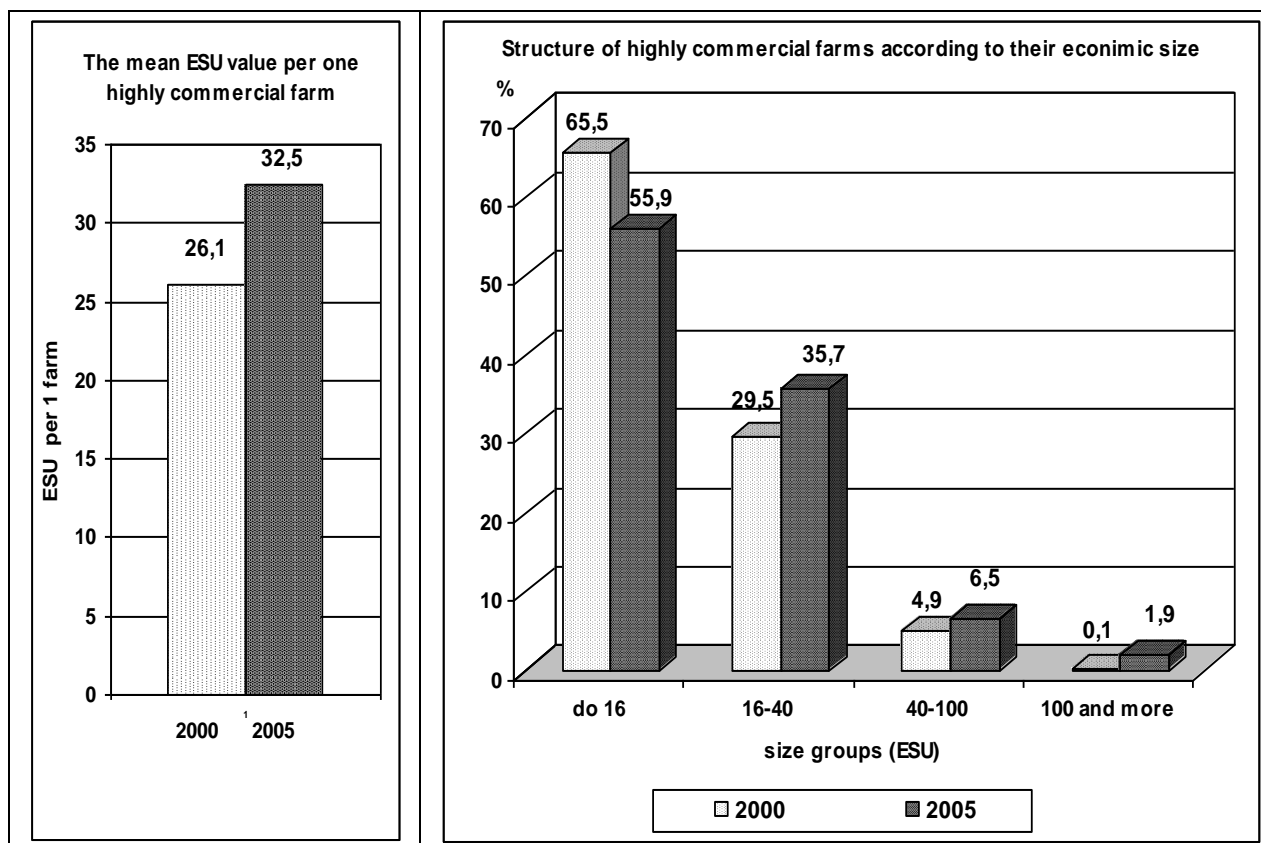
Figure 3. Highly commercial farms according to their economic size
Source: Prepared on the basis of IAFE-NRI 2005 survey data.

During the discussed time, the participation of highly commercial farms with total SMG above 16 ESU was increased from 34.5 to 44.9%. If we consider the group of the entities with the economic size equal to 100 ESU and more, the dynamics of the discussed process has been stronger. In 2005, total SMG amounted to at least 100 ESU in 1.9% of highly commercial units whereas in 2000, there was only 0.1%. In consequence, the mean economic size of highly commercial family farm in 2005 amounted to 32.5 ESU and it was by 6.4 ESU higher (by 24.5%) as compared to 2002.

Effect of the selected factors on the increase of competitive capacities of highly commercial family farms

The effective development of competitive capacities of agricultural sector in Poland is connected, *inter alia*, with the increase of the group of highly commercial family farms. At present, highly commercial sector in individual agriculture includes ca. 220 thousand entities; the mentioned group utilizes 38% of agricultural land, 55% of farm animal population, 40% of technical fixed assets; they deliver almost 62% of commercial production value of individual agriculture. It has been commonly adopted that to ensure the competitivity of Polish agricultural sector and its sustainable development as well as food security, and in the future, also energetic safety of the country, the numerical size of the group of highly commercial farms should be composed of at least 300 − 350 thousand units and it should utilize at least a half of agricultural land and produce 80% of the agricultural production sold. In the above context, activation of the processes of developing the mentioned category of farms becomes the important issue.

In general, the requirements which determine the essence, direction and rate of changes occurring in the particular entities of agricultural sector may be classified into two groups, i.e. external (exogenous) and internal (endogenous) forces and developmental limitations. The first one is constituted by all conditions, determining the environment of agricultural production units, i.e. the whole system of agri-business and economic, agricultural and trade policy of the country and also, the circumstances resulting from the European integration and the CAP and globalization processes [Kowalski, Rembisz 2005]. The second group is created by the conditions, resulting from socio-demographic properties, of the persons who are the managers of agricultural activity and the members of their families and the economic specificities of the utilized farms. The mentioned factors determine mainly the productive potential of agricultural entities which – in a given situation – determines their competitive capacities (position on the market). Besides it, they create the area which is greatly dependent on the farmers and due to this reason, constitutes the main platform for the studies.

The analysis of the effect of factors, specifying production potential, on competitive domination of the highly commercial farm required a measure of the market position of the farm to be specified. The availability of empirical data allowed differentiating the units in respect of the reached appropriate level of sales (commercial production). The basic endogenous (dependent) variable was, therefore, the level (value) of commercial production, obtained by the farm in a given year. The meaningful differentiation of the size of the group of highly commercial farms in respect of the number as well as lack of the continuous observations in the particular units has caused the necessity of conducting the data analysis in static approach, excluding simultaneously the possibility of performing the incremental studies i.e. taking into consideration the effect of dynamics of the analysed factors on the endogenous variable. Due to this reason, the separate models for each year (4 years of analysis – 1992, 1996, 2000 and 2005) were calculated. Such approach allowed identifying the varying factors, differentiating the level of commercial production of the farm throughout the period of thirteen years.

On the ground of literature query and professional knowledge and possessed empirical materials from field studies, there was established a group of factors in relation to which the assumption on their potential reason-result relation with the dependent variable (scale of commercial production)[12] was adopted. The selected sets of factors included: quality of human capital, furnishing with fixed reserves, market relations, investment activity, the scale of utilizing credits and financial support within the frames of the CAP.

The starting point for evaluation of the effect of the particular factors on market position included the choice of functional form of evaluating the econometric model[13].

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[12] It meant the level of sales in thous. PLN per one farm and optionally, as calculated into 1 ha of AL and per one employed mainly in the farm. It allowed creating dependent (endogenous) variable adopting four values in the increasing order.

[13] More details on all requirements and the employed research method is found in [Karwat-Woźniak, Gospodarowicz 2009].

Table 3. Effect of exogenous (independent) variables on the level of commercial production of farms in the particular years of analysis

Independent variables	Type* and level of relation (in %) with dependent variable			
	1992	1996	2000	2005
length of management (manager at production age)	+10	0	0	+2
level of education	0	0	+2	+5
fact of possessing agricultural education	0	0	-53	0
area of cultivated land (ha)	+4	+4	+3	+3
size of basic herd (DJP)	+1	0	0	+2
number of machines	0	0	-6	-2
full mechanization of production processes	0	0	0	+241
technical state of buildings	0	0	0	-40
full mechanization of work in farm buildings	0	0	+2	+10
purchase of land	0	+3	0	+1
investments in buildings	+7	+4	+2	+1
purchase of machines	+10	+2	0	+1
investment credits	0	0	0	-1
current credits	0	0	+3	0
constant receiver of production	-20	0	0	+20

Mark (+) means positive effect of a given property on a chance of passing of a farm to higher category (higher production level, i.e. quartile) and (-) means the increase of a chance of decline to lower category
Source: developed on the ground of data from IAFE-NRI survey 1992, 1996, 2000 and 2005.

Due to the characteristics of dependent variable, the method of ordered/ordinal logit [Hosmer, Lemeshow 2004] was chosen. The models were estimated separately for each year and each dependent variable. In total, several tens of models, differing in the set of the selected exogenous variables were subject to estimation[14].

From the developed models and performed calculations, it is followed that the effect of characteristics of the farm on the level of its commercial production revealed a significant variation during four successive periods of analysis (Tab.3). The only one feature which preserved statistical significance and appropriate direction of dependence in the years 1992, 1996, 200 and 2005 was the size of agricultural land. In the light of the submitted results of the studies, there was found a positive relationship of the mentioned characteristics of the farm with its level of the commercial production. Besides it, the features, illustrating the investment activity of the farm had also the positive effect on the level of the farm's production. On the other hand, the effect of the remaining analysed factors on the dependent

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[14] The basis for selection of independent (exogenous) variables for a given model was constituted by the adopted research hypothesis. The second criterion includes the relationship of exogenous (independent) variable and the endogenous (dependent) variable. The exogenous variables should be dependent on endogenous (dependent) variable and be simultaneously mutually independent. In case of the analysed mode, the relation between the variables was tested, using independence test X^2 (with variables, having a qualitative character) and correlation analysis. In all cases, the hypothesis on independence of exogenous and endogenous variables was rejected. In order to exclude the co-linearity of qualitative variables, the variance inflation factor (VIF) was also examined.

(endogenous) variable, i.e. scale of the commercial production, was difficult to be univocally interpreted due to the observed variability.

Summing up and conclusions

The submitted analysis showed that the mutual opening of the market of the EU countries has not been the inhibitor for development of economic potential of Polish family farms. In the years 2002–2007, the mean economic size of family farm was increased by 4.8% (fro, 4.2 to 4.4 ESU). However, in spite of the mentioned positive transformations, statistical family farms are still characterized by relatively low economic size. Beside it, the group of very mall and small farms occurred to be relatively numerous (almost 73%) considered as non-vital from the market point of view.

Agricultural family farms perform the maximum multi-aspect function and the problems of effectiveness of functioning and competitivity have not always had a primary meaning [Woś 2000]. It does not change the fact that from the viewpoint of obtaining satisfying incomes from employment in agricultural activity and of the intensifying competition, aspects of effective farming have become more and more important what is connected with the processes of production and production means' concentration. The mentioned tendencies cause the necessity of increasing the economic potential to the level which gives a chance of existing on the agricultural market which is more and more affected by the global factors.

The ability of acquiring and preserving a strong position on the agricultural market under the conditions of free access and simultaneously, reaching the level of agricultural income which allows paying for employment in agricultural sector at least on the parity level has been obtained by the constantly increasing group of agricultural, i.e. highly commercial individual farms. In the years 1992–2005, the size of the discussed group was increased by almost 60%; it constitutes 12% of all individual farms with above 1 ha of AL in Poland. The manufacturing potential of the discussed group was meaningful; it was in particular illustrated by the size of the manufactured commercial production which constituted ca. 2/3 of the sales value of agricultural products. From the viewpoint of food and energy security of the country, the group of the highly commercial units is too small and first of all, it has a small production potential at its disposal. Development of the discussed group has also gets the importance from the viewpoint of competitivity of agricultural sector. Due to this reason, it is necessary to seek for factors which would stimulate increase of potential and competitive capacities of agricultural farms.

From the conducted analysis of endogenous factors which determine economic potential and from evaluation of their effect (using hierarchic logit method) it is followed that the probability of further development is determined by many much differentiated features. The mentioned features include, *inter alia*, the age of manager and his skills, scale and structure of investments, complexity of mechanization and the area of the farm. The set of the factors which stimulate developmental processes and their effect was different in the particular studied period. Irrespectively of the general economic conditions, which play a special role in evolution of the entities, producing agricultural raw materials, the mentioned properties have always occurred in case of the farm's area and the increase of the area of cultivated land by 1 ha of AL increased the chance for increase of the commercial production scale by 3-4%.

The rate of transformations in the years 2000–2005 clearly indicates the favourable effect of integration processes and of the CAP on shaping of highly commercial segment in agriculture. Farming conditions are varying nowadays and the costs are dynamically increasing. Simultaneously, economic recession causes that the conditions for functioning

become more and more difficult. Under such situation, further development of the discussed group should be related to the activation of the measures, enabling the increase of the arte of adaptation of production offer to effective demand and the increase of the activity, which improves effectiveness of farming.

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