Food economy and rural areas in Poland – structural changes and effectiveness of public policy

INSTITUTE OF AGRICULTURAL
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Food economy and rural areas in Poland – structural changes and effectiveness of public policy

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COMPETITIVENESS OF THE POLISH FOOD ECONOMY UNDER THE CONDITIONS OF GLOBALIZATION AND EUROPEAN INTEGRATION

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This publication was prepared within the IAFE-NRI Multi-Annual Program 2011-2014 "Competitiveness of the Polish food economy in the conditions of globalization and European integration", as a contribution to the research on the following subject: **Analysis of the effects of selected instruments of Common Agricultural Policy and Rural Development Policy** within the framework of the research task: *Variant analysis of the impact of CAP instruments on the changes in agriculture and rural areas*.

The extent and type of instruments of the agricultural and structural policy of the European Union result from the postulate of an active role of government in the process of eliminating inefficiencies of market mechanisms within the concept of market failure. This concept suggests that in the realities of the market economy, the structure and size of supply is not reflected in adequate level of demand, as a result of the lack of autonomous re-balancing mechanisms. In practice, the processes of allocation of goods and services, despite the assumption of conditions of perfect competition and complete information as attributes of a complete market, show a number of disagreements. In accordance with some economists, intervention instruments have rather short-term effects at the macro level. In their opinion, if public funds do not reach the most efficient entities, the market in the long run will make corrections and efficiently allocate resources. Socio-economic transformations that took place in Poland in the period of EU membership caused a number of structural changes in the resources and distribution of production factors in agriculture. The main objective of the study is to analyse the some theoretical aspects concerning the concept of market failure and rationale for government intervention in the context of structural changes in agro-food sector and rural areas in Poland. The presented material includes analysis and assessment of CAP instruments influencing the production decisions of farmers, aspects of effectiveness and efficiency of EU financial support in regional development. In the last chapter the authors present conclusions related to the structural changes in agro-food sector, market imperfection and agricultural policy.

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1. Introduction

Poland's membership in the EU has radically changed the economic conditions of functioning in the Polish agriculture and rural areas. The most important sources of these changes, are of course, apart from the European Single Market and macroeconomic conditions, Common Agricultural Policy (CAP) and structural funds. Today, we already know that CAP has actually caused an increase in support for agriculture, while structural funds have triggered considerable cash flows intended for modernisation of food economy and rural areas development.

The global experiences prove that the market and the state have to co-exist and the state intervention should be always limited to support market mechanism and not replacement thereof. The state should interfere only when it has a clear advantage over the market mechanism; hence only when the market fails to protect the general interests of the society [Woś 1995]. The contemporary global economy often rejects the thesis on the perfect market [Czyżewski 2007, p. 24 and the following pages] thereby justifying the role of state intervention. When explaining the main reasons for intervention in the modern global agriculture J.E. Stiglitz [1987, p. 52] and J. Wilkin [2003, p. 27 and the following pages] point to the high level of risk linked to agricultural activity and lack of effectiveness in prevention of this risk. The risk results from e.g. changing climate conditions, lack of sufficient information and underdevelopment of agribusiness structures, including also consultancy. The need for interventions in the agribusiness sector is justified also by: the phenomena of external costs and effects, low price elasticity of supply, lower level of labour productivity than in other sectors of the national economy, low mobility of the workforce employed in agriculture, the need to provide public goods, implementation of the sustainable development concept. So far the CAP has been one of the most important pillars of European integration, in determining the functioning of the food sector and rural areas in Europe, and will remain in this role also to at least 2020.

As a result in the last decade the structural changes taking place in the Polish agriculture, food industry and rural areas became more dynamic. The most important among them cover: a drop in the number of farms with simultaneous growth in the share of the largest farms, which directly influences the increase in the average area of farms, drop in employment in agriculture and progressing production concentration and specialisation [Kowalski, Wigier, Bułkowska 2014]. The structural changes are, however, slow and cannot be efficiently accelerated due to non-agricultural circumstances. The Polish agriculture is still characterised by

a strong polarization of the agrarian structure. A group of market holdings emerged, which are strong economically and able to compete within the EU. Market orientation of agricultural producers increased. The progressive depreciation of fixed assets of agricultural holdings is a major problem [Woś 2003].

The rural areas are not only agriculture. Their importance in the economic system is much wider. A large part of the rural population is not currently employed in the agriculture. In addition, as a result of investments, labour productivity in the agricultural sector is increasing. Consequently, there is a systematic increase in the labour force in the rural areas, which should be managed by the non-agricultural sectors of the economy. However, fairly limited mobility of the rural population, is not conducive as it comes to the full use of these resources in urban areas. Therefore, entrepreneurship of rural population is an important issue, which leads to the development of non-agricultural sectors of the economy in rural areas, reducing thereby the negative effects of limited mobility. The development of non-agricultural activities in rural areas faces, however, barriers related to their specificity. The low income of the rural population reduces the possibility of the involvement of own capital and raising borrowed capital. Moreover, broadly understood state of infrastructure and the level of knowledge of the rural population can also be a barrier to the development [Kulawik 1999]. On the other hand, the development in the area of production techniques and technology as well as information transfer can promote establishment of economic activity in the rural areas, eliminating advantages of the urban areas resulting from e.g. the benefits of agglomeration.

The role of development of non-agricultural activities in the rural areas as well as existing barriers and drivers of this development have caused that the issue has become a subject of interest, and also the influence of different policies. One example is the policy of the European Union, which, through the use of various instruments, both in the context of regional and structural policy, seeks to promote the development of non-agricultural sectors of the economy. The support of the public sector to the private sector constitutes, however, the state's interference in the functioning of the market. Evaluation of such activities is unclear in the economic literature. On the one hand, it depends on the form of the support, on the other hand on the applied theoretical and methodical approaches.

The CAP constitutes an example of state intervention in the food sector and in rural areas, which among its instruments has market-based instruments (referring to supply and demand regulation) and non-market instruments (direct and indirect grants). The market-based instruments, related to price support, favour the biggest producers, in particular the most productive ones and producers of goods. Thus they fail to meet the criterion of fairness and providing support to the weaker as the

reason for intervention [Rembisz 2010, p. 10]. The rural development programmes are an example of non-market instruments. As the instrument of state intervention policy they provide a possibility to stabilise the policy in several production cycles. They stimulate changes as regards the production structures, competitiveness improvement, environmental protection and multi-functional development of rural areas. Thus they constitute the basic instrument supporting the process of food economy and rural areas modernisation.

The integration with the EU created new conditions in Poland for the development of agriculture, food industry and rural development. Since 2002 the food economy and rural areas have been supported with the resources of programmes co-financed from the EU budget that penetrated and complemented each other. The total value of financial aid programmes (together with direct payments) for the agri-food sector and rural areas from the beginning of 2002 until the end of June 2014 exceeded PLN 170 billion[1]. This includes SAPARD[2] payments – ca. PLN 4.5 billion[3], SOP "Agriculture"[4] – ca. PLN 6.4 billion, RDP[5] 2004-2006 – ca. PLN 11.1 billion[6], RDP 2007-2013 – PLN 56.3 billion[7] and almost PLN 81.7 billion from direct payments. The SAPARD programme aimed at preparing the Polish agri-food sector to the accession, especially as regards the adjustments to the sanitary, hygienic and environmental protection requirements of the EU. After 2004 the strategic objectives of the agricultural policy cover: competitiveness improvement of the agri-food sector, sustainable development of rural areas, improvement of the state of the natural environment, improvement of the quality of life and diversification of the economy on rural areas.

The ongoing debate on the EU forum concerning the CAP until 2020 indicates that this policy will play a key role in ensuring food security, sustainable development of agriculture and rural areas, as well as natural resources management. It will be an effective instrument focused on new Community challenges, for instance, those related to: resources protection, climate change, water resources management, biodiversity, renewable energy as well as risk and crisis management.

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[1] All financial information concerning the implementation of programs financed by the EU are derived from monitoring data of the Agency for Restructuring and Modernisation of Agriculture, www.armir.gov.pl; 1 EUR = 4 PLN.
[2] Special Accession Programme for Agriculture and Rural Development – SAPARD.
[3] The amount covers PLN 468 million of payments financed from the RDP 2004-2006.
[4] Sectoral Operational Program "Restructuring and Modernisation of the Food Sector and Rural Development 2004-2006".
[5] Rural Development Plan.
[6] The amount does not cover payments from the SAPARD commitments and the payments of commitments moved to be financed from RDP 2007-2013.
[7] Together with the commitments of the RDP 2004-2006 – ca. PLN 9.2 billion.

In the future the food security remains a key challenge for the food sector, not only in the EU but around the world.

Therefore, one of the objective of the research conducted in 2011-2014 under the Multi-Annual Programme "Competitiveness of the Polish food economy in the conditions of globalization and European integration" was to assess the effectiveness of selected CAP instruments influencing the production decisions, structural changes in agro-food sectors, and entrepreneurship development in the rural areas. The publication deals also with the issues of development and the role of public policy in the agro-food sector illustrated with the Polish experience in the period after the accession to the EU. With regard to the theoretical foundations of classical economics, the authors present the issues of public policy role, provide an analyses of the current situation in agriculture and food industry, the characteristics of public assistance programmes for the agricultural and food industry, evaluate the development and chances of achieving long-term goals of agriculture and rural areas development based on the new CAP instruments for the period until 2020.

The subjects of this publication are the issues of structural changes in agro-food sector in Poland, the influence of the public policy on production decision of farmers and effectiveness and efficiency of regional policy in economic development. After short introduction, presented in Chapter One, the authors present the results of the research. In Chapter Two they present some information concerning methodology of the study. The research was based on: data analysis of public statistics for 2002-2013 concerning the structural changes in the economy, agriculture and in agri-food industry, data analysis from the Local Data Bank for 1,529 rural counties in 2004-2013, analysis of the FADN data on farms in 2004-2012, and data analysis from the IAFE-NRI survey, "Family and Its Holding" carried out in 2011. The study used a descriptive analysis method, as well as statistical analysis tools, such as: econometric model of β-convergence, adapted to the level of a county, the Gini coefficients used to determine the level of diversity of objects in the population in terms of specific characteristics.

With regard to the theoretical foundations of classical economics, Chapter Three presents the issues of public policy instruments, their role in economic development and in structural changes, market failures and rationale for government intervention, asymmetries in access to market information, the issues of regional policy and the support of the business activity development in rural areas, as well as the issue of evaluation criteria of effectiveness and efficiency policy instruments.

Chapter Four provides an analysis of macroeconomic factors affecting the functioning of the food economy in Poland. It refers mainly to the factors such as GDP, investments, inflation, unemployment rate, foreign trade. Later in this chapter

the authors analyse the structural changes in Polish agriculture, e.g.: change in the number of agricultural holdings, area of agricultural land, agricultural production, index of price scissors and variability in production, agricultural income, source of aid for farms. In the field of the food industry there were presented, among others: structural changes, value of production, financial situation, value of investments, support of investment with public funds from the EU budget, role of transnational corporations in the functioning of food markets and the processes of globalisation and European integration.

The next chapter – Chapter Five contains analysis and assessment of CAP instruments influencing the production decisions of farmers. These studies were based on the FADN data. Presented outcome of the research relates to changes in agricultural holdings income, the level of operating subsidies, the value and structure of agricultural production. In Chapter Six the changes in Polish agriculture and the CAP in the opinion of farmers are shown. The data comes from the IAFE-NRI survey, "Family and Its Holding", carried out in 2011. The analyses cover changes in structure of production, the use of the means of production, single area payments and complementary area payments, CAP impact on the stabilisation of agricultural markets and farmers' incomes.

Chapter Seven examines the problems of effectiveness and efficiency of EU financial support in regional development and convergence at the local level. Presented analyses relate to problems of support for the development of entrepreneurship in rural counties in 2004-2011, advantages of high-income communities in terms of economic development, coefficients of variation of own income of counties, coefficients of own income diversification in rural counties in 2004-2011, the Gini indices for own income per inhabitant of working age in rural counties. The authors present the results of the regression analysis for the absolute beta convergence for own income per inhabitant of working age by groups differing in terms of the use of EU funds under operational programmes involving support the development of entrepreneurship, and rate of absolute convergence of type β and the period of halving the difference in own income. The study also raises the efficiency problem of financial support at the local level through the analysis of the structure of financial transfers from the EU budget to the different group of rural counties, analysis of the number of private economic entities, numbers of micro-enterprises per 1 thousand of working-age individuals, average annual growth rate of the number of economic entities, number of new private economic entities, analysis of increase in the absolute number of micro-enterprises, average annual growth rate of the number of micro-enterprises, share of the employees in the total number of working-age population, changes in the share of the employees, increase in the average level of

municipal real property tax and personal income tax revenues per capita of working--age population, increase in municipal real property tax and personal income tax revenues and amounts of support from the EU budget.

Chapter Eight is a summary of considerations regarding the above-mentioned issues. The entire publication ends with a comprehensive list of references.

We believe, that this publication will answer to, at least some questions on the effectiveness of public policies and the competitiveness of the agri-food sector. However, we are aware that we failed to provide answers to each and every question related to the publication title. The authors know that despite the extensiveness of the study, we have not exhausted the lists of questions related to the analysed issue. Thus we will have the possibility to continue this serious discussion. It will be continued at the platform of seminars and scientific conferences organised by the Institute, as well as in a publishing series of multi-annual programme.

2. Methodology

The studies on food economy and rural areas in Poland – structural changes and effectiveness of public policy were focused primarily on the structural changes in agro-food sector, CAP policy instruments influencing directly or indirectly those changes, supporting the production decisions of farmers and the development of non--agricultural activities in the rural areas, which is a result of formation of entrepreneurial attitudes of the population. Application of purposeful approach in such cases helped to assess the effectiveness of policies pursued by the EU. The multi-criteria approach enabled to assess the objectives of CAP and determine the theoretical terms of the stability of the achieved results. The starting point of this study was the identification of the instruments that could be used in the framework of the abovementioned policies to support the farmers' decisions and development of economic activities. A wide range of instruments and the relation between them, as well as the diversity of used research methods allowed to make a comprehensive and objective evaluation.

In the first part the study aims, in particular, at demonstrating the impact of the Common Agricultural Policy (CAP) on changes in the Polish agricultural sector, i.e. on farmers' decisions, and assessing the stability of these changes. To achieve this objective, both Polish FADN data of 2004-2009 and 2004-2012, as well as data from the IAFE-NRI survey, "Family and Its Holding", carried out in 2011 were analysed. The survey provided information on the CAP impact on the production decisions of farmers. The analysis and development of the results of the survey, "Family and Its Holding", were carried out using descriptive statistical methods.

The FADN data were analysed in two phases, which was associated with the availability of data and changes in FADN classifications and methodology. First, the analysis covered 2004-2009. The analysed period was divided into sub-periods: 2004--2006 and 2007-2009, for which mean values of variables used in the analysis were calculated to at least partially eliminate changes resulting from short-term economic fluctuations in agricultural markets. Having compared the variables assessed, changes in Polish agriculture and their directions were defined. Subsequently, based on a literature review and an analysis of observed regularities between provided support and identified changes, the relationship between farmers' decisions and CAP instruments was determined. Next, the analysis covered 2004-2012. The period was also divided into two sub-periods: 2004-2007 and 2008-2012, applying the same procedure as before. What is more, changes were analysed in dynamic terms. The two-stage analysis allowed for assessing the CAP impact both in initial post-accession years and later after the accession. Furthermore, comparing second- (2004-2012) with first-phase (2004-2009) results of the study made it possible to determine the relative stability of changes in Polish agriculture after 2004.

Analytical work focused on identifying the relationship between the level of support provided to holdings, and income and changes in production. The analysis was performed, splitting between economic classes, production types and FADN regions. The following research profiles were distinguished: holdings as a whole; holdings by economic size classes: very small (VS) of up to 4 ESU, small (S) of 4-8 ESU, medium-small (MS) of 8-16 ESU, medium-large (ML) of 16-40 ESU, large (L) of 40-100 ESU, very large (VL) of over 100 ESU; holdings by farming types: field crops (FC), horticultural crops (HC), permanent crops (PC), milk production (DC), other grazing livestock (H), granivores (G), mixed production (M); holdings by FADN macro-regions: Pomorze and Mazury (POM-MAZ) – Warmińsko-Mazurskie, Pomorskie, Zachodniopomorskie and Lubuskie voivodeships; Wielkopolska and Śląsk (WLKP-ŚL) – Kujawsko-Pomorskie, Wielkopolskie, Dolnośląskie and Opolskie voivodeships; Mazowsze and Podlasie (MAZ-POD) – Podlaskie, Mazowieckie, Łódzkie and Lubelskie voivodeships; Małopolska and Pogórze (MLP-POG) – Śląskie, Małopolskie, Podkarpackie and Świętokrzyskie voivodeships. Calculations were performed using a number of variables generated in the FADN system divided into the abovementioned regions, which concerned the following categories: selected information on production, production value, production costs, operating subsidies, income per agricultural holding.

The econometric model of β-convergence, adapted to the level of a county, was used to identify the processes of local convergence. This approach, in turn, implies the use of specific indicators and the structure of the analysis. The analysis of the convergence of regions and countries adopts the level of GDP or GDP per employee as a measure of the level of development. At the local level (county), such measures, unfortunately, cannot be applied. Therefore, assessment of the level of development of counties, and then the processes of equalization of these levels, uses the level of own income of the county per 1 inhabitant of working age. It should be noted that the size of this category of income is quite often used in research on local development. It is the function of income obtained in the county, such as income of individuals, legal persons or income on their property or land. These revenues are therefore a function of income received from all factors of production located in the unit.

The initial stage of the study involved descriptive and comparative analysis of the state and changes in rural counties' own income in various systems determined by the level of this income category and the scale of the use of instruments to support the development of entrepreneurship financed from the budget of the European Union. The next stage was to analyze the size of own income depending on the amount of funds received in the county from the budget of the European Union under the Operational Programme Human Capital, Innovative Economy, the Regional Operational Programme and the Programme Development of Eastern Poland, per one worker of working age. As part of these programmes, many activities could be classified as

direct or indirect instruments to support entrepreneurship in rural areas. In this case, the median size was also used as a criterion of the grouping.

The next stage of the research was to analyze the Gini coefficients, which are used to determine the level of diversity of objects in the population in terms of specific characteristics. The purpose of these coefficients was to increase knowledge about the process of local development and verification of the results of the analysis of basic statistics characterizing changes in own income per one inhabitant of working age.

The efficiency of regional and structural policy instruments to support the development of non-agricultural economic activities was assessed in respect of financial transfers from the EU budget through the Regional Operational Program (ROP), Innovative Economy Operational Program (IEOP), Human Capital Operational Program (HCOP) and others. While assessing the efficiency of financial support, both direct and indirect non-refundable support, which influenced the development of SMEs, was examined. Furthermore, the assessment of these instruments received by far the most attention in the study. However, such an approach was taken, because the EU budgetary period had finished, thus a need to assess the effects of the policy pursued in various aspects. The study of efficiency involved descriptive and comparative analysis of the state and changes of private and micro-enterprise number in rural counties' in various aspects determined by the scale of EU financial support for the development of entrepreneurship. The analysis is also focused on the relationships between this support and the employment and unemployment in rural counties. The criterion for grouping was the median and quartile value of the support per one inhabitant in working age. Finally the correlation and simple regression analysis were utilized for the assessment of the impact of financial support scale on the county budget revenues and creation of new businesses and jobs.

The above analyses use the data from CSO Local Data Bank for 2004-2013 for 1,529 rural counties. The population of this group of counties was without the units with own income in excess of the average value of income by more than 3 standard deviations. These were mainly counties obtaining substantial income from compensation for mining damage and those of typical tourist profile.

3. Theoretical background

3.1. Concept of market failure – rationale for government intervention

The extent and type of instruments of the regional and structural policy of the European Union result from the postulate of an active role of government in the process of eliminating inefficiencies of market mechanisms within the concept of market failure [Cf. Bator 1958, pp. 157-175]. This concept suggests that in the conditions of the market economy, the structure and size of supply are not reflected in adequate level of demand as a result of the lack of autonomous re-balancing mechanisms [Medema 2007, p. 33]. In practice, the processes of allocation of goods and services, despite the assumption of conditions of perfect competition and complete information as attributes of a complete market, show a number of difficulties [Hayek 1939]. As a result, the state of actual equilibrium achieved by the market is characterised by the allocation of goods and services, which does not comply with Pareto optimum [Baumol 1952]. In broader terms, the concept of market failure is a trend in economic theory which identifies the scope and circumstances of observed defects of market mechanisms that lead to the perpetuation of market imbalances. In this context, one points out the positive aspects of market intervention by public authorities [Stiglitz 1989].

K. Arrow [1951, pp. 507-532] was one of the first to point out that, in fact, one can distinguish two different states of efficiency in the allocation of goods depending on the degree of fulfilment of the Pareto demands. The first approach suggests that each allocation of goods in equilibrium meets only the demand of the so-called "poor efficiency" in the sense of Pareto. In this perspective, there is no balance on the market, which would potentially increase the level of usefulness of all its participants. Collective consideration of usefulness of operators is critical to this approach. In fact, one cannot distinguish an attribute of "equitable distribution" in market mechanisms, as the market cannot be assessed from the perspective of ethical distribution of wealth, skills or holdings [Hammond 1998]. Achieving the state of completeness by the market means lack of barriers to take up business or individual impact on the price level, as well as absolute knowledge of market parameters as a result of equal access to information. All these factors provide a sufficient condition for allocation satisfying the assumptions of Pareto efficiency.

The empirical problem consists in extremely non-utilitarian nature of the assumptions that describe the functioning of the market system. Many entities achieve privileged position against competitors during operating activities because of the unique attributes of knowledge and skills, and the asymmetry in the distribution of market conditions (including size of the assets, tangible and intangible assets, type of goods). In a broader context, the barriers to entry into the relevant market limit

entrepreneurship and prevent all entities from achieving the same competitive position, which in extreme cases leads to monopolization of the market.

The second dimension of the analysis of market efficiency points to the more complex nature. The allocation of goods that meets the demand of the so-called "strong efficiency", when potentially there is no alternative state of distribution of goods on the market, which would allow, at least one, entity to increase usability without deteriorating the state of prosperity in other entities [Rembisz 2008]. We should note, against the background of the first dimension of efficiency of the allocation of goods in terms of Pareto, that any allocation satisfying the postulate of strong efficiency can be classified as "poor", but in reverse terms the relationship is not satisfied. Moreover, even if the transfer of goods allows for an efficient allocation in terms of Pareto, it does not rule out the existence of alternative market equilibriums. This means that market mechanisms lack the natural stimuli, so that the market can consequently evolve to desired equilibrium in terms of Pareto. Even if the market equilibrium assumptions had met the Pareto efficiency assumptions, it would be characterised by a particularly high instability with a tendency to move towards alternative market equilibriums that do not meet such demands [Samuelson 1958].

It should also be noted that complete and competitive markets do not per se provide market equilibrium, which always ensure efficient allocation in terms of Pareto due to a number of boundary conditions. Without implementation of the postulate of complete markets, the market system is naturally inefficient in terms of Pareto [Greenwald, Stiglitz 1986]. In the context of equal forms of efficiency in terms of Pareto, it should be noted that in the first approach, the above conditions are not necessary, as the hypothesis of poor efficiency states that the market is in equilibrium, implying the existence of such a state. However, in the second approach, there are additional assumptions: that there is a pricing structure appropriate for the distribution of resources for a complete and competitive market in equilibrium.

Reflections on the conditions of market equilibrium meeting the Pareto efficiency demands lead to the conclusion that such a state is not only one of many possible, but it is also a very brief one. The state of equilibrium in a complete and effective market in terms of Pareto is a discrete state and possible if a number of boundary conditions are met. Therefore, the question of market failure is permanently present in the analysis of market systems [Bryant 1994].

In practice, the decisions of individual market participants resulting from individual conditions for maximization of their own usefulness lead to the choices that are not always effective from a societal point of view. As a result there is a shortage or accumulation of goods and services in certain sectors of the economy. One of the manifestations of market failure is a persistent phenomenon of insufficient (or lacking) supply of certain goods and services, despite a high and effective demand in the market. That imbalance occurs in spite of the price adjustment mechanism, which, however,

does not ensure achievement of effective market equilibrium due to the inverse supply function. Thus, the size of supply is decreasing from a certain price level, despite its continued growth and existence of effective demand at each price level. The negative correlation between the price level and the size of supply is often an important argument for the presence of inefficient exchange of goods in the market, which requires the implementation of mechanisms of economic interventionism by public administration in order to reduce the supply gap. Economic theory distinguishes a number of reasons for market failure. Conventional ones in this field include: the presence of externalities, attributes of the so-called public goods, the problem of transaction costs. From the 1970s, the concept of market failure has been extended with new arguments in considerations distinguishing primarily factors of information asymmetry from the perspective of: adverse selection, moral hazard, principal-agent problem.

Analysis of the conditions of market failures in the context of the so-called public goods is associated with the postulated State foundations to support the supply of certain goods, which imply significant external benefits to the general public, but there are inefficiencies in their supply in a market based mechanism. The role of the public authorities is to create a social mechanism to availability of public goods through indirect financing system based on compulsory social tribute (taxes) and thus ensure the supply of sufficient size in relation to the actual demand[8]. The attributes used to distinguish public goods in relation to private goods was formulated by Evans [1970, pp. 79-89]. Private goods are created as a result of market competition mechanism, ensuring allocation of private benefits and costs to each individual, and excluding others from use. In turn, public goods are characterised by general and unlimited terms of consumption, and the benefits and costs are not clearly defined or assigned to specific individuals. One can also distinguish public goods of intermediate nature, which are produced by private operators, and the State, although it does not maintain ownership of the means of production, it provides public support (including to SMEs). Public administration determines the rules of supply of such goods or favours the development of specific sectors, establishing the principles of availability or directing support to specific beneficiaries, and the allocation is highly discretionary, as a consequence of regulations corresponding to the economic programmes of political authorities.

In the classical theory of welfare economics the cause of market failure consists in high transaction costs that accompany the conclusion and execution of contracts in the allocation of goods and services. R. Coase [1960, pp. 1-44] was one of the first to

[8] An example of the State's role understood in such a manner is the postulate to ensure the availability of socially desirable goods (merit goods), which, according to R. Musgrave are goods, whose consumption should result from the materiality of social needs, and not the unitary ability to cover the costs of their production. On the other hand, the State should limit the availability of goods, which, due to the extremely high external costs have negative impact on social welfare (e.g. alcohol and tobacco). A manifestation of this concept is the differentiation in taxation of particular goods depending on the scale of their importance in terms of internal benefits and costs [cf. Musgrave 1957].

argue that the costs of the operators should distinguish expenses to identify the relevant transaction prices and the costs of negotiation, conclusion and securing contracts for market transactions. Transaction costs affect the decline in viability of economic activity, which reduces the activity of market participants and leads to inefficient allocation of goods and capital in the economy, and even the lack of sufficient supply of goods on the market. In a first aspect, the parties bear the costs associated with finding contract partners and reaching consensus on opposing negotiating positions. In a second, depending on the types of goods and services, there are the costs of valuation, depending on the scope of their specific attributes that determine the complexity and overall risk of the transaction. The last aspect of transaction costs includes expenditures for legal services and institutional and legal consolidation of property rights.

Incomplete or imperfect information is conducive to a failure of market mechanisms as a result of the rise of inefficient allocation of resources in the market. Because of the imbalance of parties to the transaction in terms of scale of resources and quality of information resources, trading decisions are not optimal in terms of Pareto. Lack of complete market information is the cause that the primary mechanism for the valuation of goods and services does not reflect their actual value, but constitutes a resultant of expectations of parties to the transaction which depends on their knowledge. Influence of subjective factors in the process of exchange undermines the credibility of prices as the primary instrument of efficient allocation of goods and services. At the same time, there may be negative phenomena affecting the level of utility of parties in the market processes, as the lack of complete information makes it risky to conduct economic activity [Mas-Colell, Whinston, Green 1995, p. 1008].

State intervention has opposite meaning in the process of information dissemination within the scope of provision of patent protection and support to innovations resulting from capital intensive investments in research and development (R&D). Here, the state to some extent supports information asymmetry in the market, however, it contributes to economic growth, encouraging market players to invest in projects with a high degree of risk. However, state intervention should not completely replace market mechanisms, but only support transparency and integrity of flow of accurate public information through a set of regulatory incentives [Gwartney 2013, pp. 189-194]. In this context, public administration itself targets the problem of information asymmetry in the scope of assessment and awareness of all the consequences and own regulatory actions. In addition, decision-making mechanisms are often highly bureaucratic and thus create significant barriers to the functioning of market players.

3.2. Economic development and structural changes in agriculture

The characteristic feature of the long-term development of agriculture is its decreasing share in the structure of the national economy and of agribusiness [Jakubczyk 2010]. The degree of industrialisation has always been a derivative of the development

of agriculture, and, consequently, of the food industry [Wilkin 2003]. The economic development consisted in a gradual transition from the agricultural economy to the industrial economy financed from agricultural revenues. This process has proceeded along with an increase in the level of the socio-economic development of the country. The share of agriculture in the gross domestic product decreased, the number of the employed declined and the socio-economic situation of agriculture was increasingly dependent on what happened outside of it, in other sectors of the national economy [Woś 1979, Tomczak 2005]. The stimulus for the development of the economy was the modern sectors, i.e. industry, services, IT. In the theory of economics, those dependencies have been included in the three sector theory[9].

The neoclassical model of structural changes in agriculture emphasises the relationships between the farm size and the scale and efficiency of production. According to this model, it is only an appropriate scale of production that can assure high efficiency [Chavas 2001, pp. 263-285]. Therefore, economic growth and the physical size of farms can: improve their competitive position on the market, make it possible to use of economies of scale, result in reduced production costs, increase the bargaining power in trade, etc. These assumptions are confirmed by numerous studies [e.g. Karwat-Woźniak 1999], according to which it is the group of the largest holdings that achieve economic results that make it possible for them to permanently strengthen their competitive position, which forms the basis to meet the growing demand of the market and competition within the EU's single market. A larger size of farms usually facilitates the implementation of innovation since some of the new technologies can be applied only in large-scale production farms. Although we have seen an accelerated pace of increasing the area of farms in recent years, there are still very significant disparities in their size. Some production costs, regardless of the physical size of the farm, are permanent [Kisley and Peterson 1982, pp. 578-595]. Apart from technology, a significant impact on the pace of structural changes is exerted by a market failure in the mobility of resources, which determines the producers' decisions about the commencement or cessation of farming activities.

Currently, the contribution of agriculture to the industrialisation process, sustainable development, provision of public services or political stability is being reassessed. Today, a modern agricultural holding is sort of an enterprise [Rembisz 2005, pp. 33-46]. It applies advanced manufacturing techniques, is horizontally and vertically integrated with other entities, has the well-developed marketing system, and in its

[9] The concept of the three-sector economic structure, its changes and correctness of the development of sectors (the theory of three sectors of the economy), is inextricably connected with the names of three authors, who built its foundations. This theory was developed in the 1930s by A.B.G. Fisher, C. Clark and J. Fourastie. It is based on a thesis about the changing role of the individual sectors in the historically considered process of development of economies, namely the decrease in the importance of the agricultural sector; growth, stabilisation and then also decrease in the share of the industrial sector and the continuing increase in the role of the service sector, related to the economic development.

decisions it is guided by market trends and consumer preferences [Kowalski, Rembisz 2005]. The modern agricultural holding is characterised by a high degree of complexity, diversity and integration. Thus, the allocation of resources in agriculture becomes increasingly dependent on market forces and forming networks of interbranch connections. The agricultural production is increasingly dependent on the progress in genetic research, the implementation of advanced manufacturing technologies, the development of research regarding the health and nutritional values of food, the application of organic production criteria. Distinguishing between the stage of the production of raw materials and the stage of their initial processing, while still easy, is often more and more fuzzy. The industrialisation of agriculture and its development become inseparable processes.

The agrarian structure in Poland, which currently undergoes transformations, leads to an absolute reduction in the number of farms and polarisation of the area. Agriculture as a sector involved in the creation of the GDP loses its importance to the other sectors of the economy. Therefore, a characteristic feature of the process is de-agrarianisation the national economy and the development of rural areas. Throughout this process, it is extremely important for the ongoing structural changes to result in the improvement of the competitive position of farms and long-term and sustainable rural development. Poland's accession to the EU has generated new economic and organisational conditions to support structural changes in the broadly defined food economy and rural areas [Poczta 2012, pp. 65-99]. The European Union Common Agricultural Policy, by becoming an instrument of the state intervention policy, has provided an opportunity to stabilise agriculture over several production cycles and, at the same time, has become a tool for stimulating the desired structural changes in agriculture, for improving the competitiveness of production, for environmental protection or for multi-functional development of rural areas.

3.3. Policy instruments supporting business activity development

The professional literature contains a wide range of definitions of the term policy [Murzyn 2010, p. 46], which depend on the approach applied, i.e. official and legal, behavioural, functional, rational or post-behavioural. However, it generally means the exertion of influence on various areas of human activity by specific public authority organs. In the case of the policy supporting business activity development, this is the intervention of the state and the European Union in the area of the production of private goods. According to the mainstream economists' opinion, this is an undesirable situation, since the only regulating factor should be the market. Due to the functioning market failures, such as externalities, information asymmetry, unemployment and lack of equilibrium, the European Union adopts the approach of active participation in the public sector in the development of business activity, particularly the sector of small and medium-sized enterprises. The official justification for the construction of the

strategy and initiation of specific measures in this area is the equalisation of the conditions of competition.

Due to the complex nature and scale of the issues associated with the development of business activity, the European Union applies a multidimensional approach to their solutions, since the occurring economic processes are the target of the activity of the cohesion policy, the regional policy and the structural policy. The measures falling under the cohesion policy focus on the levelling of the differences in social and economic development and the convergence between the states and the regions [Murzyn 2010]. The definition of the regional policy indicates that it is a somewhat simplified component of the cohesion policy, since its objective is the reduction of the disproportion between the economies of the individual regions within a given state. A rather different approach is applied in the case of the structural policy, since its objective is to change the existing structures of a given state's economy, e.g. resulting from the relationships between individual branches of the economy, which is meant to lead to an improvement in the resource allocation efficiency. However, the ability of the aforementioned policies to lead to an improvement in the resource allocation efficiency, when the instruments applied are public fund transfers, is a debatable issue. Nevertheless, each of these may have a significant influence on the development of the business activity, and in consequence on the distribution of the national revenue. However, it is difficult to define the durability of the effects achieved as a result of public fund transfers in terms of individual policies.

Therefore, the support for business activity development can be implemented under various policies, defined according to the approach to the issue, the areas of support or the types of instruments used for intervention. However, each case, involves influence by the public sector on the production of private goods and services. The initiated activities also entail defined expenditures for the public-finance sector, which generally causes a reduction in the consumption of public goods. This creates the issue of effective public fund utilisation, which is closely associated with the type of instrument applied in the support. The type of instrument applied in the support determines both the scale of assumed activities aiming to develop business activity and the scale of limiting the consumption of public goods. The application of defined instruments of support can be substitutive or complementary in relation to the production of public goods. The first case sees a situation where the increased public expenditures for enterprises create a proportional reduction in the expenditures for the production of public goods, while the second case sees the production of public goods as a potential factor in enterprise development.

Due to the aforementioned conditions, the professional literature includes a classification of the instruments supporting the development of enterprises. The broadest depiction distinguishes the following instruments [Gancarczyk 2010, p. 139]:

- direct – associated with financial transfers or transfers of specific financial services by the public sector to enterprises fulfilling the defined selection criteria;
- indirect – affecting all enterprises through their business environment.

The direct instruments of supporting business activity must be oriented towards various aspects of the enterprise's operations. They might involve issues associated with the founding of the company, its research and development activity, limited access to information, the initiation of investments or the internationalisation of the conducted activity. Therefore, this is a relatively large group of instruments, which includes the following:

- grants or subsidies for current or investment activity,
- subsidised credits and loans,
- credit guarantees,
- guarantees to the suppliers of venture capital funds,
- public venture capital funds,
- consulting and training services,
- tax reductions and exemptions.

The classification of the above forms of business activity support into the group of direct instruments is determined by the application of company selection criteria. Some of the instruments listed above could also be included in the group of indirect instruments, if they are addressed to all enterprises or people intending to start business activity. However, due to the presence of the transfer of finances or services to the companies, they have been classified as direct. In the case of indirect instruments, the predominant classification criterion is the impact of the broadly-understood business environment [Ariely 2008, p. 48]. Due to this, the instruments in this group listed most frequently in professional literature include the following:

- administration solutions – leading to the limitation of bureaucracy,
- macroeconomic policy instruments – such as the determination of interest rates,
- regulations on business activity initiation, operation and closure,
- the tax system,
- the social and health insurance system,
- unemployment benefits,
- the technical and social infrastructure,
- spatial planning.

Therefore, infrastructure is one of many indirect instruments used to support business activity. However, it is among the few instruments in this group, and the only one among those listed, to use Union funds within the scope of the cohesion policy conducted by the European Union or the domestic regional policy.

3.4. Effectiveness and efficiency – evaluation criteria of policy instruments

Effectiveness is one of the criteria according to which assessment of the policy is made. Generally, it boils down to determining the degree of accomplishment of a given policy objectives [Król 2000, pp. 43-50, Pawłowski 2000, pp. 65-71]. In the case of policy to support the development of entrepreneurship, which uses instruments financed from the EU budget, the objective is economic convergence. This results primarily from Regulation 1083/2006 of 12 July 2006, pursuant to which the actions taken by the EU funds should aim to achieve three main objectives, i.e. convergence, regional competitiveness and employment and territorial cooperation. In this regulation, convergence means improving conditions for growth and employment through increasing and improving the quality of investment in physical and human capital, development of innovation and knowledge society, adaptability to economic and social changes, protection and improvement of the environment and increasing administrative efficiency in least developed countries and regions.

The use of different instruments of regional and structural policy by the European Union for the development of entrepreneurship leads to convergence within the meaning of the Regulation. Transfers of funds contribute to the improvement of the situation in the indicated areas both at the national level and at the level of individual regions [Wasilewski 2011, pp. 9-10]. But this is not synonymous with convergence understood in the context of economic theory. In this perspective, convergence is understood broadly as equalizing the level of development of regions (states) [Łaźniewska, Górecki, Chmielewski 2011, pp. 5, 10-36]. Bridging the development gap between the regions is thus an evidence of the convergence process, and not only improvement of the economic situation. However, the measurements of convergence, meaning the process of approaching the less developed regions to more developed ones in economic terms, use two approaches. In the first one, convergence is evidenced by decreasing differences between the indicators determining the level of economic development, while in the second compares the pace of development or economic growth. In econometric analyses, these two approaches are named respectively σ and β convergence [Bal-Domańska 2011, p. 9]. The choice of a particular type of convergence as a policy goal, however, should be preceded by a preliminary assessment of the potential to achieve each of them, in terms of the given policy.

Policy to support entrepreneurship with the help of instruments financed by the European Union in Poland has a relatively short history. One can accept in principle that it began at the time of Polish accession to the EU in 2004 – although some instruments have been used already in the pre-accession period, such as the SAPARD programme. In such a short period, it is difficult to expect equalizing, for example, GDP per capita in the regions even in the scale of the country. Therefore, the aim of this policy should be convergence type β. Transfer of funds should in fact stimulate economic activity and, consequently, lead to accelerated growth and economic devel-

opment in the regions. However, this growth does not necessarily have to be the highest in the weaker regions. This is confirmed by Kusideł [2013, pp. 149-150], which shows that the economic disparities between EU countries have been steadily decreasing, while increasing in many of the new member states, including Poland. This condition is explained by the Williamson hypothesis [1965, pp. 2-84]. According to this hypothesis, the internal convergence occurs only at higher stages of development of the economies.

The subject of the discussion is not the global convergence of regions as a result of the use of instruments of structural and regional policy oriented on growth of entrepreneurship. This issue is in fact largely explained. Research comes down to the problem of differences in the economic development of rural counties and the impact of these policies on them. The studies conducted so far [Wasilewski 2011, pp. 30-34] show that the pace of development of non-agricultural activities may be higher in rural areas than in cities, and the instruments of these policies have a stimulating effect on the process. But it is not clear whether within the rural areas the level of economic development of the weakest and the strongest territorial units is equal, i.e. whether there is a kind of "local convergence". This problem is important primarily because of the lack of convergence in the regions.

The theory of economic convergence defines the various systems of factors that can support or counteract regions becoming equal in terms of economic development. This is due to the fact that this theory is not autonomous, but is based on a number of theories of growth and development in the territorial arrangement [Łaźniewska, Górecki, Chmielewski 2011], including, e.g. on the theory of cumulative causation, the growth pole theory, sectoral theories or product cycle theories. Each of these theories determines the path of development of territorial units at given properties of the economy of the unit and external conditions. However, this means that support for the development of entrepreneurship under the policy can have different effects in units differing e.g. in the structure of the economy or location. The criteria of support distribution take into account this diversity to a small extent. The authors of the division therefore attempt to assess the impact of the financial support of the European Union on equalization of the level of development of local economies and on determining the importance of processes taking place at the local level for the regional convergence, or even divergence in the present circumstances.

Economic processes occurring at the local level (counties) may be conditioned by the policies, and especially by the financial support of the policy, and lead to the reduction of variation in regions and within rural areas across the country. However, they need not to lead to regional convergence. Convergence, as a result of financial support for the development of economic activity by the public sector could arise in certain specified circumstances. To this end, the bulk of the support will be needed in the less developed regions, and within these regions to territorial units in which the

use of this support would be most effective. Such an approach, however, would not only lead to closing the gap at the local level, but could have a negative impact on the convergence of European Union countries. Examining the processes taking place at the local level will determine the distribution of both directions of support, its impact on the so-called "local convergence", and conclude on the possibility of changes in the criteria for the distribution in order to achieve local convergence.

In terms of closing the gap in local development, the possibility of making changes in the system of support, however, will not mean having to make any changes. Achieving regional convergence is not necessarily a priority for policy. At the same time, reducing disparities in economic development at the local level can be a path of development resulting from Williamson's hypothesis, i.e. leading to the achievement of a certain level of economic development of regions, from which the process of regional convergence in the country starts. Mandatory changes in the support system should be made only in the absence of its impact on bridging local gaps – assuming of course that it was their goal. The use of financial support for the development of entrepreneurship may only have an induction effect, i.e. inducing the development of economic activity. This effect can be the result of a too small scale of support. But it can be still a positive effect of the policy, especially when it is not judged by the criterion of efficiency [Bailey 1999, pp. 179-208].

Use of financial instruments of the policy to support the development of entrepreneurship may have a different impact on the processes of convergence. From the point of view of policy it is important, however, whether this impact actually exists and is positive [Clark, Lee 2013, p. 5, 7, 8]. A attempt was therefore made to evaluate the impact of these instruments on the process of closing the gap in local economic development in rural areas in Poland and to explain – at least partially – the transmission mechanisms of these processes on regional divergence in the country and convergence in the European Union.

The research problem concerned, i.e. the "efficiency of regional and structural policy instruments to support the development of entrepreneurship" is quite controversial. The so-formulated problem demonstrates the active involvement of the state in economic processes and refers the concept of "efficiency" to measures undertaken by the state. Such an approach to economic development is criticised in the economic literature, in particular by mainstream representatives. However, active state economic policy is nothing new. Certain economists expressed a need for state intervention in economic processes, at the same time creating a theoretical basis. Mercantilists, who argued in the 17th and 18th century that the state should be closely involved in supporting the development of industry and trade, are a good example [Landreth, Colander 2005, pp. 60-61]. The mercantilist concept of the role of the state, however, was strongly criticised by Smith and the followers of his classical approach to the economy [Landreth, Colander 2005, pp. 58-63]. Such a situation persisted up to the time of

Keynes, who used certain concepts of mercantilism to demonstrate the significant role of the state in economic development.

In accordance with studies carried out by Stiglitz [2004], certain countries achieved economic success as a result of active state economic policy. Nevertheless, the author states that there are numerous examples of achieving such success with very limited involvement of the state interventionism leading to a waste of resources. However, the positive impact of active state policy on economic development has never been fully denied [Holcombe 2013, pp. 25-26]. Nevertheless, since the time of Smith, the market has been regarded as an instrument for the efficient allocation of resources, which leads to economic development. The concept of efficient allocation of resources should be understood as allocation types that are Pareto optimal. This means that no one can benefit from the allocation of resources without deteriorating the situation of the other [Stiglitz 2004].

Based on the definition of Pareto efficiency, the fundamental theorems of welfare economics were established, namely:

- any competitive market economy is Pareto efficient,
- any Pareto efficient allocation can be achieved through the mechanism of market competition, given the appropriate initial distribution of revenues.

Therefore, the theorems of welfare economics define market-efficiency relations. They do not exclude, however, as does the very definition of Pareto efficiency, the contribution of the state in the allocation of resources. As a matter of fact, the first theorem states that the smooth functioning of the market mechanism leads to the efficient allocation of resources. However, it does not deny achieving efficiency under distorted competition conditions, which can be compensated using a centralised allocation mechanism. In accordance with the second theorem, however, market competition can lead to multiple Pareto optimal solutions. Some of these solutions, although efficient, can be in conflict with the idea of fair distribution of revenues. An example in this respect is an often-considered model situation, in which all the revenues are held by one person [Kwarciński 2007, pp. 109-124]. This in turn justifies state intervention in the allocation of resources.

Therefore, the theory of welfare determines the easiest way for the economy to achieve Pareto efficiency. However, this is only possible under perfect market conditions. In practice, the correct functioning of the market, however, is distorted, which may lead to inefficient trade, production or its structure. These distortions occur due to market failures [Stiglitz 2004], which include:

- competition failure,
- failure resulting from the existence of public goods,
- failure resulting from externalities,
- market incompleteness,

- asymmetric information,
- unemployment, inflation, imbalance.

Active state policy for the development of entrepreneurship, based on the use of a wide range of instruments [Wasilewski 2011, pp. 30-34], is justified primarily by market failures which result from under-utilisation of labour resources. This is unemployment which makes state institutions intervene in the allocation of resources by means of measures, such as support for training and career counseling or direct subsidies for running or launching own economic activity, etc. Furthermore, failure resulting from asymmetric information is important as regards support to SMEs. In the event of these failures, state intervention involves the reallocation of some resources from one group of entities to the other. Instruments for such transfer are taxes on the one hand, and on the other hand direct subsidies or subsidies in the form of public goods. In theory, such transfers are justified, given the decreasing marginal utility of goods.

If the transfer of funds deteriorates one's situation, Pareto efficiency does not improve. However, Kaldor-Hicks efficiency may improve. This approach aims at maximising the allocation of wealth or welfare expressed in money [Stringham 2001, p. 42]. A general increase in welfare is justified, even if the situation of a certain group of people deteriorates. Regardless of the approach to efficiency improvement, the benefits resulting from transfers should outweigh the costs. In general, the resulting net benefits are a measure of the efficiency of given allocation. However, the state making a social choice in the allocation of resources, which is not accompanied by Pareto efficiency improvement, must also take into account the loss of certain individuals or groups.

The aforesaid interpretation of efficiency, although very general, determines the nature of the relations between allocation and its effects, and the path to achieve them. Nevertheless, this interpretation is an indicator for assessing the efficiency of applied research which, however, uses different approaches to efficiency assessment and the assessment concerned is carried out in multiple dimensions. For example, three approaches to efficiency assessment are derived from the organisation theory [Pawłowski 2007, pp. 32-37]:

- objective approach – aimed at determining the degree of achievement of set objectives and the level of costs associated with these measures;
- systemic approach – aimed at determining the capacity of an organisation to reduce risk in its relations with the environment and create an environment conducive to its activities, which is sometimes expressed as the capacity to raise funds from the environment and the effects of their use;
- multi-criteria approach – being a kind of combination of the approaches presented above; not only refers to the degree of achievement of set objectives, but also to meeting certain conditions and exceeding existing standards [Pennings, Goodman 1977, pp. 160-164].

As already stated, the above approaches are used to assess the efficiency of an organisation. This raises the question as to whether policy or individual regional and structural policy instruments for the development of entrepreneurship can be assessed in the same way. The answer to the question can be affirmative in the case of the objective approach to efficiency assessment. They are very often used to assess policy or its instruments. However, the assessment of policy in terms of the degree of achievement of set objectives is referred to in the literature not related to the organisation theory as the assessment of policy efficiency [Król 2000, pp. 43-50, Pawłowski 2000, pp. 65-71]. Nevertheless, policy efficiency can be assessed by reference to specific objectives set for particular policy instruments or to general objectives, e.g. EU policy convergence [Wasilewski 2013, pp. 8-11].

However, the systemic approach gives slightly different possibilities to assess policy efficiency. In this case, the efficiency of particular policy instruments can be assessed by reference to the reaction of an organisation, which is an enterprise, to a specific instrument. This reaction may, however, be two-fold. Firstly, the uncertainty of an enterprise in its relations with the environment may decrease which, in some cases, can improve its position relative to other elements of the system, to which other enterprises may belong. As regards this approach, the direct financial support of specific enterprises, as a result of the policy pursued, can be efficient, but undesirable. Their competitive position may become too strong. However, such a situation results from the second reaction, i.e. using these funds in running economic activity. Higher efficiency, productivity and profitability achieved by an enterprise thanks to the transfer of public funds improve its competitiveness (as already mentioned). Therefore, the systemic approach to assess the policy of financial support to the SME sector may cause certain ambiguity in the results obtained. On the one hand, the assessment is in fact positive in relation to the results obtained; on the other hand, undesired changes to the system may occur. However, these changes can be beneficial in areas characterised by under-developed economic activities. Such transfer not only strengthens the economic sector concerned, but also contributes to the development of the business environment. In this approach, an organisation is in fact open. However, another aspect of efficiency should be considered. The capacity of an organisation to acquire valuable and scarce resources is in fact regarded as an efficiency factor [Pawłowski 2007, pp. 32-37]. In this case, EU fund raising itself may indicate higher efficiency of one organisation in respect of the other, i.e. unable to raise EU funds. In some cases, however, this may lead to a reduction in funds obtained from the market.

Nevertheless, multi-criteria efficiency can be assessed in many dimensions. As an example, the seven-dimensional approach for assessing efficiency, which can be found in the literature [Bielski 1992, pp. 115-130], needs to be considered. The approach covers:

- tangible dimension – relates to meeting especially external objectives, generally ignoring costs thereof. In particular, non-economic organisations are assessed in this dimension;
- economic dimension – assesses performance, productivity or profitability, i.e. cost-effect relations;
- systemic dimension – assesses functioning in the environment concerned;
- "political" dimension – assesses the development of relations with the environment and the involvement of staff in meeting set objectives;
- political dimension (not in quotation marks) – assesses an impact on socio-political relations;
- cultural dimension – assesses the capacity to change or the possibility to consolidate certain cultural norms;
- behavioural dimension – assesses a degree to which the individual objectives of specific organisation members (employees) have been met.

Given the multi-criteria assessment of the efficiency of an organisation, it can be said that also policy to support the development of SMEs and even its particular instruments can be assessed in multiple dimensions. In point of fact, the transfer of funds to an enterprise affects not only the relations of production factors within such an organisation, but also triggers a number of other changes both inside and outside this organisation. In principle, such policy-induced changes can occur in all of these dimensions. It seems, however, that the systemic approach will provide the most complete picture of the efficiency of policy and its instruments, as only a narrow range of influence is assessed in other cases. The tangible dimension of the assessment ignores, e.g. incurred costs, so does the economic dimension with the external effects of changes in an organisation.

In fact, the systemic approach assumes that a particular operating system is assessed in two aspects [Pawłowski 2007, pp. 32-37]:

- efficiency of its internal structure, i.e. relations between its specific elements;
- efficiency of its relations with the superior system, reflected by the capacity to shape the environment as a whole.

While assessing policy to support SMEs, the operating system will be an enterprise receiving this support, rather than a specific instrument. In other words, the efficiency of policy instruments can be assessed by reference to changes in the internal and external efficiency of the operating system concerned, triggered by the use of a particular instrument. However, this is only the case when the impact of the policy instrument considered can be isolated from numerous factors that determine efficiency changes in each category. Furthermore, the systemic approach allows for assessing component efficiency, i.e. within the framework of the abovementioned categories,

and overall efficiency, which is internal and external efficiency. This is also quite important when assessing policy. As a matter of fact, the use of specific policy instruments does not necessarily entail the same changes in the internal and external efficiency of the operating system.

In accordance with Pawłowski [2007, pp. 32-37], improving efficiency is of interest not only to the enterprise considered, but also many entities in its environment. Among them, the author mentions:

- municipal population,
- municipal budget,
- state population,
- state budget,
- public funds,
- EU budget and funds.

In practice, there may be some other entities interested in the efficiency of an enterprise. Therefore, efficiency analyses can be carried out for various purposes, thus determining their scope. For this reason, the literature divides efficiency analyses as follows:

- microeconomic analysis – including, among others, profitability or financial performance assessment,
- mesoeconomic analysis – assessing so-called local efficiency,
- macroeconomic analysis – determining state efficiency,
- EU analysis.

These efficiency analyses can also be applied when analysing regional and structural policy instruments to support the development of entrepreneurship. Direct subsidies for SMEs on their day-to-day operations and investment activities are an example of an instrument that can be assessed according to the scheme above. The transfer of these funds triggers efficiency changes actually in any scale. Nevertheless, determining overall efficiency in this approach would be very complicated and would require sophisticated econometric methods. For this reason, efficiency analyses, whose scope is conditioned by their addressees, are most common in the literature. However, assessing policy instruments to support the development of SMEs, by reference to their efficiency changes, will not be objective.

When considering the efficiency of financial instruments to support the development of SMEs, the type of their effects should be taken into account. The economic literature [Stiglitz 2004] pays particular attention to the impact of a specific instrument on the price of a particular good. If the transferred support leads to a reduction in the price of goods manufactured by an enterprise, then the substitution effect can be observed. In fact, consumers choose subsidised goods due to their lower prices. This in

turn makes such an enterprise inefficient, and consequently – its policy. Nevertheless, signs of the growing scale of substitution should be a signal to refrain from such policy.

So far, the efficiency of policy and its instruments has been addressed mainly in the context of the organisation theory. These considerations were based on an assumption that the efficiency of the policy pursued is determined by the resulting internal efficiency of an organisation, i.e. an enterprise herein, and the efficiency of relations with the environment or, depending on the approach taken, with the superior system. However, policy is also part of the existing institutional system. When considering its efficiency, it is therefore important to check how this issue is addressed in both economic and economic theory trends, whose main focus is the role of institutions in economic processes and the consequences of pursuing specific solutions in the construction of the institutional system.

Currently, the New Institutional Economics is one of the main trends addressing the role of institutions. In accordance with North [2005, pp. 22-23], institutions create both formal and informal rules for organisations. Amongst economic organisations, the author mentions, among others, companies, trade associations or cooperatives. Nevertheless, he also distinguishes the group of political organisations, including: political parties, the legislature, as well as regulatory and enforcement authorities. However, the existence and functioning of organisations hinge on their objective, which may be profit maximisation as for economic organisations or re-election in the case of political parties. Regardless of their nature, their universal objective is, however, survival under deficiency conditions leading to competition. Yet, policy involves a specific playing field, which allows for changing the degree of achievement of set objectives. Identifying organisations associated with particular policy and changes in the achievement of their objectives may be one of the directions of assessing the efficiency of policy in relation to the theory of the trend concerned.

However, the approach above is very general. Nevertheless, the review of literature reveals that the New Institutional Economics has no precise concept of efficiency, as in the case of Pareto or Kaldor-Hicks efficiency. Its theorists, however, refer to efficiency in their studies. For example, North [2005, pp. 22-23] states that "... firms, political parties, or even institutions of higher learning, faced with rival organisations, must strive to improve their efficiency". In accordance with the author, "muted" competition reduces the incentive of organisations to invest in new knowledge and, consequently, does not induce sudden institutional change. However, strong competition boosts institutional change. In general, this means that competition boosts efficiency and knowledge-raising is a means to this end. This raises the question of what implications it has for assessing the efficiency of policy to support the development of SMEs, in particular by means of direct subsidies.

The New Institutional Economics addresses efficiency also in the context of the theory of property rights. However, this approach requires a so-called private legal system to be in place, which [Rubin 2005, pp. 207-208]:

- defines property rights,
- allows for the transfer of ownership,
- protects property rights.

Having a legal system in place that fulfils its role in the aforementioned areas is in turn a prerequisite for market efficiency. In the context of the theory of property rights, policy measures should therefore be aimed at strengthening the system of property rights, while ensuring market efficiency will prove the efficiency of the measures taken. This form of support for the development of SMEs should be applied also in Poland, especially due to high transaction costs associated with the transfer and protection of property. As regards the theory of property rights, there is one more issue related to support in the form of subsidies. In accordance with the theory, the efficiency of initial allocation is of secondary importance if the transfer of property rights is allowed. Property rights will be granted anyway to entities which will give them the highest value. So, if we allocate them by means of policy to less efficient entities, the market will correct the decisions taken anyway.

This statement follows from the Coase theorem [Coase 1960, pp. 1-44], which states that if property rights are transferable and transaction cost is not too high, the exact definition of property rights is unimportant, because parties may transfer these rights, as a result of which they will reach their highest price. Therefore, Coase introduces a prerequisite to adjust initial allocation, which is transaction cost. This in turn leads to a situation in which resource reallocation to the most efficient owner is only possible if an increase in the value of the property rights owned is greater than transaction cost. Otherwise, the rights will remain to rest with less efficient entities. When assessing the efficiency of allocation by means of policy, these relations should therefore be estimated at first. If a prerequisite allowing for the reallocation of property rights of resources is met, and they still rest with the entity to which they were allocated by means of policy, it would mean that they were granted to the most efficient entity.

In general, the above considerations suggest that any form of intervention, which may also include EU direct financial support to SMEs, slow down the efficient allocation of resources. Nevertheless, they can be a key driver for economic growth, as was the case in China. In accordance with Murrell [2005, pp. 688-690], the dual economy model plays such a role. As a matter of fact, the use of different intervention forms strengthens "marginal" efficiency. In relation to the New Institutional Economics, this means a temporary approval for a set of informal rights allowing for submarginal production. However, it provides social protection for entities which would lose the most due to reforms, i.e. transition to a purely market economy [Lau, Quian,

Roland 2000, pp. 120-143]. As a matter of fact, the result is a slowdown in the said reallocation, but – according to neo-institutionalists, it allows to gain time to develop protection mechanisms for market transactions. Given the social aspect of the dual economy, it can be said that certain solutions can be applied also in Poland. In fact, the use of such mechanisms is well-founded in the Constitution of the Republic of Poland, which defines the state economic system as a "social market economy". However, assessing policy efficiency in accordance with dual approach criteria would necessitate the determination of a degree to which the policy instrument concerned supports entities which would lose the most in the absence thereof. This in turn implies a need to establish criteria for the classification of entities to a so-called "group of losers".

It is practically impossible to develop a model for assessing the efficiency of public support that uses all of these approaches. Certain theory assumptions make their unification very limited or even impossible. However, the literature attempts to provide a relatively comprehensive assessment. An example in this respect is the assessment of the efficiency of this assistance in SEZs [Nazarczuk 2012, pp. 113-133]. For the purpose of this research, the author classifies the assistance granted as costs. The achievement of objectives regarding the establishment of zones, state budget revenues, the National Health Fund and the Social Insurance Institution, as well as the financial performance of managing entities are effects. This approach, however, ignores the following issues: efficiency of entities which received funds and opportunities to reallocate these funds by the market, those arising out of the theory, i.e. economic slowdown, impact of support on prices and its effects or the political objectives of policy makers. This somehow confirms that it is almost impossible to develop a fully comprehensive model for assessing public support. Therefore, it seems reasonable to carry out such an assessment in terms of a particular theory and compare the results obtained with those of other approaches.

4. Structural changes in agro-food sector during Poland's membership in EU

4.1. Macroeconomic situation

Polish integration with the EU structures was a milestone which affected the acceleration of structural transformations in the entire national economy. The dynamics of this process resulted from, inter alia, the adoption in Poland of new solutions and regulations in the field of the economic policy, including the agricultural and trade policy, access of more than 505.7 million[10] consumers to the market, inflow of public financial resources from the structural funds, cohesion policy and the CAP policy or the free movement of persons, goods and services.

In 2000-2012, a macroeconomic situation in the Polish economy was relatively stable (Table 4.1). In the same period, the GDP grew by 4-7% per year. Indeed, the world economic crisis of 2008 caused a slowdown, but GDP developments were positive throughout the period considered. The nominal GDP per capita grew by over 100% to reach about PLN 41 thousand in 2012. In the first half of 2014 Poland's GDP increased by 3.3% compared to the same period of previous year. At the same time, domestic demand grew by 5.1%. These data show an economic recovery when compared with the tough last year, when GDP grew by 1.6% (year/year) in the entire year and domestic demand dropped by 0.2% [Wigier 2014, pp. 41-55].

The growth rate was stabilised by EU structural funds and domestic demand. Since Poland's accession to the European Union in 2004 the country has come a long way. A strong support in this process has been and continues to be provided by the inflow of structural funds granted in the framework of the EU's cohesion policy. In the EU's 2007-2013 budget, the subsidies for Poland amounted to nearly EUR 68 billion, the highest sum among the EU funding beneficiaries. According to the Regional Development Ministry's data as of September 30 2014, since the launching of EU subsidies programs of the 2007-2013 framework, authorities and beneficiaries signed 103,370 contracts for the total sum of PLN 409.7 billion of qualified expenses, including co-funding on the part of the EU amounting to PLN 284.6 billion. The inflow of EU funds to Poland will increase in 2014-2020, as the EU budget for the period, approved by the Europarliament in mid-November 2013 set the funds allocation for Poland at EUR 105.8 billion (PLN 441 billion), including EUR 72.9 billion (PLN 303.6 billion) in the Cohesion Policy framework and EUR 28.5 billion (PLN 118.8 billion) as Common Agricultural Policy payments. As a result of a new calculation of the EU funds'

[10] Eurostat data as of 1 January 2013 http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Population_statistics_at_regional_level/pl (date of reading: 24.11.2014).

value meant to adjust them to current prices, slated for the end of 2012, the 2014-2020 Cohesion Policy funds pool for Poland are likely to still increase to EUR 82.1 billion.

The factors stabilising the development rate were high investments, at the level of about 13-17% of the GDP value, inflow of financial resources from the structural funds, foreign direct investments (FDI) and internal demand. Poland has so far stood out in terms of FDI among the CEE countries. According to UNCTAD's Internet database, accessed at the beginning of May 2013, the foreign direct investments inflow to Poland between 2006 and 2011 totalled about USD 94.9 billion and was the highest in the region. According to UNCTAD data, the inflow of foreign direct investments (FDI) to Poland amounted to USD 6.2 billion in 2013. The Polish government agency forecast 2014 FDI to slightly exceed 2013 threshold.

Strong internal demand and solid private consumption used to be named by economists as strengths of the Polish economy, helping the country to retain its economic growth even in the face of difficult conditions on international markets. CSO data show, that after the difficulties in 2013, when Polish economy in Q2 has slowed down a bit – Poland's retail sales grew by 1.2% in Q2 2014. In comparison, in the whole 2013 Polish retail sales grew by 2.3% (compared to the same period of last previous).

The unemployment rate gradually decreased, from about 15-19% in the period preceding integration with the EU to about 10% in 2012. The inflation rate oscillated around the inflation target designated by the Government (from 1 to 4%). Poland is now the sixth-largest economy in the EU. Living standards more than doubled between 1989 and 2012, reaching 62% of the level of the prosperous countries at the core of Europe.

Table 4.1. Selected macroeconomic indexes in 2000-2012

Specification	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP value in PLN billion (fixed prices of 2012)	1,025	1,037	1,051	1,091	1,146	1,190	1,264	1,349	1,420	1,443	1,500	1,566	1,595
GDP *per capita* (current prices in PLN thousand)	19.5	20.4	21.1	22.1	24.2	25.8	27.8	30.8	33.5	35.2	36.8	39.7	41.4
Dynamics of GDP changes [previous year = 100]	104.2	101.1	101.4	103.9	105.3	103.6	106.2	106.8	105.1	101.5	103.8	104.5	101.9
Share of investments in GDP [in %]	17.9	15.6	13.5	13.2	13.1	13.3	14.6	16.3	17.0	16.3	15.3	15.9	14.9
Inflation (CPI) [previous year = 100]	110.1	105.5	101.9	100.8	103.5	102.1	101.0	102.5	104.2	103.5	102.6	104.3	103.7
Unemployment rate [%]	15.1	17.5	18.0	19.6	19.1	17.6	14.8	11.2	9.5	8.2	9.6	12.5	10.1

Source: Own elaboration based on the CSO data. Statistical Yearbook of the Republic of Poland, CSO, Warsaw, subsequent years and www.stat.gov.pl, access date 20.08.2014.

Good economic position of the country supported the strengthening of the national currency against euro and the US dollar. The inflation rate, in particular in the first years after Poland's accession to the EU, significantly dropped. The dynamic economic growth translated into the reduction of the unemployment rate and general improvement of the income of Polish citizens. This, in turn, was reflected in the growing demand, including demand for food products. However, the share of the latter in household budgets remains substantial (ca. 25% of the general expenses). Following the accession to the EU relative food prices significantly increased. Substantial growth of non-food cost of living also contributed to the slowdown of the dynamics of the demand for food. In the conditions of limited growth of the national demand for food, the foreign trade played an important role in the use of surplus products.

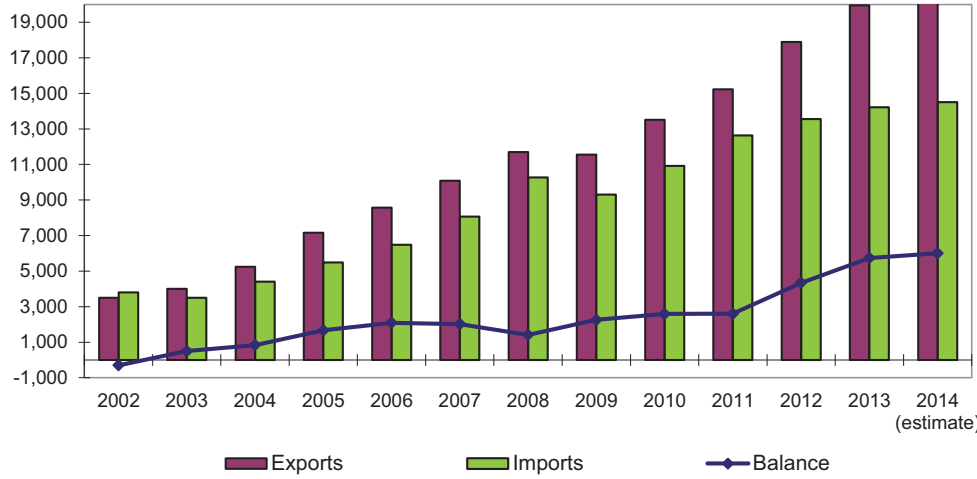
The foreign trade plays also a prominent role in stimulating GDP growth. Upon accession to the EU, Poland was included in the Single Market. Since 1 May 2004 Polish entrepreneurs and traders have been subject to the Community Customs Code and the Common Customs Tariff applicable to trade with third countries. Within the framework of the Single Market, Poland is covered by protective trade measures (anti-dumping and anti-subsidy proceedings and safeguard investigations) which allow better protection of domestic producers from unfair competition.

Following years of stagnation or sluggish growth Polish foreign trade in agri--food products soared after EU accession [Pawlak 2013]. Previously a net importer of food products, Poland has become a net food exporter. In 2014 estimated export surplus amounted to about EUR 6 billion (Figure 4.1). The positive balance is generated by trade in products of the food industry, and the surplus is several times higher than deficit in agricultural trade (Figure 4.1). The share of the Polish agriculture in creating the added value following the accession to the EU shows a tendency to decrease. Currently it is at the level of 3-4%. At the same time, agriculture employs ca. 15% of the total number of employed people, which is indicative of low labour efficiency.

The development prospects of agriculture less and less depend on conditions endogenous to the sector and increasingly depend on sectoral policy and, primarily, macroeconomic policy [Czyżewski, Grzelak 2011, pp. 21-31]. Growth trends in the whole economy are of paramount importance to the competitiveness of the food sector. Positive macroresults spread to agriculture and its environment. GDP growth stimulates disposable income, which in turn translates into increased demand for food products. Market conditions in agriculture represent an integral part of the overall economic environment and the economic situation of agriculture primarily depends on the general economic situation. In a market economy, the main determinant of the economic situation of agriculture is final demand for agri-food products. According to National Accounts, between 2002 and 2012 an increase in GDP by 1 percentage point results in growth of private consumption of food by 0.5-1.0 percentage point. The upper

limit to the growth rate of demand for food depends thus on the growth rate of disposable income and the income elasticity of demand for food.

Figure 4.1. Polish foreign trade in agri-food products in 2004-2014 (EUR million)



Source: Authors' own calculation according to: Handel zagraniczny produktami rolno-spożywczymi. Stan i perspektywy, No. 20-40, "Analizy Rynkowe" 2005-2014, IERIGŻ-PIB, ARR, MRiRW, Warszawa.

The analysis of factors influencing structural changes in Polish economy demonstrates that the economic growth model prevailing in Poland is based on classical production factors: labour, land and capital, as still few sectors of the economy rely on knowledge and skills as important factors of growth, in line the requirements of a knowledge-based economy. Higher rates of economic growth require investment, thus a labour-saving and investment-oriented distribution of national income. Investment and the programmes to reduce unemployment involve in turn limitations on real wages increase. The greater the rise in real wages, the more benefits enterprises derive from reduction of employment. Slower growth of unit labour costs in order to increase employment, facilitates combating inflation and balancing the state budget through lower costs of the indexation of wages in the public sector.

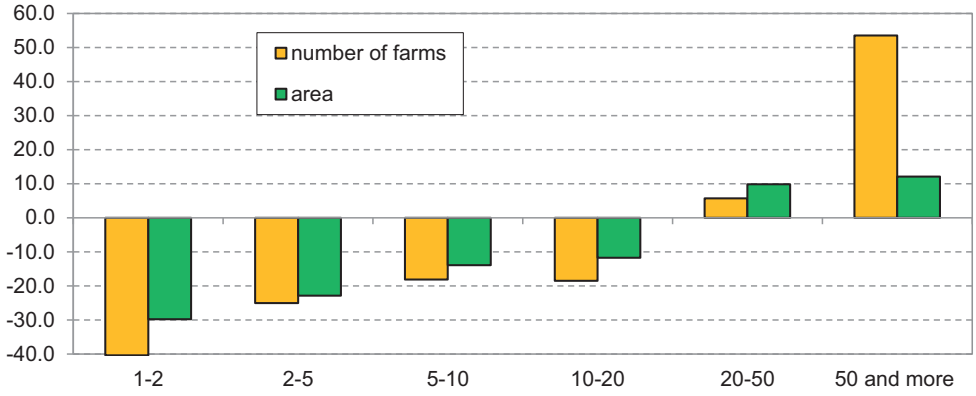
4.2. Transformations in agriculture

Following the accession to the EU, as compared to the pre-accession period, the dynamics of the drop in the utilised agricultural area, arable land in particular, significantly decreased. On the other hand, the decreasing tendency of the area of the multiannual plantations was reversed, as in 2012 their area was 20% bigger than in 2004. It might be suspected that changes are relative to Poland's inclusion in the CAP

policy, in particular from the implementation of direct payments and support for multiannual plantations.

There have been major changes in the agrarian structure which continued long-term trends. In the period preceding accession to the EU (1996-2002), large agricultural holdings (20-50 ha UAA), which took over arable land from small and medium agricultural holdings, but also from holdings of over 50 ha, developed dynamically. The growth in numbers was accompanied with the decrease of surface. The arable land of holdings below 1 ha grew, but their number dwindled. Following the accession to the EU, the number of holdings decreased by 28%, and their surface – by 3%. The development of large holdings lost dynamics, but still arable land were taken over by holdings of the surface of 20 to 50 ha, for both smaller holdings, of which the number and area decreased, and bigger, the number of which, despite the decrease of the area, grew. The limiting of the number of the biggest holdings is relative to the implementation of regulations limiting the area of family agricultural holdings and the ending of the lease period in second half of the previous decade. The number of holdings taking over land slightly increased. The number of holdings smaller than 1 ha decreased by 27%. To a slightly lesser extent the number of small and medium holdings decreased (from 25% to 16%). Their area also shrunk, including, to a largest extent, in the group of 10 to 20 ha (by 8%). These changes indicate that the Polish agriculture, despite major changes, is still to a large extent dispersed (Figure 4.2).

Figure 4.2. Change in the number of farms and area of agricultural land broken down by area groups of farms between 2002 and 2012 (%)



Source: Authors' own calculation according to CSO data.

In 2002 26% of agricultural holdings did not run agricultural activity, and in 2012 this share decreased to 16%, which confirms the thesis of the growth of productive and pro-market orientation of holdings. After transformation into market oriented economy in Polish agriculture there appeared a slow increase in the fixed assets share

in the structure of means of production, on the one hand, and, on the other, depreciation of fixed assets was observed [Ziętara 2012, pp. 297-308]. Average image of the Polish agriculture is very unfavourable in this regard. In 2012, the use of fixed agricultural assets exceeded 76%. This situation concerns mostly buildings and facilities. The usage of machinery is considerably lower. While, following the accession to the EU, the investments largely increased, and their share in the value of fixed assets almost doubled, it does not change the general situation of the Polish agriculture. Firstly, investments are made by large holdings, economically strong secondly, investments concern in majority the machinery and not buildings and facilities used in agricultural production. The estimated number of farms amounts to 150-250 thousand [Józwiak 2012]. Agricultural activity conducted in the remaining farms does not enable recovery of fixed assets which increases its usage.

It is very difficult to estimate the unemployment in rural areas. According to CSO data, the number of employees in agriculture has been relatively stable recently and it was at the level of slightly over 2 million. Nevertheless, the so-called "hidden unemployment" is included in these numbers, as significantly large part of family holdings members spend little time working in agriculture. Undoubtedly, the employment in agriculture decreases. Currently ca. 22-24% of the working age rural residents work in agriculture. It should be pointed out, that 40-45% of the total number of the unemployed live in rural areas. Following the accession to the EU, this proportion slightly increased, but it resulted from the reduction of unemployment in other sectors of the national economy.

Agricultural production in Poland, plant production in particular, is characterised by significant variability. It mostly results from lower technological level and relatively low-quality soil that considerably increases the plantation sensitivity to atmospheric conditions. Following the accession to the EU there was certain improvement in terms of production technology. However, it was not sufficient to considerably reduce fluctuations in production, especially due to serious weather anomalies observed in this period.

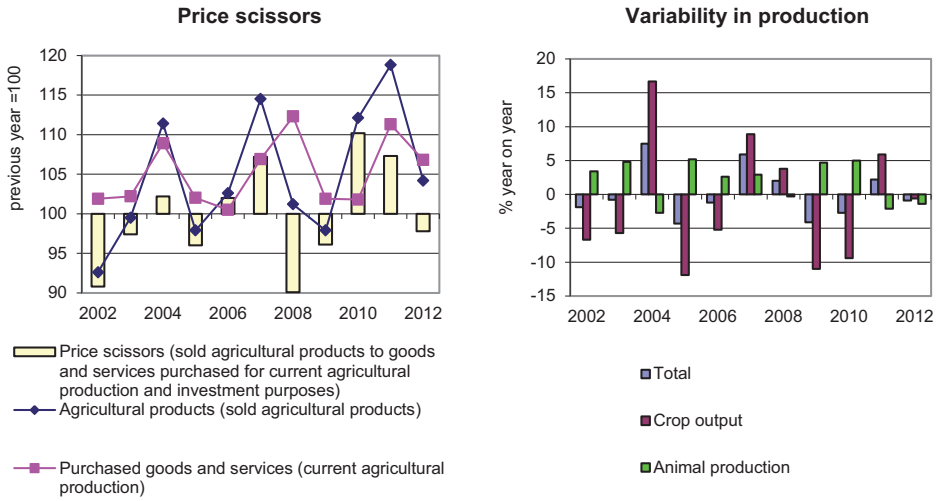
The value of agricultural production was on the increase in 2002-2012. Nominally, the value of global[11] and commercial output increased approximately twice (PLN 103 billion and PLN 75 billion respectively). In real terms (in 2002 prices), the increase in the value of production[12] in 2012 reached PLN 62 billion and PLN 43 billion respectively, which means that it increased by 11% and 24%. On average over the

[11] The output is the sum of plant and animal products obtained during a year in a given farm. Its primary source is crop production, animal production and income from mechanisation services, but also processing. The output reflects the actual size of the agricultural production. It is therefore a measure that makes it possible to determine the production orientation of an enterprise [Woś 1999].

[12] Calculated by means of the cumulative rate of increase in the price of the output and commercial agricultural production.

year, the output value increased at a 1% rate, and for goods it increased at a 2% rate. A faster growth in the value of commercial production than the output results from greater commercialisation of production and increased marketability of agriculture. The share of commercial production in the output in the period in question increased by 10 pp. to 72%. Fluctuations in production cause changes in prices of plant products and, consequently, result in business fluctuations in livestock sector, and change in the production level (Figure 4.3).

Figure 4.3. Index of price scissors and variability in production in Polish agriculture (%)



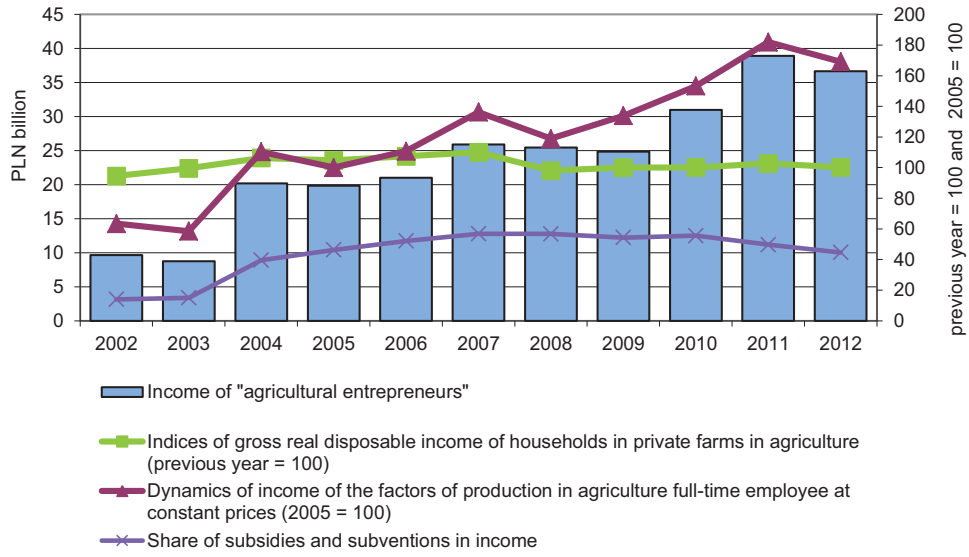
Source: According to CSO data, Statistical yearbook of agriculture 2013, Warsaw, 2014.

Following the accession to the EU no major changes were observed in the share of plant and animal products. There were certain shifts within both categories. In 2012, compared to 2005, the gross output in fixed prices of 2005 grew by over 13%, including plant production by 15%, and animal production by 8%. Compared to previous periods, the dynamics of the growth of agricultural production following the accession grew by several times.

The income of the agricultural sector significantly increased after the accession to the EU [Czubak, Poczta, Sadowski 2011, pp. 61-82]. A sudden increase of income was noted in 2004 (over PLN 20 billion against less than 10 billion in 2002 and 2003), namely in the first year after Poland's accession to the EU and covering the national agriculture with the CAP income support system. In following years the dynamics of income growth was slowed down, yet a clear growing tendency was observed. In nominal prices their value in 2012 amounted to almost PLN 37 billion, as compared to less than PLN 10 billion in the pre-accession period (Figure 4.4). The growing income of

the sector, combined with employment reduction, resulted in significant growth of income calculated per persons employed full time. In 2012 their amount was almost twice higher than in 2005 and almost twice as high compared with the pre-accession period. The share of subsidies and grants in income as a result of the implementation of direct payments and other measures investment aid schemes increased from 15 to more than 50 percent.

Figure 4.4. Income in the Polish agriculture and their dynamics in 2002-2012



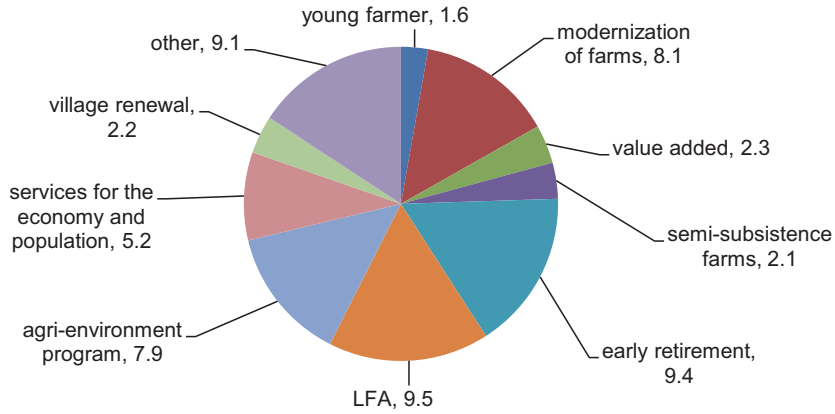
Source: Authors' own calculation according to CSO data.

The EU funds had a significant share in the financing of transformations in agriculture until Poland's accession to the EU [Czubak 2013]. The direct payments are the most common type of support, each year about 1.4 million of farmers use this form of support. The value of payments in the 2004-2012 period increased from ca. PLN 6 billion to PLN 14 billion per year. When calculated per one farm it reaches an average of ca. PLN 9 thousand, and this form of support is used by 87% of farms having an area of more than 1 ha. An equally important source of income (regardless of production, and only based on the farm's location) are payments for less-favoured areas (LFA). Each year these payments are granted to ca. 700 thousand farmers, i.e. half of those receiving direct payments. The land surface covered with LFA payments amounts to ca. 6.9 million ha. These payments are made to farmers on an annual basis. The manner of spending of the resources is not subject to settlement. Smaller farms usually allocate the granted payments to current needs and means of production (fuel, fertilisers), while the bigger ones also make investments.

The resources earmarked for investments are also an important source of aid for farms [Forgasi, Wieliczko, Wigier, Toth 2014, pp. 55-76]. In order to obtain them a farm has to prepare a business plan and gain its acceptance from a body managing the programme. So far, the financial resources for investments in farms available under SAPARD, SOP "Agriculture", RDP 2004-2006 and RDP 2007-2013 were used in their entirety. By 2002 a total of 15% of farms benefited from measures aimed at improvement of competitiveness of farms. The greatest share, i.e. 6% benefited from measure "Modernisation of agricultural holdings", 5% from "Early retirement", 2.7% from "Setting up of young farmers" and 1.3% from "Diversification of agricultural activities". The value of grants is rather considerable, and in the current RDP 2007--2013 their average value as calculated per one beneficiary is even higher. In measure "Modernisation of agricultural holdings" it exceeded PLN 140 thousand, in measure "Diversification of agricultural activities" – PLN 84 thousand, and in "Setting up of young farmers" – PLN 66 thousand.

In the 2004-2012 period, the cumulative value of support for the agri-food sectors from three main sources of support, i.e. a grant from the national budget to KRUS, a grant from the national budget co-financing of the CAP, and payments from the EU budget, exceeded PLN 370 billion. The largest share of these payments were subsidies to insurance (38%) and grants coming directly from the EU budget (over PLN 160 billion, i.e. 35% of the above amount). Aid for the implementation of the CAP was approx. 27% of the total amount [Czyżewski, Poczta-Wajda, Sapa 2011, pp. 63-72].

Figure 4.5. The expenditure of the RDP 2007-2013 – as on 30.08.2014 (PLN billion)



Source: Authors' own calculations based on monitoring of ARMA data.

RDP 2007-2013 with a budget of nearly PLN 72 billion is the largest of the CAP investments programs [Matuszczak 2013, pp. 33-43]. Its participation in the CAP expenditure exceeded 33%. Given the budget for RDP 2007-2013, sharing between the

principles of agricultural models, we can assume that the program in approx. 41% supports the development of industrial agriculture, 34% – socially sustainable agriculture and 25% – environmentally sustainable agriculture (Figure 4.5) [Wigier 2013 b, pp. 22-42]. It should also be emphasized that the remaining programs, the implementation of which was completed in 2004-2006, despite the modest budget, gave a strong impetus to investment and "demonstration" on farms and in rural areas, and public aid has become a stimulus for investment activities.

An improvement of competitiveness in agriculture depends on structural changes (that predetermine the efficiency of production factors used) and on development of the entire national economy, especially in the context of capacities to create new jobs outside agriculture. The rural development programmes, direct payments and changes in the entire economy accelerated structural transformations in agriculture, which consisted e.g. in concentration of production.

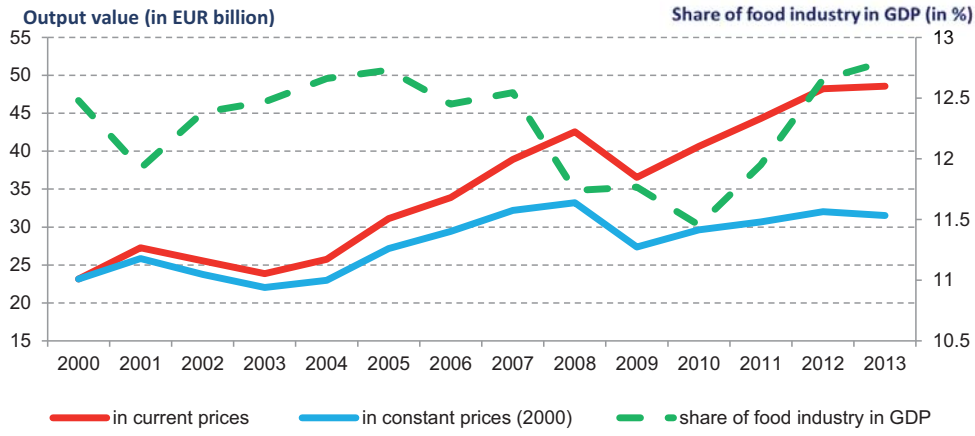
4.3. Changes in the food industry

Changing the economic system after the year 1990 triggered the process of structural transformation in the food industry. These changes were caused by the privatization process, restructuring and inflow of capital. In turn the development and improvement of competitiveness occurred mainly in the first decade of the twenty-first century, and particularly rapidly in the first years of the Polish membership in the EU. Over the last ten years there has been increase of: investment and modernization of production, labour productivity, value of production and value of exports. These phenomena constitute a firm basis for further strengthening the competitive position of Polish food industry on the national and EU markets.

In the period 2000-2013 the value of Polish food industry production sold has nearly doubled (Figure 4.6). There was particularly dynamic growth between 2003 and 2007, which was initially related to the prospect of Poland's entry into the EU and the increase in food prices, and later was primarily the result of increased agri-food product exports and growing domestic demand. The economic downturn that in most EU countries turned into a short-lived recession contributed to a halt to the rapidly growing Polish food industry production sold. In nominal terms, over the whole period, growth in the value of production amounted to 6.8% per annum and in real terms approx. 3.8% per year.

All food branches increased sales and, in comparison with industry as a whole, a higher rate of growth of production sold was observed in the meat and poultry (8.2%), confectionery (8.1%), bakery (7.6%) and dairy (7.1% annually) sectors. A small decline in the real value of production sold occurred in the sugar industry (by 0.8% per year). A higher real rate of decline in production sold was observed in the tobacco and wine industries and equalled 2.1 and 2.5% per year respectively The share of the food industry in GDP fluctuates of approximately 11.5 to 13%.

Figure 4.6. Development of the output value



Source: Authors' own calculations based on CSO data.

In 2000-2012 in food processing industry three stages of development can be distinguished:

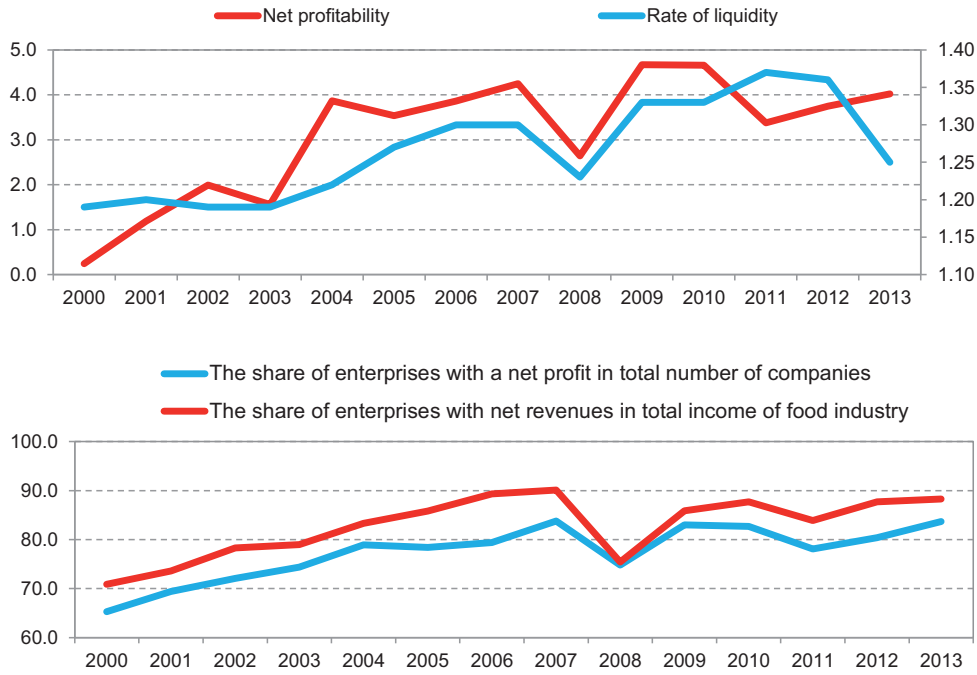
- 2000-2003: in-depth restructuring of sectors and firms, and accelerated adjustment processes to compete in the Single European Market, in conditions of fragmentation and dispersion of activity;
- 2004-2007: integration with the European Union and high recovery; and concentration processes with the development of specialised production;
- 2008-2012: initial slowdown in economic growth (as a result of the economic crisis) and then an upturn (overcoming crisis phenomena), while maintaining a relatively stable business structure.

Food processing is characterised by high fragmentation and a low level of concentration. This is due to a lower level of technical development of this sector and the nature of the object of labour, determined by the variability of processed agricultural products. Other significant characteristics of the food industry include its high relation to local and regional markets, assortment diversity and relatively short production series and short shelf life of products. Significant impact on the process of concentration of production in the food industry had the transnational corporations. Their impact was both positive and negative. The corporations positively influenced: the process of transformation, the accelerations of restructuring of many industries, technological progress (introduced not only in their factories, but also through their imitation by other companies), increase in wages, improvement in the quality of market offer, accelerated processes of specialization of production. The corporations influenced negatively: the monopolistic practices, transfer of profits abroad. Corporations activity contributed also in the demise of many domestic companies and contributed to a rise in unem-

ployment. Transnational corporations' share in the value of sales of sectors of the Polish food industry is estimated at about 40%. This participation was increasing slowly but steadily. Therefore, the activity of TNCs is a competition for domestic producers.

Food producers have the most of competitive advantages, most of which relate to price and quality; they have significantly increased production and exports, and consequently improved their economic and financial situation [Urban, Mroczek 2010, pp. 45-59]. The improvement of the condition of the food industry was also significantly affected by the public support given to the sector in connection with the Polish accession to the European Union (both in the pre-accession period and in the period of Polish membership). An improvement in the financial performance of the food industry was evident directly after the accession of Poland to the EU. The increase in profits was accompanied by increased liquidity (Figure 4.7). The good economic and financial situation shows that the industry has proved to be quite resilient during the global economic crisis.

Figure 4.7. Financial situation of food industry enterprises



Source: Authors' own calculations based on CSO data.

In 2003-2007, the systematic improvement of performance and financial standing was recorded for most enterprises in the food industry. Small and short-term deterioration was recorded in the first year of global economic crisis (in 2008). It was,

however, short lived and temporary, because there was a marked improvement in the next year – 2009, up to a level not seen throughout the transition. General economic performance for several years has been good, and the financial standing has been secure and does not present risks for the continuation and development of economic activities in the production of food, beverages and tobacco products. Such risks are not created by little stability in profitability of certain industries either, because these were short-term and accidental phenomena, arising from external circumstances.

The processes of globalisation and integration have influenced the change of trends in the entity structure development of the food industry. Concentration of production processes returned to the sector, which replaced the tendency for fragmentation of processing occurring throughout the transition period. In 2012, almost 16 thousand companies were active, i.e. the smaller number by more than 28% than in 2000. Large companies, however, represent only 1.8% of all food companies, with decrease in their number in 2000-2012 (from 349 to 283). The number of medium-sized companies is 1,114 (about 285 entities less than in 2000), which represents almost 7.4% of all food companies. In the group of small companies, a decline was recorded between 2000 and 2012 in the number of entities by 13.7% (from 5,269 to 4,604). These companies represent more than 31% of the total number of enterprises. The number of micro--companies shrinks fastest, because in 2000-2012 it decreased by as much as 1/4 (from 12.9 to 9.7 thousand), but they represent almost 60% of the total number of enterprises.

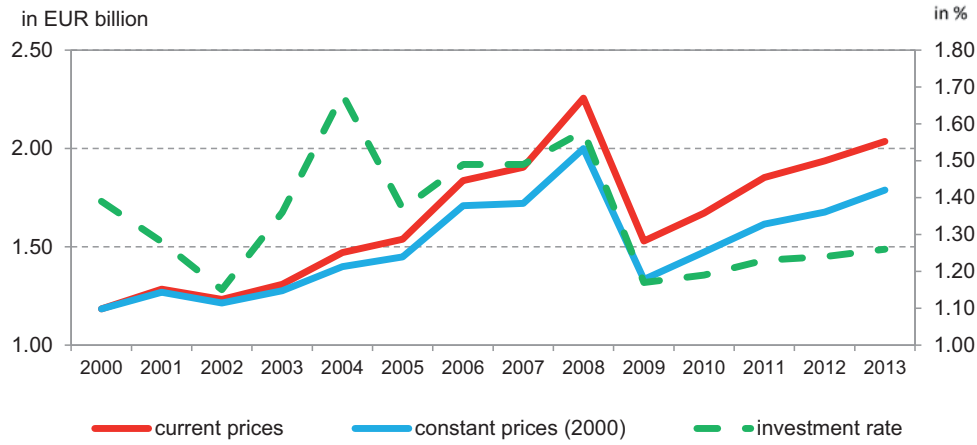
The production structure of the food industry in Poland, as in most EU countries, is dominated by industries processing animal products (i.e. meat and dairy), and the central role is played by the processing of pork and milk. In total, these industries produce nearly 40% of the industrial food and drink production. This share is growing steadily (since 2000 by about 4 percentage points). In employment the share of the above industries is 41%; in comparison with the EU-15 it is higher by almost 10 percentage points. This may indicate the use by the Polish food industry of more labour--intensive technology and lower productivity. The importance of cereals, feed and oil processing has somewhat increased in the last few years. They produce a total of about 12% of the value of production, while the fruit and vegetable industry is nearly 10%. The production of beverages (ca. 16%) is still very important (though declining) in the structure. Most dynamic development in the last decade was characterised by secondary processing of food (an increase of 85%) and manufacture of substances (an increase of nearly 50%), and less dynamic by pre-processing (up to 35%) and primary processing (up to 13%). Highly processed food production grew by 6.4% per year, substances – 4%; secondary processing – 3%, and the standard food production – slightly more than 1% per year.

The perspective of Poland's entry to the European Union resulted in increased capital expenditure in its food industry. Investments have led to improved production efficiency, reductions in employment and labour productivity growth. Labour produc-

tivity measured by gross value added increased from around PLN 69 thousand[13] per employee in 2000 to PLN 100 thousand per employee in 2010. Despite visible progress in productivity growth in Poland, it was still on average more than 40% lower than in the EU-15.

During the economic downturn, processing companies made more sensible investments (Figure 4.8). Investment restrictions were not dictated by lack of financial resources, as in the 2009-2010 period profits from the food industry amounted to ca. PLN 7.9 billion, which was the highest in the past decade. The uncertainty on the market stopped new investments. A large investment in the food industry increased the value of assets. In spite of this, however, consumption of fixed capital has increased. The greatest part of depreciated assets are the means of transport.

Figure 4.8. Annual amount of investments (in EUR billion) and investment rate (in %) in the food-industry



Source: Authors' own calculations based on CSO data.

An important role in the transition process of the food industry has been played by support of investment with public funds from the EU budget and national resources. In the SAPARD programme, it was targeted at industries that should be adapted to the EU sanitary, veterinary, environmental protection standards and those pertaining to proper treatment of animals. Therefore, mainly sensitive sectors were supported, in which the following industries were included: meat, poultry, dairy, and fish by granting them transitional periods. In the next two programming periods (2004-2006 and 2007-2013), access to State aid was already very extensive. It was possible to apply for support for enterprises in industries processing products, contained in Annex 1 to the Treaty establishing the European Community (in 2007-2013,

[13] In fixed prices of 2010.

also wholesale). It therefore concerned most industries and entities assigned to the category of micro, small and medium-sized enterprises, and medium-large companies, that is, with fewer than 750 employees or with annual turnover not higher than EUR 200 million. More than 40% of companies benefiting from the investment aid are medium-sized companies employing from 50 to 249 workers, whereas according to the CSO data the percentage of such companies in the country amounts to about 10%. These results are not, however, surprising because it is much easier to benefit from State aid to larger companies since they have greater economic potential, creditworthiness and greater human capital resources.

In 2002-2012 investments in food industry focused mainly on: improvement of the sanitary and hygienic as well as veterinary conditions of production (23% of the total value), improvement of production quality (25%) and introduction of new or modernisation of the existing technologies (20%). Almost two thirds of all projects delivers one of the three objectives. The shares of investment pertaining to the improvement of animal welfare was 1%, creation of new and rationalisation of the existing marketing outlets was 2% and reducing the negative impact on the environment was 4%. The total investment in the sector, in 2000-2012, was equal to EUR 21 billion. Approximately 5% of the investments was financed by EU subsidies. Although the public resources are a change stimulator, in the whole food industry investments, they represent only an additional source of financing. Development of the most important agri-food industries, supported by external resources, has been and is a necessary condition of sustainable development of food economy.

5. Analysis and assessment of the CAP instruments influencing the production decisions of farmers according to FADN data

5.1. Changes in agricultural holdings' income according to FADN data

Agricultural income is one of the fundamental economic categories, being the essential objective of running production activity by an agricultural holding [Zegar 2001, p. 15]. It is profit secured from running this activity obtained by deducting the costs or expenses incurred from the revenue generated. The level of farmers' income determines the standard of living of their agricultural families, as well as development opportunities for their holdings, including investment activity, i.e. the main factor of growth in agricultural income [Musiał, Mikołajczyk 2004, p. 185].

The level of agricultural income, in contrast to the income of the employed, varies greatly between agricultural holdings. This phenomenon is not only due to differences in human capital resources and material production capacity of a holding, but also to the efficiency of farming [Zegar 2001, p. 16]. The income situation of agricultural producers depends mainly on the volume and value of production activity, the level of production inputs, state macroeconomic policy, as well as on the relationship between prices of both agricultural products and means of production (i.e. "price scissors"). The level of income is also associated with the level of CAP financial support and, in particular, with direct payments.

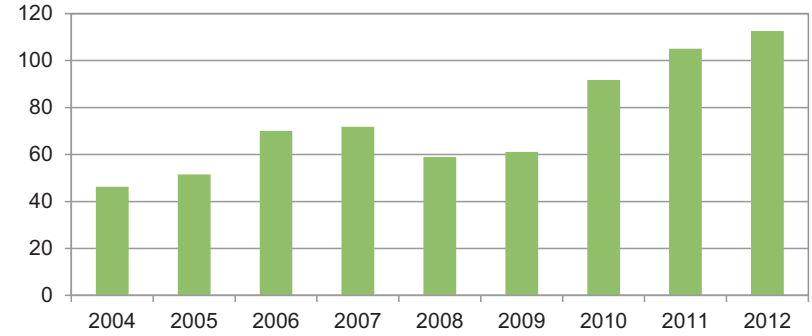
The EU accession has contributed to a significant improvement in the income situation of the agricultural sector. A nearly two-fold increase in agricultural holdings' income was observed in 2004, i.e. in the first year of Poland's accession to the EU and the functioning of domestic agriculture under the CAP support scheme. In the next years, this trend continued. In 2008-2012, the average level of income per holding was PLN 86 thousand, which is over 40% more than in the first years of EU membership. Diversification of agricultural producers' income was primarily due to the level of their productive resources, operating and investment subsidies, the economic situation in the agricultural market, as well as the costs of the factors of production used.

This clear improvement in the income situation of Polish agricultural holdings observed in the early years of integration resulted from the beneficial impact of CAP mechanisms. Among all the relevant EU agricultural support instruments, direct payments were crucial in generating farmers' income, stabilising it and mitigating the diversification of agricultural production profitability. Complementary payments were also of great importance. They increased the value of income of not only holdings oriented towards crop production, but also indirectly of entities specialised in livestock breeding [Judzińska, Łopaciuk 2012, p. 51]. Income growth was also possible thanks

to favourable shaping of the price scissors index, as well as the favourable exchange rate of the euro, conditioning the actual level of the subsidies granted.

The steady upward trend in the income of agricultural producers observed in the first years of integration was temporarily halted in 2008, when the average income from an agricultural holding fell by 18% on average. It was due to a clear market downturn, reflected in a slowdown in both production and trade turnover, caused by, among others, a significant increase in production costs (Figure 5.1). In subsequent years, holdings' income grew rapidly once again and was more than twice higher in 2012 in nominal terms than in 2004.

Figure 5.1. Income from a family agricultural holding (PLN '000 per holding)

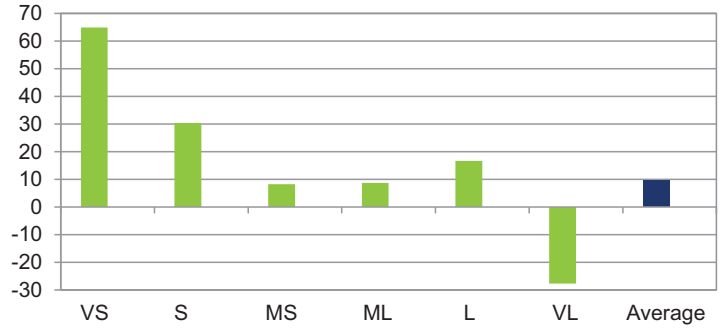


Source: Own study based on FADN data.

The analysis showed a wide variation in the income situation between individual groups of agricultural holdings. A significant correlation was observed between farmers' income and holdings' economic size, as well as the main direction of production. Furthermore, there was a steady increase in the share of operating subsidies in agricultural income. In 2004, its level in the average agricultural holding amounted to only 12%, while in 2012 – to nearly 45%.

The value of agricultural holdings' income increased along with an increase in their economic size, which resulted mainly from the specificity of the EU support scheme (including subsidies paid to the area of arable land), as well as diversified production capacity (available resources, infrastructure) between individual groups of holdings. In the initial period of integration, the average income of very large holdings was nearly 25-times higher than in small and very small holdings, where it stood at no more than PLN 16 thousand on average. Nevertheless, the former were the only ones reporting losses from their economic activity. This was a result of a high rate of growth in production costs, which was almost twice as high as an increase in the value of production. However, a positive growth rate occurred in other groups of entities; the income situation of the smallest holdings improved the fastest (Figure 5.2).

Figure 5.2. Rate of changes in agricultural holdings' income
by economic size classes in 2007-2009
(2004-2006 average = 100, in %)

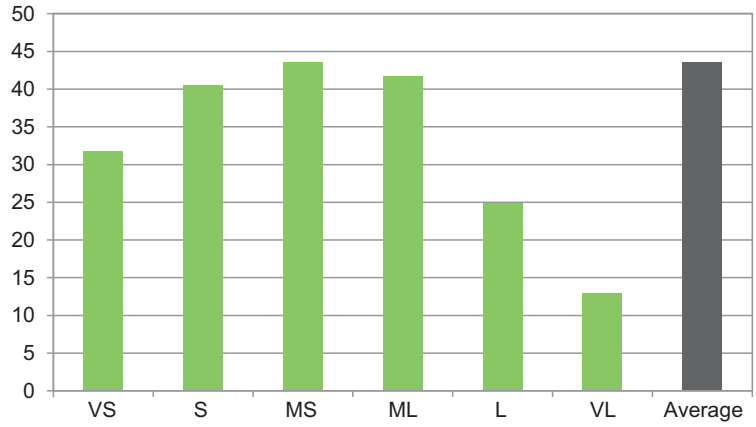


VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

In subsequent years, all economic classes noted a considerable rise in their income. The highest growth in this respect was reported by medium holdings (Figure 5.3).

Figure 5.3. Rate of changes in agricultural holdings' income
by economic size classes in 2008-2012
(2004-2007 average = 100, in %)



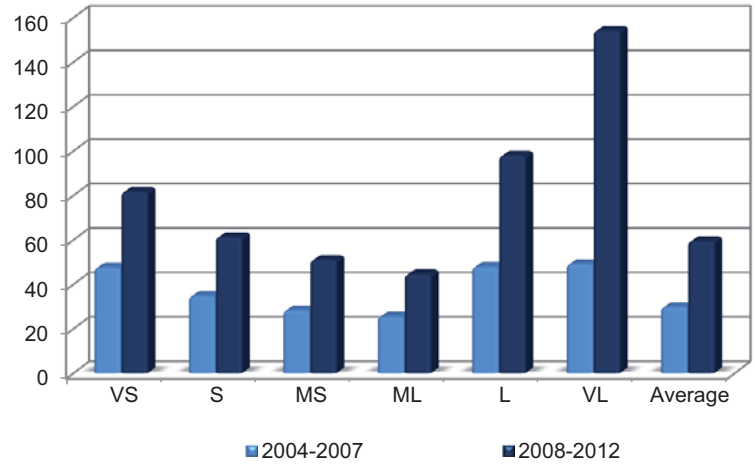
VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large.

Source: Own calculations based on FADN data.

All holdings grouped by economic size noted an increase in the share of subsidies in generating their income. This process was the fastest in the largest (strongest) entities with a large area of arable land, while the slowest in holdings with average

economic power and land resources. Throughout the analysed period, the share of subsidies in income reached the highest level in the smallest, large and very large entities, as opposed to other holding classes. In other holding groups, an increase in the share of subsidies in agricultural producers' income decreased along with an increase in economic size (Figure 5.4).

Figure 5.4. Ratio of operating subsidies to income from a family agricultural holding (by economic size classes, in %)



VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

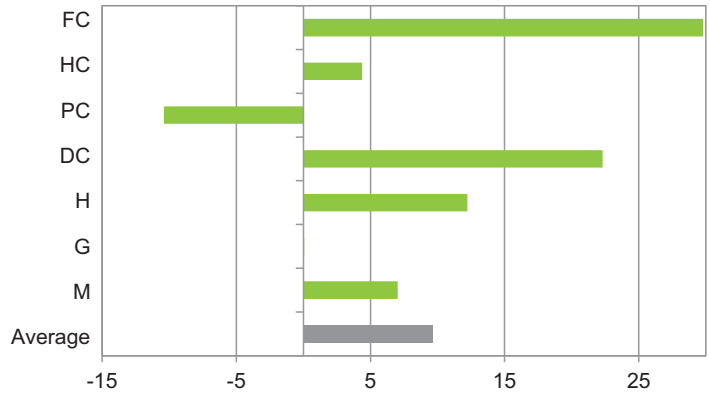
Source: Own study based on FADN data.

The development of agricultural holdings depends largely on the ability of farmers to increase the volume and quality of their production, as well as finding outlets for their products. Choosing the right type of production, suited to existing conditions, allows for a systematic increase in agricultural income [Ginter 2011, pp. 83-87]. Farmers themselves decide on their production profile, taking account of market and financial factors, as well as restrictions resulting from lack of adequate resources, production capacity or qualifications. Moreover, these decisions may be influenced by CAP instruments, including access to non-market support in the form of direct subsidies [Poczta, Czubak, Pawlak 2009, pp. 40-52].

The level of agricultural producers' income to a large extent was determined by profitability and scale of their production, its intensification and degree of processing, as well as holdings' market orientation. Therefore, the highest income in 2004-2009 was generated by holdings specialising in granivore breeding, while high income was achieved by horticultural and dairy holdings. The worst economic situation was observed in mixed production holdings which are the most common in the entire population.

Income growth was noticed in the majority of holding groups by farming types. At the same time, until 2009, the highest increase was reported by holdings specialising in field crops and milk production. However, the economic situation of permanent crop farmers significantly worsened, while the level of income in holdings specialising in granivore breeding remained the same (Figure 5.5). In 2009-2012, similar trends were observed, although the situation of horticultural holdings in this regard deteriorated, while that of orchard and granivore holdings clearly improved (Figure 5.6).

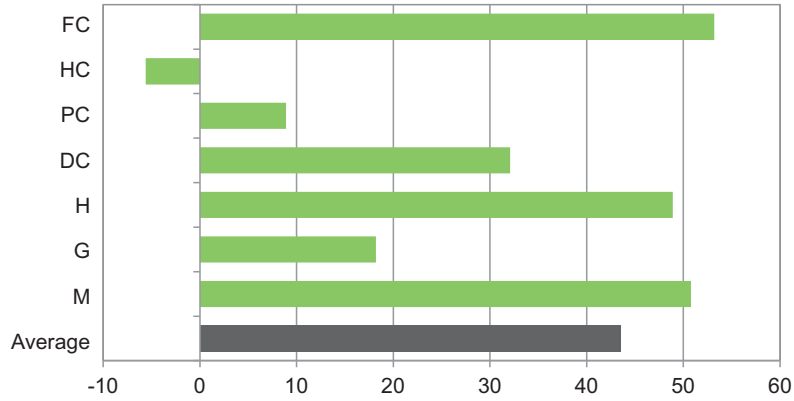
Figure 5.5. Rate of changes in agricultural holdings' income by production types in 2007-2009 (2004-2006 = 100, in %)



FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

Figure 5.6. Rate of changes in agricultural holdings' income by production types in 2008-2012 (2004-2007 = 100, in %)

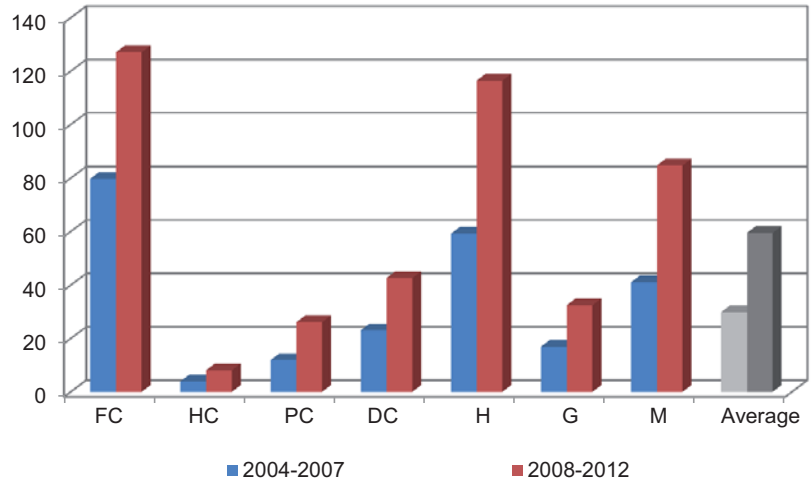


FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

During Poland's membership in the EU, an increasing dependence of holdings on non-market support has been observed. The greatest dependence was characteristic of holdings with production based mainly on land resources for which complementary payments were granted. This phenomenon was most evident in mixed production holdings oriented towards field crops (in total, 3/4 of all holdings) and those grazing livestock. However, to a much lesser extent, subsidies determined the level of farmers' income in horticultural holdings, as well as those engaged in livestock production, whose operational activity was not related to the use of land, as the main factor of production. These entities were able to obtain much higher income, as opposed to other holding types due to, among others, more efficient and intensive production and stronger market orientation (Figure 5.7).

Figure 5.7. Ratio of operating subsidies to income from a family agricultural holding (by production types, in %)



FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

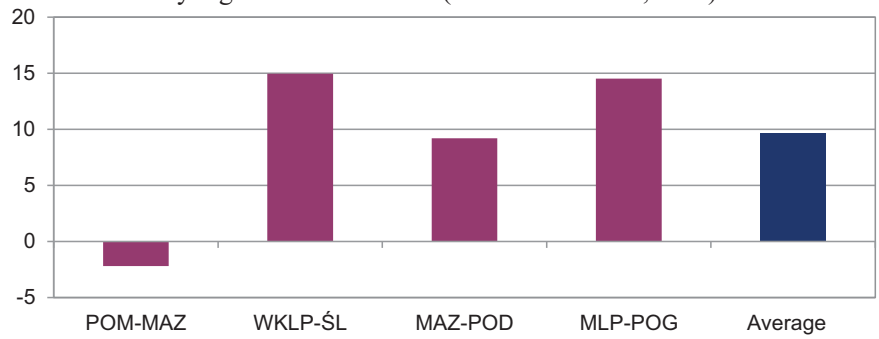
Source: Own study based on FADN data.

Moreover, location had a significant impact on the income situation of agricultural holdings, as evidenced by differences in the amount of income earned in various parts of the country. The ability to generate income in a given region depended mostly on its agrarian structure. It determined directions of agricultural production corresponding to economic, natural, infrastructure and social conditions existing in the area concerned. Indirectly, these structures also determined farmer's opportunities for obtaining CAP support.

Having compared holdings' income throughout individual FADN regions, it can be concluded that there are significant differences in its level between western and eastern Poland. Significantly higher income was reported by holdings from "Pomorze and Mazury" and "Wielkopolska and Śląsk" regions, which was due to their better production capacity, lower fixed costs and favourable agrarian structure. However, lower income was generated by agricultural producers from south-eastern Poland, i.e. regions characterised by higher agrarian fragmentation, lower economic power and a lower share of capital in production.

The convergence of agricultural income was observed in the form of reduced regional disparities in its level. Nevertheless, in 2007-2009, agricultural holdings in the region characterised by higher income ("Małopolska and Pogórze" region) achieved the highest increase in this regard, while the rate of income generated by holdings from the area with a much more favourable economic situation was negative ("Pomorze and Mazury" region) (Figure 5.8).

Figure 5.8. Rate of changes in agricultural holdings' income by regions in 2007-2009 (2004-2006 = 100, in %)



POM-MAZ – "Pomorze and Mazury" region, WKLP-ŚL – "Wielkopolska and Śląsk" region, MAZ-POD – "Mazowsze and Podlasie" region, MLP-POG – "Małopolska and Pogórze" region

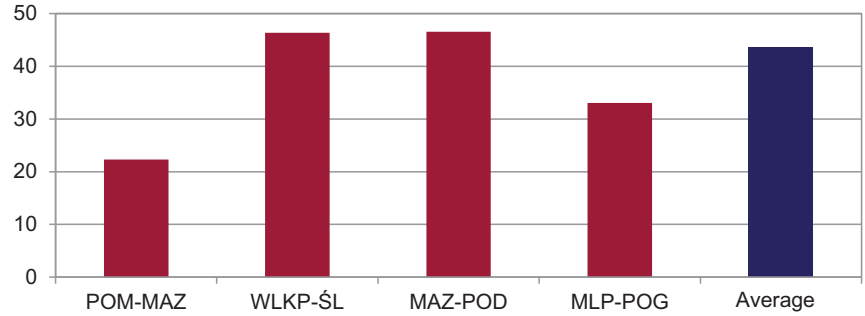
Source: Own study based on FADN data.

The current decade has once again brought an increase in the rate of income growth. In all regions, the rate of changes was positive (Figure 5.9).

The analysis of holdings' income throughout FADN regions by economic classes showed that, among the smallest and largest entities, the highest income was generated by farmers from the "Pomorze and Mazury" region, while in the case of medium holdings – by producers from the "Małopolska and Pogórze" region. However, entities from the "Wielkopolska and Śląsk" region faced a worse income situation in all economic classes. In terms of production types, horticultural, mixed and herbivore holdings from the "Wielkopolska and Śląsk" region enjoyed the best economic situation, while in the case of other groups – holdings from the "Pomorze and Mazury" region.

In all production types, farmers from other regions of the country, in particular the "Małopolska and Pogórze" region, achieved much lower income.

Figure 5.9. Rate of changes in agricultural holdings' income by regions in 2008-2012 (2004-2007 = 100, in %)

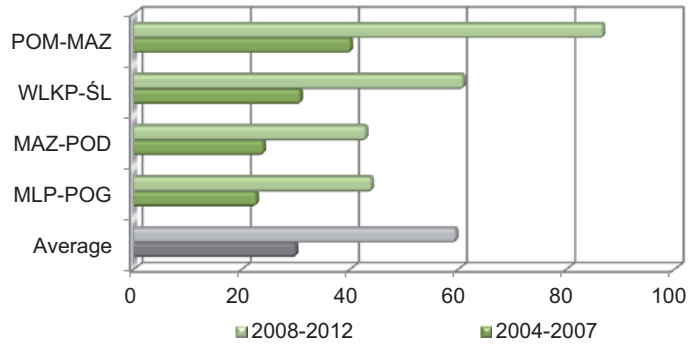


POM-MAZ – "Pomorze and Mazury" region, WKLP-ŚL – "Wielkopolska and Śląsk" region, MAZ-POD – "Mazowsze and Podlasie" region, MLP-POG – "Małopolska and Pogórze" region

Source: Own study based on FADN data.

A significant increase in the income-generating role of external support was also observed at the regional level. The lowest share of operating subsidies in agricultural holdings' income was reported in the "Małopolska and Pogórze" region, while in the central regions of the country – it was moderate. The highest level was observed in the "Pomorze and Mazury" region. Northern Poland was also characterised by the fastest growth in the income-generating role of direct support, which was significantly lower in other parts of the country (Figure 5.10).

Figure 5.10. Ratio of operating subsidies to income from a family agricultural holding (by regions, in %)



POM-MAZ – "Pomorze and Mazury" region, WKLP-ŚL – "Wielkopolska and Śląsk" region, MAZ-POD – "Mazowsze and Podlasie" region, MLP-POG – "Małopolska and Pogórze" region

Source: Own study based on FADN data.

In the early years of EU integration, there was a significant change in the economic situation of Polish agriculture, manifested, among others, in increased agricultural producers' income. The income situation of agricultural producers would not have been improved with no access to cash transfers paid to agriculture in the form of direct payments, market support for production activities, as well as structural funds.

Doubling farmers' real income in the post-accession period as a result of the implementation of CAP mechanisms improved their economic situation in terms of both incurring current expenditure and carrying out modernisation processes, which are to determine the structural and production economic situation of the Polish agricultural sector in the future.

Nonetheless, this better economic situation of Polish agriculture in the early years of integration does not mean that all agricultural holdings were able to generate income at the level of basic consumption funds or sufficient to engage in investment activities. Only economically strong entities with high production capacity enjoyed such ability. This means that EU support alone was not enough to overcome the effects of low production capacity, the efficiency and productivity of production factors [Poczta 2012, pp. 65-99].

Due to high agrarian fragmentation of the majority of Polish holdings, it can be concluded that direct subsidies have relatively little influence on the income situation of the agricultural sector. Owners of small holdings, which provide livelihoods for most of agricultural families, will increasingly be forced to undertake independent actions to improve their production capacity and efficiency, as well as to seek alternative sources of income. This means an increase in the importance of support for rural development, the activation of the rural population, creating new jobs outside agriculture and the development of small enterprises [Chmielewska 2007, p. 34].

5.2. Changes in the level of operating subsidies according to FADN data

In accordance with FADN methodology, the "operating subsidies" variable covered most categories of transfers of support for agricultural holdings under the CAP, excluding investment subsidies and payments for cessation of agricultural activity. Therefore, it should not be confused with commonly used formulations, in fact, not always properly used, such as direct subsidies, direct payments or direct support, which are de facto a part of it. For the purpose of the analyses conducted, the following abbreviated forms were applied: "subsidies", "payments" or "benefits".

The structure of subsidies was dominated by three types of support, i.e.: decoupled payments, payments for crop production and other payments which, in the abovementioned period, "absorbed" a large part of subsidies for crop production. The research shows that the level of cash inflows from direct support received by farmers depended mainly on the size of their holding. For this reason, there was a large

diversity in the level of benefits depending on the area of a holding, and thus its economic size. In 2008-2012, the annual level of subsidies in the FADN sample reached PLN 48.5 thousand per holding on average. In the smallest holdings, it was significantly below the average, while in medium-small ones – comparable. In large holdings, payments were significantly above the average, even 20-times higher in the largest ones (Table 5.1).

Table 5.1. Comparison of subsidies per holding to the average of the FADN sample by economic classes (average = 100)

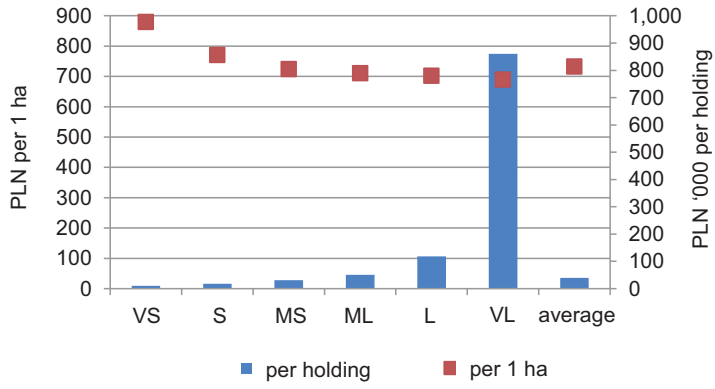
Years	VS	S	MS	ML	L	VL
2004	29.5	59.0	97.9	182.3	289.4	649.6
2005	29.9	49.4	90.1	143.2	323.0	2,011.9
2006	26.9	47.4	50.5	131.7	283.5	2,362.1
2007	33.1	48.7	80.2	132.2	335.8	1,954.6
2008	25.9	44.6	79.5	130.8	306.4	2,222.4
2009	24.4	41.9	77.1	126.2	295.1	2,428.7
2010	24.9	43.3	78.5	119.6	279.7	2,336.4
2011	22.1	44.2	77.1	122.7	308.1	2,215.7
2012	22.0	43.0	80.4	128.3	305.9	2,011.4

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

While the level of subsidy per holding is due to its size, the level of payment per 1 ha of arable land was correlated inversely. The largest holdings received lower support per 1 ha (Figure 5.11).

Figure 5.11. Average annual payment per holding and per 1 ha of arable land in 2004-2012 by FADN economic classes

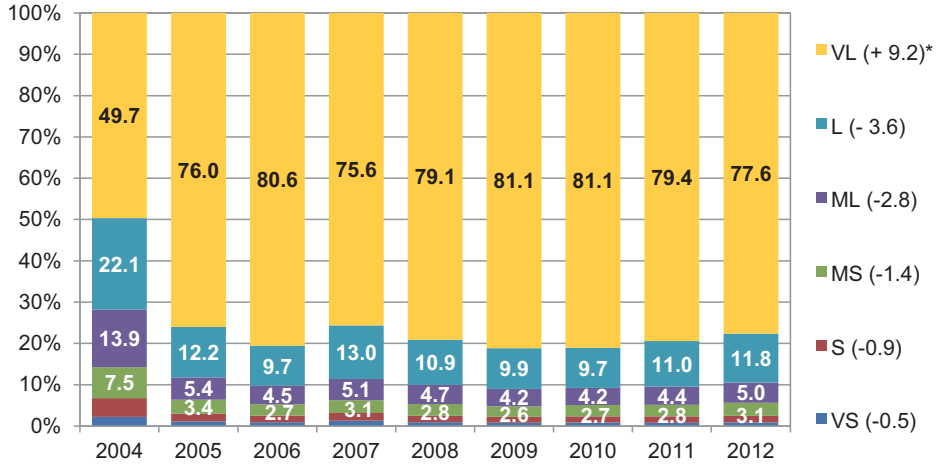


VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

Having analysed the distribution of payments between the holdings surveyed, it can be concluded that most of subsidies reached large and economically strong holdings closely related to the market. In dynamic terms, it is the share of entities from this group which increased, as opposed to the share of smaller units which decreased (Figure 5.12).

Figure 5.12. Distribution of operating subsidies by FADN economic classes



* Increase/decrease in the share (pp)

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

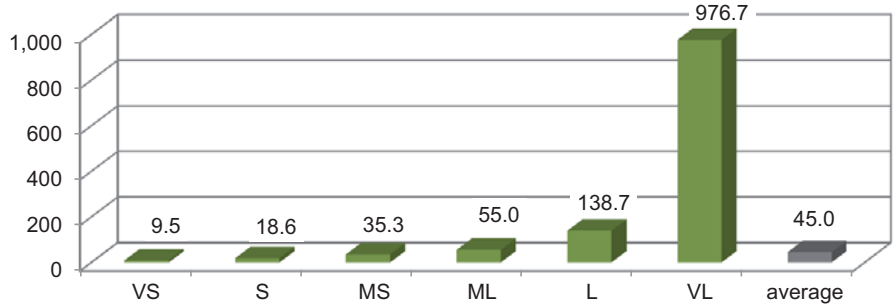
Source: Own calculations based on FADN data.

An increase in payment rates was mainly due to the conditions of reaching the full amount of CAP support. What is more, the zloty exchange rate against the euro was of great importance. In the early years of EU membership, a significant part of EUR rates was "absorbed" by the appreciation of the domestic currency.

On the one hand, the analysis of changes in the relative amount of payments revealed an increasing polarisation of proceeds therefrom and, on the other hand, the desire of holdings to maximise the amount of received support. This phenomenon was observed especially in the largest holdings, where the growth rate of subsidies was several times higher than the average (Figure 5.13).

The amount of payments in large holdings grew partly as a result of expanding the acreage. Choosing appropriate payment types was also important. Over time, farmers with large holdings started to adapt their production so as to get the highest proceeds per 1 ha on average thanks to the subsidies obtained.

Figure 5.13. Increase in the amount of subsidies per holding by FADN economic classes in 2004-2012 (nominally, in PLN '000; 2004 = 100)

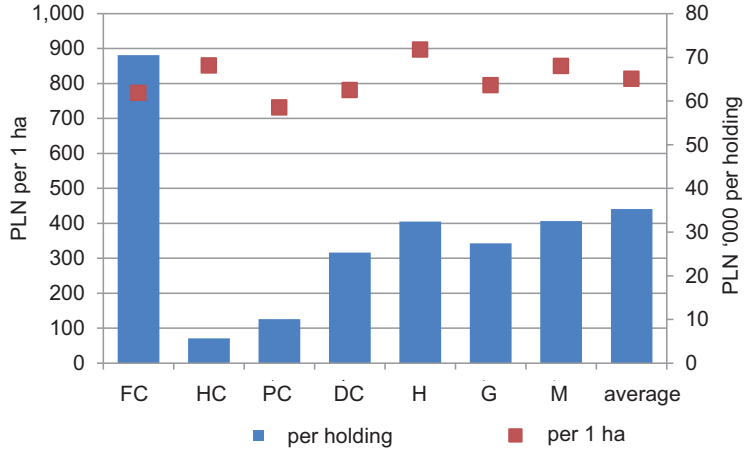


VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

Although the level of support to agricultural holdings did not directly result from a specific farming type, significant differences in the amount of received benefits were observed by production types. In the analysed period, the highest subsidies were granted to entities specialising in field crops, which resulted primarily from a much larger area of their arable land. However, the lowest benefits per holding were given to beneficiaries specialising in horticultural and orchard crops. Payments to holdings engaged mostly in mixed production, prevailing in more than half of the entities surveyed, were slightly below the average for the whole population (Figure 5.14).

Figure 5.14. Average annual payment per holding and per 1 ha of arable land in 2004-2012 by FADN production types

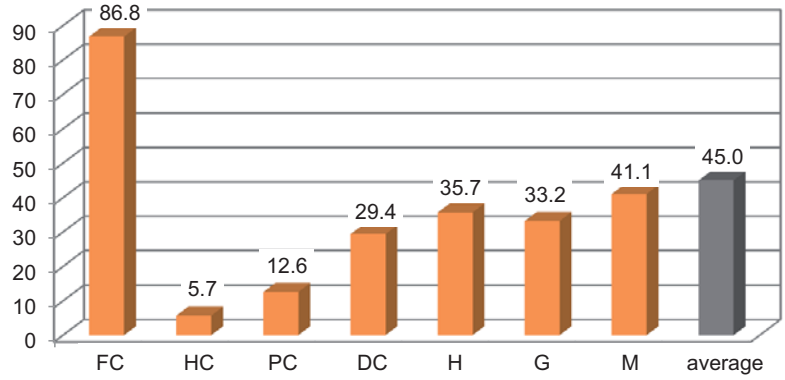


FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

In 2004-2012, in dynamic terms, the highest increase in the amount of subsidies was observed in field crop holdings, non-specialist holdings and herbivore holdings (Figure 5.15).

Figure 5.15. Increase in the amount of subsidies per holding by FADN production types in 2004-2012 (nominally, in PLN '000; 2004 = 100)



FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

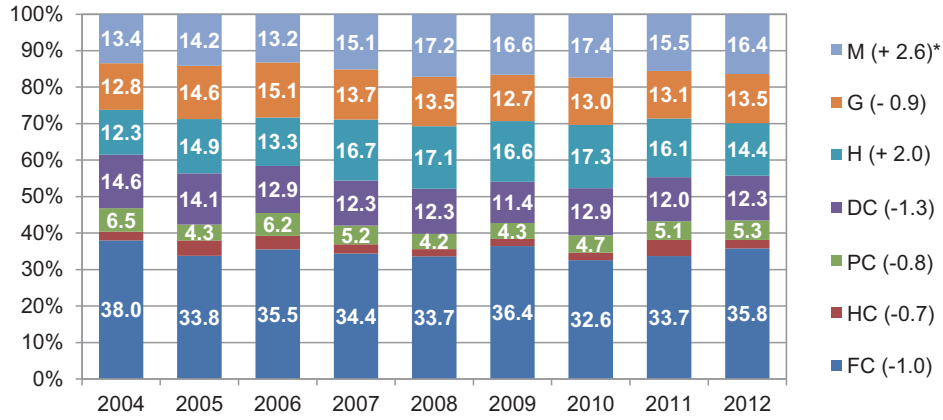
The average increase in the amount of subsidies in non-specialist and livestock units was greater than in other holdings primarily due to changes in the payment scheme. However, large, mostly vegetable, holdings benefiting from the economies of scale more than other units were often constrained from obtaining additional proceeds under direct support.

Changes in the amount of payments by production types were very hard to analyse due to changes made in the rules for their awarding, consisting mainly in the introduction of so-called fodder payments, livestock payments and other new forms of payment, e.g.: for soft fruit and tomatoes or papilionaceous plants. Nevertheless, the impact of CAP mechanisms on the production decisions of farmers was observed even in this approach, as evidenced by a shift from the activity conducted to a form allowing for increasing proceeds from direct payments under certain conditions and at a specific time.

The distribution of payments among various production types indicated that about 50% of subsidies were allocated to two groups of entities, i.e. to holdings specialising in field and mixed crops. Firstly, this situation was due to a high number of mixed production holdings; secondly, a large acreage of holdings specialising in field crops. The share of other production types was much smaller (Figure 5.16).

It can therefore be concluded that mainly the two most commonly occurring types of holdings benefited from EU support. This situation raises some doubts whether these funds are used effectively. Many mixed production holdings are small entities with no development opportunities in the long run. The relatively small amounts of support received by these holdings neither significantly improve their economic situation, nor contribute to a noticeable improvement in the material conditions of farming families.

Figure 5.16. Distribution of operating subsidies by FADN production types



FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

It is thus important to find other solutions to support activities of such holdings and to take the next step towards financial support for small-scale holdings while tightening or changing criteria, in order to provide assistance to those most in need. The criteria in this regard could be the following features, e.g. the regularity of sales in the market, the share of agricultural income, the age of managers (owners), development opportunities, etc. [Judzińska, Łopaciuk 2012, p. 24].

On a regional basis, the average amount of benefits per holding was also highly diverse. This was due to differences in both the agrarian structure throughout the country and production economic capacity of holdings from a specific region. In FADN regions characterised by a favourable agrarian structure and economically strong holdings, the average amounts of subsidies were significantly higher than in other parts of the country. For this reason, the scale of the impact of payments on agriculture was different in each region and changes observed across the country followed different patterns.

There is a clear dividing line reflecting the agrarian structure of Polish agricultural holdings. In the analysed period, the highest average subsidies were granted to beneficiaries from "Pomorze and Mazury" and "Wielkopolska and Śląsk" regions, while the lowest to those from "Mazowsze and Podlasie" and "Małopolska and

Pogórze" regions. Having analysed changes in the relative amount of subsidies in dynamic terms in the early years of membership, it was found that stratification between the regions with subsidies below the average for the entire population and those above the average in this respect, especially the "Pomorze and Mazury" region, deepens. However, this trend was halted in subsequent years (Table 5.2).

Table 5.2. Comparison of subsidies per holding to the average of the FADN sample by regions

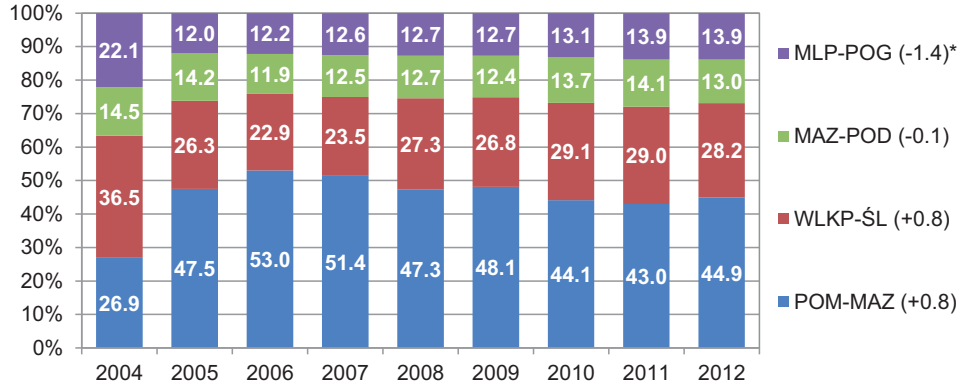
Years	POM-MAZ	WKLP-ŚL	MAZ-POD	MLP-POG
2004	110.0	149.2	59.1	90.3
2005	211.9	117.3	63.4	53.6
2006	250.1	108.0	56.3	57.6
2007	234.3	107.2	57.1	57.2
2008	203.9	117.8	54.9	54.8
2009	205.4	114.4	52.8	54.3
2010	183.1	120.7	56.7	54.5
2011	177.2	119.7	58.1	57.2
2012	188.6	118.3	54.6	58.4

POM-MAZ – "Pomorze and Mazury" region, WKLP-ŚL – "Wielkopolska and Śląsk" region, MAZ-POD – "Mazowsze and Podlasie" region, MLP-POG – "Małopolska and Pogórze" region

Source: Own calculations based on FADN data.

On a regional basis, there were also clear disparities in the distribution of payments between specific FADN regions. Over 70% of support goes to "Mazowsze and Podlasie" and "Wielkopolska and Śląsk" regions, and the remainder mostly to the "Pomorze and Mazury" region. These differences were mainly due to the number and size of holdings, almost half of which were located in the "Mazowsze and Podlasie" region (Figure 5.17).

Figure 5.17. Distribution of operating subsidies by FADN regions

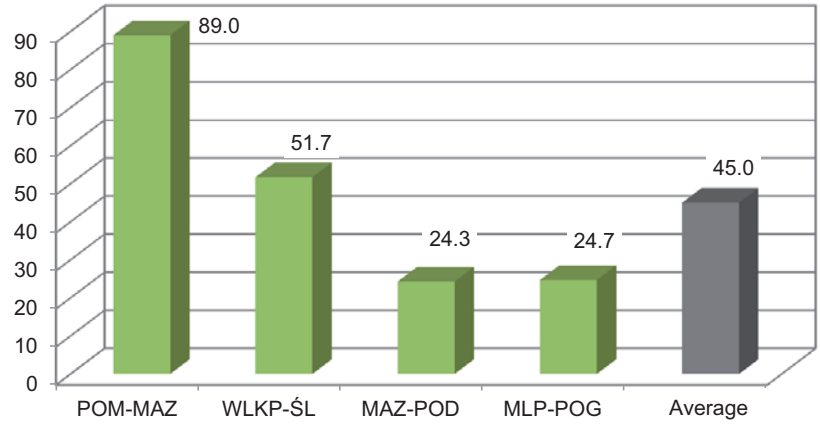


POM-MAZ – "Pomorze and Mazury" region, WKLP-ŚL – "Wielkopolska and Śląsk" region, MAZ-POD – "Mazowsze and Podlasie" region, MLP-POG – "Małopolska and Pogórze" region

Source: Own calculations based on FADN data.

In 2004-2012, the highest growth in the amount of subsidies (nominally) was noted in "Pomorze and Mazury" and "Wielkopolska and Śląsk" regions. In other regions, the growth rate was lower than the average by nearly half (Figure 5.18).

Figure 5.18. Increase in the amount of subsidies per holding by FADN regions in 2004-2012 (nominally, in PLN '000; 2004 = 100)



POM-MAZ – "Pomorze and Mazury" region, WKLP-ŚL – "Wielkopolska and Śląsk" region, MAZ-POD – "Mazowsze and Podlasie" region, MLP-POG – "Małopolska and Pogórze" region

Source: Own calculations based on FADN data.

Regional differences in the amount of subsidies and the dynamics of their changes could be observed also in holdings by both individual economic size classes and production types. In all economic classes, the holdings from the "Pomorze and Mazury" region secured the highest level of support. Its average value was higher than both the amount of subsidies in other regions and the average of the FADN field of observation. Proceeds at such a high level resulted primarily from the largest acreage of arable land and relatively high economic power of holdings in this part of Poland. Nonetheless, these entities were characterised by the slowest rate of growth in the amount of subsidies per holding throughout the period analysed. The amount of support and its growth rate were the closest to the average in the "Wielkopolska and Śląsk" region. However, the amount of benefits in the south-eastern regions of Poland was below the average for the population surveyed, especially in the "Małopolska and Pogórze" region. Nevertheless, in dynamic terms, the highest growth rate of external support was recorded in eastern Poland (Table 5.3).

Of all holdings grouped by production types, similarly as when grouped by economic size classes, the highest operating subsidies were granted to beneficiaries from the "Pomorze and Mazury" region, while the lowest to those from the "Małopolska

and Pogórze" region. This shows that the amount of obtained support bears relatively little relation to the main direction of production. Economic size and acreage of arable land of holdings from different FADN regions had much more bearing on the amount of support. The only exception was the situation of horticultural holdings whose owners secured the highest benefits in "Mazowsze and Podlasie", i.e. the region with the largest number of entities of this production profile.

Table 5.3. Rate of changes in the amount of subsidies in specific FADN regions by economic classes
(2008-2012 average vs. 2004-2007 average, in %)

Specification	POM-MAZ	WLKP-ŚL	MAZ-POD	MLP-POG	Average
VS	106.2	120.3	93.3	122.0	106.1
S	130.3	126.6	118.6	117.6	128.1
MS	131.8	152.4	127.0	137.9	141.5
ML	118.6	144.0	128.7	154.8	134.3
L	161.0	143.0	196.9	143.7	149.4
VL	133.8	244.1	.	.	184.3

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

POM-MAZ – "Pomorze and Mazury" region, WKLP-ŚL – "Wielkopolska and Śląsk" region, MAZ-POD – "Mazowsze and Podlasie" region, MLP-POG – "Małopolska and Pogórze" region

Source: Own calculations based on FADN data.

In dynamic terms, in all groups of holdings, excluding those engaged in milk production, the amounts of support grew most slowly in "Pomorze and Mazury" and "Małopolska and Pogórze" regions (Table 5.4).

Table 5.4. Rate of changes in the amount of subsidies in specific FADN regions by production types
(2008-2012 average vs. 2004-2007 average, in %)

Specification	POM-MAZ	WLKP-ŚL	MAZ-POD	MLP-POG	Average
FC	102.6	128.0	181.0	173.6	133.6
HC	114.4	130.2	72.5	10.7	84.6
PC	86.2	128.3	119.2	54.1	106.6
DC	96.6	148.2	106.8	117.8	120.3
H	175.8	85.0	180.2	140.3	163.7
G	103.7	122.1	123.5	105.2	116.4
M	111.9	200.6	159.9	138.2	179.8

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

POM-MAZ – "Pomorze and Mazury" region, WKLP-ŚL – "Wielkopolska and Śląsk" region, MAZ-POD – "Mazowsze and Podlasie" region, MLP-POG – "Małopolska and Pogórze" region

Source: Own calculations based on FADN data.

There were significant regional differences in the distribution of payments between holdings grouped by both economic size and production profile. In this perspective, the vast majority of subsidies in total were directed to holdings from the "Mazowsze and Podlasie" region and, to a lesser extent, to entities from the "Wielkopolska and Śląsk" region. In contrast, the smallest amount of benefits went to holdings from southern Poland. These differences arose from the uneven distribution of the number of holdings across FADN regions, as well as from differences in their size and acreage.

By analysing the distribution of subsidies between agricultural holdings from individual FADN regions, it can be concluded that the direct payment scheme in its current form supports mainly large agricultural producers. The vast majority of subsidies in total went to the largest and economically strong holdings enjoying development opportunities. Market supply of both primary agricultural and food products will increasingly depend on these entities, which are about to mark out the future of Polish agriculture in the international market [Judzińska, Łopaciuk 2012, pp. 103-104].

The situation is different in the case of the smallest agricultural holdings, i.e. economically weak entities with no development and investment opportunities. This group of holdings does not introduce major production changes, thus not adjusting its activity to changing market conditions or adjusting it on a very limited basis. Access to external support cannot therefore improve their weak position in the food chain, which in part contributes to the development of an unfavourable agrarian structure across Polish rural areas. A possible exclusion of economically weakest entities from the direct support scheme should be directly accompanied by alternative agricultural and social policy instruments, which will be tailored to the needs and significance of these holdings in domestic agriculture [Wrutniak 2010, p. 18].

Having analysed the distribution of subsidies between holdings by their production types, it can be stated that the EU support scheme, including in particular access to complementary payments, favours holdings engaged in intensive crop production, achieving high grain yields and involved in intensive herbivore breeding [Kisiel, Babuchowska, Marks-Bielska 2012, p. 133].

Bearing in mind that systematic improvement in the competitiveness of the agricultural sector is one of the main objectives of the CAP, it is advisable to create a support scheme, which would ensure that funds are provided primarily to holdings with development opportunities demonstrating, among others: high-scale commercial production, management efficiency, creditworthiness and investment activity [Kisiel, Babuchowska, Marks-Bielska 2012, p. 168].

A fair distribution of funds to support agricultural holdings across specific regions of the country is also an important issue. Such distribution should equalise their competitiveness in both national and international market. Therefore, solutions proposed for the next programming period should be adjusted to a greater extent to the

specifics of different regions of Poland. These changes should take account of not only general differences between the regions, but also their characteristic features, such as: level of infrastructure, natural conditions, main directions of production, general level of economic development [Judzińska, Łopaciuk 2013, p. 76].

5.3. Changes in the value and structure of agricultural production

In 2004-2009, the area of arable land of FADN holdings decreased slightly, while the acreage of leases increased. The acreage of grains and permanent crops dropped as well. There was a large decline in the acreage of land taken out of production, including set-aside areas. However, the area of forage crops, other field crops, vegetables and flowers increased.

As regards the structure of arable land of the holdings surveyed, the share of grains and land taken out of production decreased, while forage crops and, to a much lesser extent, field crops, vegetables and flowers gained in importance. In terms of economic classes, as regards the structure of arable land of the largest holdings, forage crops and other field crops grew in importance, as opposed to the share of grains which dropped significantly. Small holdings reported a significant increase in the importance of vegetables and flowers. However, the decline in the share of land taken out of production was observed mainly in small and medium holdings (Table 5.5). In subsequent years, most of these trends continued. However, the acreage of arable land in 2008-2012 increased in relation to 2004-2007, mainly due to an increase in the acreage of grains. The area of land taken out of production rose as well (Table 5.6).

Table 5.5. Changes in the acreage of arable land and selected crops according to FADN data, by economic classes (2007-2009 average vs. 2004-2006 average, in %)

Specification	Average	VS	S	MS	ML	L	VL
UAA	-0.7	-0.2	5.2	-1.9	3.7	8.8	13.7
Rented land	3.6	4.8	1.0	-3.7	4.7	2.1	21.7
Cereals	-3.1	-0.2	4.8	-2.7	-0.3	0.0	4.8
Other field crops	1.7	-14.9	-0.9	-8.7	9.4	28.8	19.8
Vegetables and flowers	12.3	91.0	43.8	2.2	-9.2	-40.6	37.7
Permanent crops	-0.5	-5.3	6.6	1.1	-1.3	34.7	116.8
incl.: orchards	-1.2	-6.2	6.1	1.0	-2.8	33.8	149.4
other	47.8	156.7	126.3	14.5	54.5	41.1	-1.9
Feed crops	11.3	7.3	7.3	10.8	20.3	53.5	56.3
UAA excl. from production	-57.0	-48.7	-48.7	-68.1	-59.0	-51.1	-23.8
Forests	5.9	-5.0	16.2	4.5	15.6	21.2	36.2

UAA – Utilised Agricultural Area

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

Table 5.6. Changes in the acreage of arable land and selected crops according to FADN data, by economic classes (2008-2012 average vs. 2004-2007 average, in %)

Specification	Average	VS	S	MS	ML	L	VL
UAA	16.9	18.0	15.2	16.2	12.1	20.8	16.7
Rented land	15.4	24.2	22.5	24.9	9.9	11.6	15.7
Cereals	7.3	23.9	17.9	13.9	3.6	15.7	5.7
Other field crops	9.9	19.0	26.5	36.4	23.0	32.1	6.7
Vegetables and flowers	7.3	-42.2	-25.5	-19.1	3.0	-4.1	31.3
Permanent crops	103.5	-7.2	21.9	13.2	18.2	124.8	179.5
incl.: orchards	116.7	-7.6	21.7	11.3	18.7	161.2	215.4
other	-10.5	248.9	144.9	209.3	8.4	4.7	-21.8
Feed crops	78.4	29.7	12.2	18.3	36.7	32.4	95.7
UAA excl. from production	7.4	-6.0	-34.8	-44.4	-31.6	-18.4	16.7
Forests	22.0	10.4	8.2	12.3	24.4	45.2	21.6

UAA – Utilised Agricultural Area

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

Just after the EU accession, agricultural holdings focused on enlarging their acreage for various reasons, of which area payments proved to be the most important. Market factors also played an important role in this respect, making certain groups of holdings develop their production more than other holdings (including those specialising in milk and beef cattle production), which involved an additional area of arable land. Market factors also contributed to a reduction in the acreage of grains and, in recent years, to its increase. This phenomenon was first observed especially in holdings specialising in crop production, whose interest in other field crops (including rape) grew, and livestock holdings that were expanding their acreage of forage crops in order to secure production of their own fodder. In good economic times, this trend was especially easy to notice in smaller holdings, which are more sensitive to short-term changes in market conditions.

An increased interest in permanent crops, especially in holdings with different specialisation, was due to the adjustment of their acreage so as to obtain CAP payments, just like a reduction in land taken out of production, which was necessary to enlarge the area applicable for direct payments (Table 5.7, 5.8).

Table 5.7. Changes in the acreage of arable land and selected crops according to FADN data, by production types (2007-2009 average vs. 2004-2006 average, in %)

Specification	FC	HC	PC	DC	H	G	M
UAA	-5.3	13.7	-0.2	9.3	9.2	-5.5	-3.0
Rented land	-5.6	64.9	74.5	19.0	34.7	-9.5	0.0
Cereals	-7.8	11.5	27.5	15.3	6.9	-4.6	-4.8
Other field crops	5.3	-13.0	31.5	-19.4	1.5	2.1	-12.7
Vegetables and flowers	-0.9	80.9	14.4	79.1	16.4	75.4	2.1
Permanent crops	-0.3	40.4	-4.3	5.0	7.3	-19.8	-9.5
incl.: orchards	-1.6	40.9	-4.9	5.0	7.3	-19.8	-9.5
other	88.7	-98.0	28.2	-	-	-	-61.0
Feed crops	-9.3	0.5	-16.4	16.1	17.5	20.8	14.6
UAA excl. from production	-34.2	-29.6	-7.0	-87.8	-82.0	-36.0	-63.6
Forests	11.1	55.2	-4.2	2.7	6.3	-10.4	5.7

UAA – Utilised Agricultural Area

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

Table 5.8. Changes in the acreage of arable land and selected crops according to FADN data, by production types (2008-2012 average vs. 2004-2007 average, in %)

Specification	FC	HC	PC	DC	H	G	M
UAA	6.1	5.6	20.4	16.9	46.1	7.5	33.7
Rented land	-7.3	26.6	61.5	32.2	99.2	-14.7	63.0
Cereals	5.9	4.4	4.6	17.7	36.8	5.3	28.9
Other field crops	12.6	-6.5	40.0	41.0	74.1	27.3	40.8
Vegetables and flowers	-36.5	36.1	-29.7	-37.8	30.8	-19.3	-8.0
Permanent crops	-19.5	-9.5	22.5	115.2	164.2	45.2	43.4
incl.: orchards	-23.0	3.8	22.1	115.2	162.4	45.2	36.8
other	98.3	-27.7	.	.	.	.	458.8
Feed crops	6.1	23.1	26.5	19.4	56.5	5.4	50.3
UAA excl. from production	-17.2	-26.6	91.1	-74.5	-64.4	5.4	-5.2
Forests	41.4	39.6	33.1	33.1	60.6	42.1	14.3

UAA – Utilised Agricultural Area

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

As regards the population of FADN holdings, the share of grains, land taken out of production, set-aside areas and fallow land in the structure of arable land decreased until 2009. However, the share of forage crops and, to a minimal extent, other field crops, vegetables and flowers grew. In terms of economic classes, as regards the structure of arable land, the share of grains decreased mainly in the largest holdings, being replaced by forage crops and other field crops. Nevertheless, while the share of the former increased in all economic classes, the share of the latter rose only in large holdings and dropped in smaller ones. The share of vegetables and flowers grew primarily

in small holdings and decreased slightly in larger ones. The share of land taken out of production declined mainly in small and medium holdings (Table 5.9).

Table 5.9. Changes in the structure of arable land
according to FADN data, by economic classes
(2008-2009 average vs. 2004-2006 average, in percentage points)

Specification	Average	VS	S	MS	ML	L	VL
Cereals	-1.5	0.0	-0.3	-0.5	-2.4	-5.5	-4.8
Other field crops	0.3	-1.3	-0.5	-0.8	0.7	3.1	1.6
Vegetables and flowers	0.2	1.3	0.6	0.1	-0.2	-0.9	-0.5
Permanent crops	0.0	-0.1	0.0	0.1	-0.1	0.3	0.3
incl.: orchards	0.0	-0.2	0.0	0.1	-0.1	0.2	0.3
Feed crops	2.5	1.9	2.1	2.9	3.1	4.1	3.8
UAA excl. from production	-1.3	-1.5	-1.7	-1.5	-1.0	-1.0	-0.4

UAA – Utilised Agricultural Area

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

Table 5.10. Changes in the structure of arable land
according to FADN data, by economic classes
(2008-2012 average vs. 2004-2007 average, in percentage points)

Specification	Average	VS	S	MS	ML	L	VL
Cereals	-1.6	3.1	1.4	-1.1	-4.8	-2.9	-5.4
Other field crops	0.8	0.1	1.1	2.3	1.5	2.1	-2.4
Vegetables and flowers	-0.9	-3.2	-1.1	-0.5	-0.1	-0.2	0.0
Permanent crops	0.0	-1.0	0.2	0.0	0.0	0.4	0.3
incl.: orchards	0.0	-1.0	0.2	-0.1	0.0	0.4	0.3
Feed crops	2.3	1.6	-0.6	0.4	3.8	1.1	7.5
UAA excl. from production	-0.5	-0.5	-0.9	-0.8	-0.5	-0.5	0.1

UAA – Utilised Agricultural Area

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

In 2004-2009, as regards production types, grains and other field crops declined in importance in both holdings specialising in herbivore and granivore production and mixed production holdings (i.e. those engaged also in livestock production). In holdings using large amounts of roughage (other grazing livestock and mixed livestock), grains lost their importance in favour of forage crops. The share of grains also dropped in holdings specialising in crop production, giving way to other field crops, i.e. mainly rape. Dairy holdings to some extent shifted from other field crops to grains and forage crops. As regards orchard holdings, the share of permanent crops decreased in favour of grains. Horticultural holdings experienced an increase in the share of vegetables and flowers at the expense of non-horticultural crops.

Just after the EU accession, holdings were interested in enlarging their acreage for various reasons, of which area payments seem to be the most important. Market factors also played an important role in this respect, making certain groups of holdings

develop their production more than other holdings (those specialising in milk and beef cattle production), which involved an additional area of arable land. Market factors also contributed to a reduction in the acreage of grains. This situation was observed especially in holdings specialising in crop production, whose interest in other field crops (rape) grew, and livestock holdings that expanded their acreage of forage crops in order to secure production of their own fodder, mainly roughage. An increased interest in permanent crops, especially in holdings with different specialisation, was due to the adjustment of their acreage so as to obtain CAP payments, just like a reduction in land taken out of production, which was necessary to enlarge the area applicable for direct payments.

Table 5.11. Changes in the structure of arable land according to FADN data, by production types (2007-2009 average vs. 2004-2006 average, in percentage points)

Specification	FC	HC	PC	DC	H	G	M
Cereals	-1.7	-0.8	3.2	1.9	-0.8	-3.1	-2.5
Other field crops	2.3	-2.0	0.8	-0.9	-0.3	-0.3	-1.3
Vegetables and flowers	0.2	7.5	0.3	0.1	0.0	0.2	0.0
Permanent crops	0.1	1.0	-3.0	0.0	0.0	0.0	0.0
incl.: orchards	0.1	1.0	-3.4	0.0	0.0	0.0	0.0
Feed crops	-0.4	-1.8	-0.9	3.4	4.3	-1.4	3.1
UAA excl. from production	-0.5	-4.1	-0.2	-3.8	-2.7	-0.6	-1.3

UAA – Utilised Agricultural Area

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

In the current decade, most of the trends observed in 2004-2009 have continued. However, as regards holdings specialising in dairy cow production and permanent crops, grains have declined in importance in favour of other field crops and forage crops (Table 5.12).

Table 5.12. Changes in the structure of arable land according to FADN data, by production types (2008-2012 average vs. 2004-2007 average, in percentage points)

Specification	FC	HC	PC	DC	H	G	M
Cereals	-0.2	-0.4	-1.3	0.3	-2.3	-1.8	-2.3
Other field crops	1.7	-1.0	0.3	0.8	0.7	2.1	1.0
Vegetables and flowers	-1.2	4.0	-1.5	-0.1	0.0	-0.1	-0.4
Permanent crops	0.0	-1.7	1.3	0.0	0.0	0.0	0.1
incl.: orchards	0.0	-0.1	1.1	0.0	0.0	0.0	0.0
Feed crops	0.0	1.7	0.2	1.2	4.2	-0.2	2.1
UAA excl. from production	-0.3	-2.5	1.0	-1.9	-2.3	-0.1	-0.4

UAA – Utilised Agricultural Area

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

In most holdings, in the structure of total production (in value terms), crop production, including mainly grains, oilseeds (rape) and forage crops, gained in importance which, in addition to changes in the structure of production, resulted in price changes. However, the share of root crops (especially sugar beet) and horticultural products dropped.

Changes in crop production resulted from numerous causes. Market factors, such as the demand for a given product and sales prices played the main role in this respect. A large increase in grain prices was of major importance, indirectly affecting other directions of agricultural production, not only plant production. Therefore, despite the share of grains in the structure of arable land dropped, their importance in the structure of agricultural production increased. Due to favourable prices, the share of oilseeds, including mainly rape, also grew, while limited sales opportunities and relatively low prices contributed to limiting the cultivation of potatoes. Changes in the structure of crop production were also influenced by CAP mechanisms. The reform of the sugar market regulation undoubtedly contributed to a strong reduction in the cultivation of sugar beet, while the growing importance of forage crops was in part due to the development of livestock production (including dairy cow and beef cattle breeding) eligible for livestock payments.

Just after the EU accession, most sectors of livestock production saw a regression. In 2004-2009, the general size of livestock in FADN holdings decreased by over 10% on average, which resulted primarily from a reduction in the stock of swine and, to a lesser extent, poultry and dairy cows. The stock of other cattle (beef cattle) increased significantly and so did, to a lesser extent, the population of sheep and goats. Mainly large holdings reduced the general size of livestock as a result of the reduction in the stock of swine and poultry, which was not compensated by an increase in the level of other livestock. Small and medium holdings increased their stock of beef cattle, sheep and goats, while the smallest ones – of poultry, too.

Changes in the size of livestock were mostly related to specialisation and concentration processes taking place especially in large holdings. Many of them ceased their livestock production (mostly swine holdings), while others, i.e. those which chose not to do so and to develop in this area, specialised in specific fields, such as dairy cattle and beef cattle. This situation was due to structural and market factors. Large holdings with relatively lower labour resources limited their interest in labour-intensive activities, i.e. livestock production. High prices of grains and fodder, which are essential in granivore (swine and poultry) production, contributed to a loss of interest in this area. In turn, the increased interest in milk production can be explained by high, despite large fluctuations, milk prices in the second half of the analysed period (Table 5.13).

Table 5.13. Changes in the size of livestock*
according to FADN data, by economic classes
(2007-2009 average vs. 2004-2009 average, in %)

Specification	Average	VS	S	MS	ML	L	VL
Total livestock	-10.5	1.8	1.1	-5.5	-5.9	-14.8	-11.5
Milk cows	-8.3	-4.1	-10.8	-10.2	6.2	49.5	42.5
Other cattle	23.9	43.6	50.3	19.8	24.8	56.7	43.8
Sheep and goats	4.0	-31.8	3.1	84.6	42.0	80.7	32.6
Swine	22.1	-19.4	-8.6	-15.7	-15.3	-21.6	30.1
Poultry	13.2	47.2	-5.2	2.2	-27.0	-51.0	-1.2

* in livestock units

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

In the current decade, changes in livestock production have followed closely those of 2004-2009. However, the rate of changes has intensified in the largest holdings – a drop in the stock of swine and poultry, as well as a growth in the population of dairy cows and other livestock (Table 5.14).

Table 5.14. Changes in the size of livestock*
according to FADN data, by economic classes
(2008-2012 average vs. 2004-2007 average, in %)

Specification	Average	VS	S	MS	ML	L	VL
Total livestock	-14.1	-0.7	-7.2	-4.4	-0.8	-9.8	-16.0
Milk cows	75.7	-21.3	-14.8	2.3	29.2	21.3	103.8
Other cattle	76.8	49.5	30.4	30.6	49.0	33.0	90.4
Sheep and goats	97.3	8.5	-17.2	144.2	-35.9	-20.5	159.2
Swine	-36.2	-9.2	-20.3	-24.1	-18.2	-8.1	-41.5
Poultry	-38.7	19.1	28.5	-17.0	-36.0	-41.2	-38.4

* in livestock units

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

In 2004-2009, as regards production types, the highest reduction in the size of livestock was observed in holdings specialising in granivore production and non-specialist holdings and, to a lesser extent, those engaged in crop production. In contrast, the largest growth in the size of livestock occurred in holdings where livestock played a negligible role (horticultural and orchard holdings). The stock of dairy cattle grew the most in horticultural holdings. A smaller growth was observed in dairy and orchard holdings, while other types of holdings saw a decline in this regard. The population of other cattle (beef cattle) increased similarly, but this time the increase was observed in all types of holdings. Most of them reduced the stock of swine, including mostly dairy and herbivore holdings, which also reduced the size of their poultry flock the most. However, its size grew in orchard holdings and those specialising in field

and mixed crops. In subsequent years, similar changes were observed (Table 5.15, 5.16). Only mixed production holdings reported an increase in the stock of all species.

Table 5.15. Changes in the size of livestock* according to FADN data, by production types (2007-2009 average vs. 2004-2009 average, in %)

Specification	FC	HC	PC	DC	H	G	M
Total livestock	-4.0	42.2	57.8	12.9	60.4	-7.8	-9.5
Milk cows	-10.1	31.2	9.2	11.1	-0.6	-25.4	-16.0
Other cattle	29.4	106.5	123.2	29.7	24.2	24.0	21.2
Sheep and goats	-29.7	-83.4	-11.4	-84.6	5.3	3.7	21.5
Swine	-15.8	38.1	33.1	-35.5	-42.1	-9.9	-19.9
Poultry	11.2	0.6	93.7	-43.2	-25.8	-2.5	11.2

* in livestock units

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

Table 5.16. Changes in the size of livestock* according to FADN data, by production types (2007-2009 average vs. 2004-2009 average, in %)

Specification	FC	HC	PC	DC	H	G	M
Total livestock	-28.6	11.4	43.1	21.4	33.6	-3.8	18.1
Milk cows	-39.2	14.6	9.1	18.7	14.4	-38.2	16.2
Other cattle	-7.5	42.8	136.6	35.9	63.6	36.8	56.5
Sheep and goats	-29.2	-92.4	.	.	-27.9	-34.8	30.7
Swine	-35.1	-3.8	61.8	-44.0	-45.0	-0.4	4.9
Poultry	-48.7	146.3	-30.6	-48.5	-56.6	-18.6	30.6

* in livestock units

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

Having analysed changes in the size of livestock, it can be concluded that most of the types of holdings with clearly defined main activity, on the one hand, pursued and continue to pursue their specialisation and, on the other hand, diversify their profile by increasing the scale of non-core activities or introducing them. The scale of changes in the size of livestock in various production types was similar to those observed in economic classes. A huge drop in the stock of swine in mixed production holdings and others with different specialisation indicates the impact of market factors. As a result of rising production costs (higher prices of grains and industrial fodder), the stock of swine had to be reduced or given up by farmers with higher production costs and no opportunity to reduce them. In this perspective, the CAP impact was also reflected in an increase in the stock of other cattle (beef cattle), subsidised with suckler cow premium.

Changes in the structure of inventory resulted from changes in the size of livestock. In the entire FADN sample, there was an decrease in the share of swine and, to a lesser extent, poultry in favour of beef cattle and dairy cows. The greatest reduction in the share of swine and a growth in the population of dairy cows were observed in large holdings. The share of beef cattle grew in all economic classes, particularly in small holdings. Moreover, the smallest holdings reported an increase in the share of poultry. In recent years, these trends have continued. The only exception was the situation of the largest holdings which noted a decline in this regard (Table 5.17, 5.18).

Table 5.17. Changes in the structure of livestock herds* according to FADN data, by economic classes (2007-2009 average vs. 2004-2009 average, in percentage points)

Specification	Average	VS	S	MS	ML	L	VL
Milk cows	0.5	1.7	-3.4	-1.4	2.7	6.2	7.0
Other cattle	5.7	6.6	7.8	4.8	4.7	5.5	6.2
Sheep and goats	0.1	1.0	0.0	0.3	0.1	0.1	0.1
Swine	-6.5	-7.8	-4.0	-4.7	-5.4	-5.7	-15.0
Poultry	-0.3	4.0	-0.6	0.7	-2.1	-6.2	0.3

* in livestock units

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

Table 5.18. Changes in the structure of livestock herds* according to FADN data, by economic classes (2008-2012 average vs. 2004-2007 average, in percentage points)

Specification	Average	VS	S	MS	ML	L	VL
Milk cows	-2.4	-6.1	-2.8	2.2	5.9	3.0	-16.6
Other cattle	4.7	9.5	8.4	7.2	6.8	3.1	-6.6
Sheep and goats	0.1	0.1	-0.1	0.3	-0.1	0.0	0.2
Swine	-7.6	-3.9	-5.9	-9.5	-10.7	1.1	-16.6
Poultry	-2.6	0.4	0.4	-0.2	-1.8	-7.5	-6.6

* in livestock units

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

In 2004-2009, as regards the structure of livestock by production types, the share of cows grew only in dairy holdings, following a downward trend in other production types, especially in orchard holdings. Regardless of the field of specialisation, the share of other cattle (beef cattle) increased in all groups of holdings, particularly in holdings specialising in crop production, horticulture and those of mixed production profile. The share of swine grew only in holdings specialising in their production, while the share of poultry dropped in horticultural holdings. In contrast, poultry gained in importance in both holdings specialising in its production and orchard holdings.

Table 5.19. Changes in the structure of livestock*
according to FADN data, by production types
(2007-2009 average vs. 2004-2009 average, in percentage points)

Specification	FC	HC	PC	DC	H	G	M
Milk cows	-1.3	-2.6	-6.2	1.1	-3.7	-0.4	-1.5
Other cattle	7.1	6.5	4.8	3.1	5.6	1.4	6.3
Sheep and goats	-0.7	-4.6	-0.8	-0.2	0.0	0.0	0.2
Swine	-6.0	-0.8	-1.3	-1.2	-2.2	2.0	-5.3
Poultry	0.8	-1.8	6.1	-0.1	-0.1	7.7	0.7

* in livestock units

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

Table 5.20. Changes in the structure of livestock*
according to FADN data, by production types
(2008-2012 average vs. 2004-2007 average, in percentage points)

Specification	FC	HC	PC	DC	H	G	M
Milk cows	-2.6	3.1	-6.1	-1.5	-4.8	-0.2	-0.4
Other cattle	7.9	2.9	6.2	3.6	11.1	0.4	6.3
Sheep and goats	0.0	-0.8	3.1	0.0	-2.5	0.0	0.0
Swine	-4.6	-6.1	7.1	-2.0	-3.3	3.2	-6.3
Poultry	-1.0	0.8	-1.0	0.0	-0.2	-3.3	0.2

* in livestock units

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

The phenomena observed are confirmed by changes in the structure of livestock production (in value terms). In the analysed period, the holdings surveyed reported a decline in the share of pork production and, to a minimal extent, egg production, while the share of beef, poultry and milk rose slightly.

The largest decline in livestock production was observed in large holdings, while an increase was reported only by the smallest entities. In all economic classes, the share of beef grew slightly, while that of pork declined significantly. Most of holdings also reported a slight drop in the share of eggs. On a regional basis, the share of livestock production in total agricultural production in most parts of the country markedly decreased as well, especially in the "Pomorze and Mazury" region. In contrast, a slight increase in this share was observed only in the "Mazowsze and Podlasie" region.

In 2004-2009, the value of agricultural production in the holdings surveyed grew by nearly 6% on average. This was partly due to a significant increase in the value of crop production, while the value of livestock production rose only slightly. The increased value of crop production resulted from a relatively large increase in crop prices. However, the value of livestock production grew as a result of a significant

improvement in its productivity and efficiency. In terms of economic classes, a strong polarisation of the agricultural production growth was observed – the highest growth was observed in the smallest (very small and small) and largest (very large) holdings, while the lowest – in medium entities (Table 5.21).

Table 5.21. Changes in the value of crop and livestock production and selected indicators according to FADN data, by economic classes (2007-2009 average vs. 2004-2009 average, in %)

Specification	Average	VS	S	MS	ML	L	VL
Total output	5.8	24.4	16.1	4.8	3.5	-1.6	21.6
Crop production	10.3	19.6	20.8	6.2	3.4	2.5	36.9
Crop production per 1 ha	5.0	13.5	7.9	-2.4	-21.3	-33.5	24.4
Wheat yield	1.4	-2.4	0.6	-0.2	1.2	2.2	0.8
Maize (corn) yield	28.0	21.5	17.0	20.9	24.5	16.6	40.9
Livestock production	0.9	30.6	11.4	32.0	3.4	-7.3	4.0
Livestock production per LU	17.2	29.7	4.1	7.9	9.5	8.7	27.9
Milk yield per cow	6.9	-1.0	0.4	0.1	4.5	4.1	17.6

LU – livestock unit

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

Table 5.22. Changes in the value of crop and livestock production and selected indicators according to FADN data, by economic classes (2008-2012 average vs. 2004-2007 average, in %)

Specification	Average	VS	S	MS	ML	L	VL
Total output	29.1	13.5	23.6	27.4	25.3	28.1	29.7
Crop production	45.4	12.4	33.5	41.0	27.8	47.1	46.7
Crop production per 1 ha	16.0	-4.0	16.5	21.7	14.2	22.5	27.3
Wheat yield	3.2	0.5	4.0	4.3	4.2	4.3	1.4
Maize (corn) yield	22.9	23.3	20.7	17.9	16.8	25.1	34.9
Livestock production	12.7	14.2	7.2	14.6	23.1	9.2	12.7
Livestock production per LU	22.6	15.0	15.6	19.9	23.9	21.4	37.2
Milk yield per cow	9.4	-2.6	0.4	6.5	8.6	9.5	23.0

LU – livestock unit

VS – very small, S – small, MS – medium-small, ML – medium-large, L – large, VL – very large

Source: Own calculations based on FADN data.

The current decade has brought changes in this regard. However, they resulted from changes in prices of agricultural products, particularly grains. This was primarily evident in holdings producing mainly grains, i.e. large units benefiting from the economies of scale.

On a regional basis, changes in livestock breeding were mainly driven by structural factors. The size of livestock decreased throughout the country. The largest drop was recorded in "Małopolska and Pogórze" and "Pomorze and Mazury" regions (about 16-18%), while the lowest – in the "Wielkopolska and Śląsk" region. In the analysed

period, only the size of other cattle (beef cattle) followed an upward trend throughout the regions of the country. The greatest decline in the stock of swine (25-20%), poultry (15-25%) and dairy cows (9-14%) was observed in "Małopolska and Pogórze" and "Pomorze and Mazury" regions. Large holdings from the latter region, which had been often established based on public sector assets many years before entering the EU, specialised in crop production, among others due to limited access to labour force. Just after the EU accession, this process continued with even greater intensity. The situation was quite different in the "Małopolska and Pogórze" region, whose agrarian fragmentation and isolation from the market made certain holdings (mainly for economic reasons) unable to develop their production activity.

Taking into account different production types, the value of agricultural production in 2004-2009 increased in dairy holdings and those specialising in herbivore breeding (mainly beef cattle breeding), as opposed to horticultural and orchard holdings (permanent crops) which saw an increase in this regard (Table 5.23). Subsequent years brought no major changes in this situation, but fluctuating prices of agricultural products (starting with higher grain prices) boosted these processes (Table 5.24).

Table 5.23. Changes in the value of agricultural production and selected indicators according to FADN data, by production types (2007-2009 average vs. 2004-2009 average, in %)

Specification	FC	HC	PC	DC	H	G	M
Total output	18.5	-6.7	-7.6	25.5	26.3	11.4	5.0
Crop production	18.3	-7.0	-7.9	35.2	29.6	14.2	9.7
Crop production per 1 ha	35.3	5.7	-24.8	27.3	-0.3	18.0	11.4
Wheat yield	0.9	-4.2	5.1	7.7	8.4	5.5	0.3
Maize (corn) yield	27.1	11.3	31.5	0.5	45.4	19.8	30.6
Livestock production	11.8	46.0	59.1	23.6	25.4	10.9	1.1
Livestock production per LU	21.4	-5.8	11.7	7.7	29.1	41.8	2.7
Milk yield per cow	17.4	11.2	-11.9	4.6	6.8	4.7	5.4

LU – livestock unit

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

As regards production types, there was a clear relationship between an increase in the value of production and the level of direct payments granted to specific groups of entities. Holdings which saw a decline in the value of production and costs received the lowest (several times lower than the average) payments. At the same time, their share in holdings' income was smaller. Thus, the level of support had a significant impact on the intensity and scale of production also in this perspective.

Table 5.24. Changes in the value of agricultural production and selected indicators according to FADN data, by production types (2008-2012 average vs. 2004-2007 average, in %)

Specification	FC	HC	PC	DC	H	G	M
Total output	35.4	-0.6	18.0	47.8	74.1	20.3	59.8
Crop production	38.3	-0.8	18.0	56.9	72.2	43.3	0.0
Crop production per 1 ha	30.3	-4.5	-0.4	34.1	22.5	34.6	24.4
Wheat yield	2.8	-1.3	3.3	15.8	17.9	9.7	2.5
Maize (corn) yield	20.3	8.6	83.9	18.1	38.2	31.9	22.6
Livestock production	-24.2	40.2	3.3	46.0	76.0	14.5	54.7
Livestock production per LU	5.9	29.5	-23.3	20.3	32.6	18.5	31.3
Milk yield per cow	-0.1	1.5	-4.4	9.2	20.7	4.0	29.5

LU – livestock unit

FC – field crops, HC – horticultural crops, PC – permanent crops, DC – dairy cows, H – other grazing livestock, G – granivores, M – mixed

Source: Own calculations based on FADN data.

When comparing these changes with respect to the income-subsidy relationship, a clear pattern could be seen. The lowest productivity growth was characteristic of economic classes with the smallest share of subsidies in income (medium holdings). In contrast, the productivity growth was much larger in classes with a high share of support in income (small and largest holdings). This implies that the level of direct support had an undeniable impact on production, especially in larger holdings. Although the impact in small holdings was lower due to economic conditions (limited financial capacity), it could still be observed.

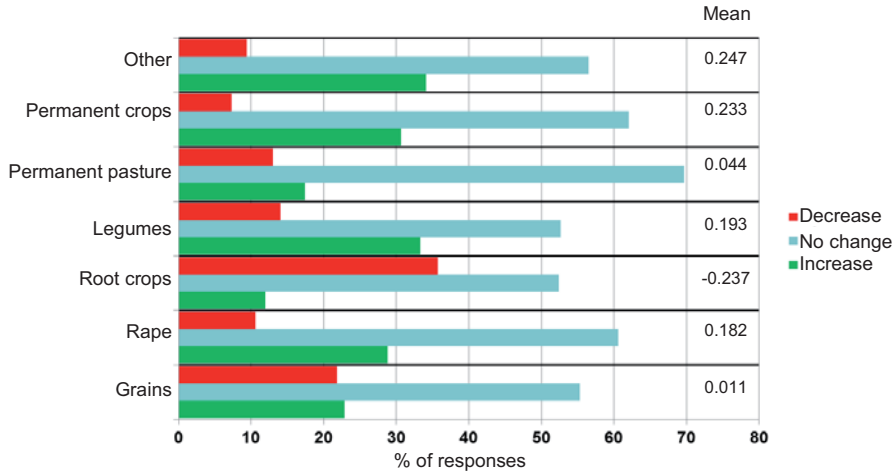
6. Changes in Polish agriculture and the CAP in the opinion of farmers

6.1. Agricultural changes

Changes that have been observed in Polish agriculture after the EU accession based on FADN data analysis are also confirmed, in large part, by the results of IAFE-NRI surveys of 2011 covering nearly 2.5 thousand agricultural holdings. In order to determine changes in the area of arable crops after the EU accession, the farmers surveyed indicated the area of their arable crops in 2011 and its permanent changes in comparison with 2003, i.e. the year preceding the accession. The direction of changes was determined using the arithmetic mean of values from -1 to 1 (-1 – decrease, 0 – no change, 1 – increase).

Among the selected groups of arable crops, only root crops had a negative mean value (-0.237), which suggests that holdings reduced the acreage of these crops, on average, more frequently in the analysed period. However, the situation of other crop groups was the opposite – the crop area was expanded more frequently. The mean values, both negative and positive, were relatively close to zero, thus implying that the incidence of these changes in the study population was small (Figure 6.1).

Figure 6.1. Changes in the acreage of arable crops after the EU accession



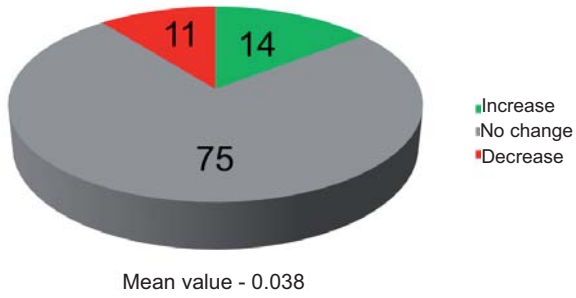
Source: Own calculations based on Appendix 2 to the IAFE-NRI survey, "Family and Its Holding".

Over half of the holdings surveyed reported no permanent changes in the acreage of crops. They were keener on increasing the acreage of most crops rather than

decreasing it, but the difference was small. Root crops were the only exception. Changes in the acreage of grains, permanent pasture and permanent crops were least often reported. About 30% of the holdings surveyed expanded the acreage of other arable crops, legumes, permanent crops and rape. In turn, most of them limited the cultivation of root crops (about 35%) and grains (above 20%). Among reasons for these changes, respondents indicated mostly willingness to change their holding area, including almost 27% of respondents willing to increase its size and 17% – to decrease it. Another group of factors included changes in profitability – its decrease (25%) or increase (12%). Other factors indicated by farmers were far less significant. They include change in business profile and abandonment of agricultural production.

At the same time, just after the EU accession, three-quarters of the studied population did not show significant changes in the use of the means of production. An increase in this regard was reported by almost 15% of the sample, while the remainder (11%) saw a drop in this respect (Figure 6.2).

Figure 6.2. Changes in the use of the means of production after the EU accession (% of responses)



Source: Own calculations based on Appendix 2 to the IAFE-NRI survey, "Family and Its Holding".

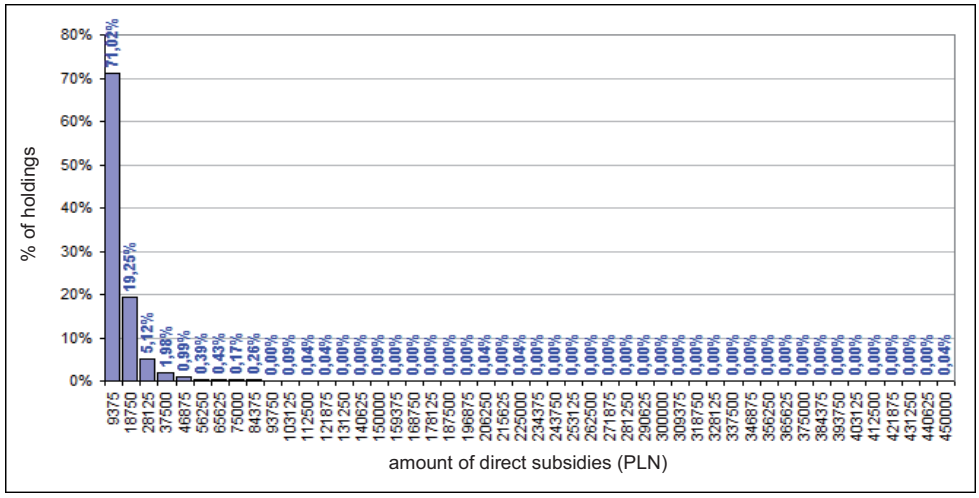
Among reasons for changes in the use of the means of production, the farmers surveyed indicated crop acreage changes (almost 30%), stepping up production (19%), obtaining products of specific quality (18%) and profitability changes (14%). Respondents less frequently (from 1.5 to 9% of responses) reported changing production profile, ceasing production or shifting towards organic farming.

6.2. Direct support

Out of the holdings surveyed, nearly 95% received direct subsidies. The average value of single area payments and complementary area payments in the study population was PLN 8,843 per holding. One-quarter of holdings secured subsidies of

no more than PLN 2.5 thousand (lower quartile) and one-quarter – of over PLN 10.4 thousand (upper quartile), while about half of respondents reported receiving support of less than PLN 5 thousand. The asymmetry coefficient was positive, which points to right-handed distribution, i.e. much more values below the mean, and its value indicated a very large deviation towards this direction. The curtosis indicator signalled a clear sharpness of the distribution. Almost 94% of the holdings surveyed were within the typical area of property variability, i.e. received payments of no more than PLN 24.5 thousand.

Figure 6.3. Amount of single area payments and complementary area payments in 2011 – frequency distribution, histogram*



* The figures on the horizontal axis represent the upper limits of frequency distribution ranges of the value of the property (variable).

Source: Own calculations based on Appendix 2 to the IAFE-NRI survey, "Family and Its Holding".

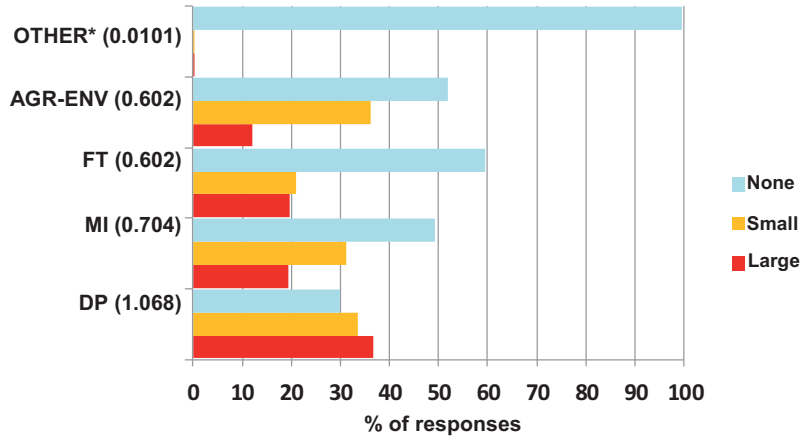
The average area covered by single area payments and complementary area payments was 11.5 ha, which accounted for PLN 714 per 1 ha on average. Similarly to the amount of these benefits, the distribution of this variable was strongly right-handed and peaked. Three-quarters of holdings received subsidies to areas not exceeding 13.5 ha and half of them – to 7.0 ha. The typical area of variability (up to 29.4 ha) covered over 91% of the holdings surveyed.

6.3. CAP impact on agricultural changes

The farmers surveyed identified the impact of various CAP regulation groups as follows: 0 – none, 1 – small, 2 – large. Therefore, the impact was determined using the arithmetic mean between 1 and 2.

Having analysed the arithmetic means obtained, it can be concluded that the CAP impact on agriculture was rather small. Answers indicating large impact were the largest group with regard to direct payments. Over one-third of respondents indicated large impact, one-third – small impact, and only one-quarter – none. Values similar to or equal one, reflecting small CAP impact, occurred with regard to market intervention and the foreign trade regulation system. Thus, the meaning of the first one was almost on a par with trade regulations. However, there are large differences in assessment of these regulation groups. As regards market intervention, more respondents indicated small impact, significantly less – none or large impact, as opposed to trade regulations. Mean values for agri-environmental programmes and other regulation groups differed largely from the abovementioned regulation groups.

Figure 6.4. CAP impact on changes in Polish agriculture



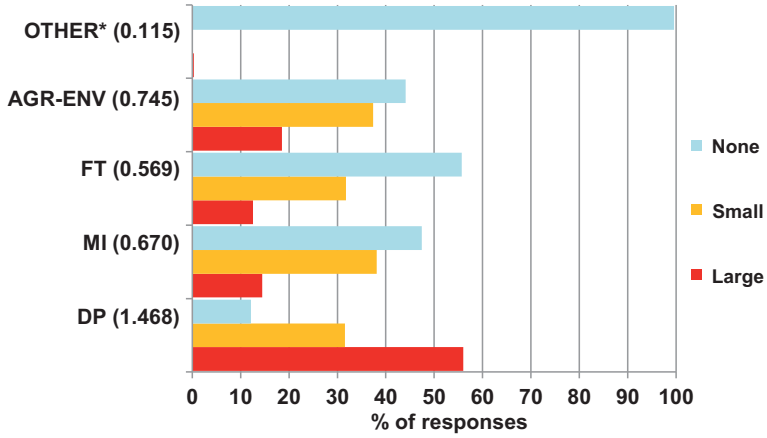
* mean value of responses in parentheses

DP – direct payments, MI – market intervention, FT – foreign trade regulations, AGR-ENV – agri-environmental payments, OTHER – other regulations

Source: Own calculations based on Appendix 2 to the IAFE-NRI survey, "Family and Its Holding".

The analysis of mean results concerning the CAP impact on farmers' income (which were interpreted just like in the case of assessing the regulation impact on agricultural changes) clearly indicates a dominant impact of direct payments in this respect. Almost 65% of the farmers surveyed pointed to a large impact of direct support on holdings' income and only 13% indicated no impact. In accordance with the farmers surveyed, the impact of other regulations was small or none (Figure 6.5).

Figure 6.5. CAP impact on agricultural holdings' income

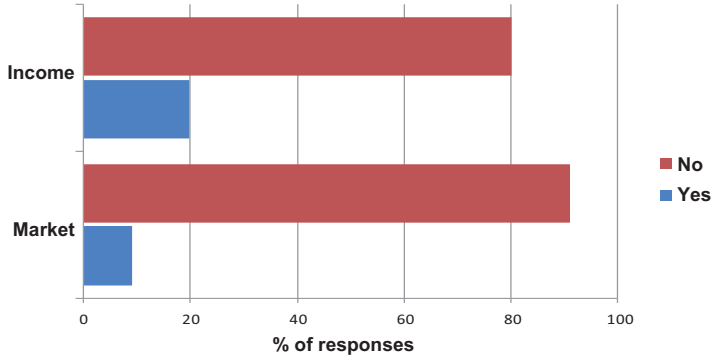


* mean value of responses in parentheses

DP – direct payments, MI – market intervention, FT – foreign trade regulations, AGR-ENV – agri-environmental payments, OTHER – other regulations.

Source: Own calculations based on Appendix 2 to the IAFE-NRI survey, "Family and Its Holding".

Figure 6.6. CAP impact on the stabilisation of agricultural markets and farmers' income



Source: Own calculations based on Appendix 2 to the IAFE-NRI survey, "Family and Its Holding".

Great majority of the farmers surveyed took a negative view on the role of CAP regulations as a factor to stabilise both agricultural markets and agricultural income. However, the share of positive assessments regarding income stabilisation was almost twice higher than that of assessments concerning market stabilisation (Figure 6.6).

7. Effectiveness and efficiency of EU financial support in regional development

7.1. Convergence problems at the local level

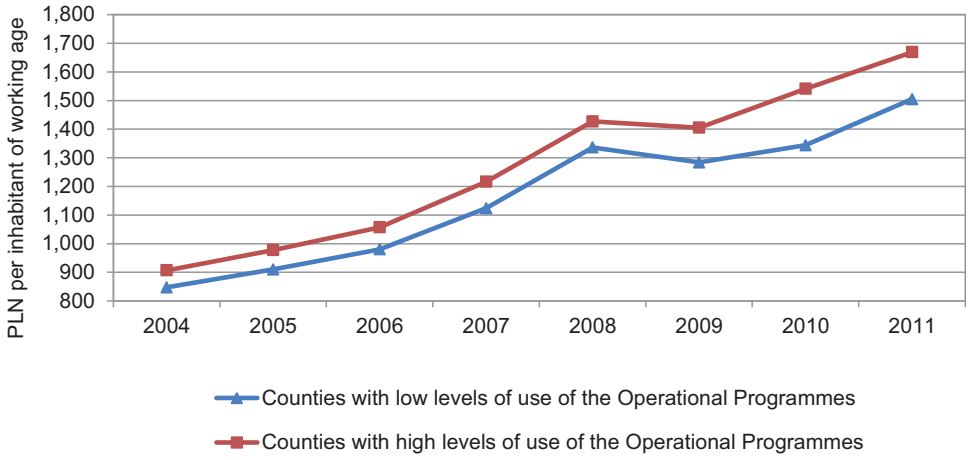
In the study period, i.e. in 2004-2011, the nominal own incomes per 1 inhabitant showed an upward trend. The break in the trend occurred in 2009, which was associated with the financial crisis in Europe. However, in the next two years after the collapse there was again an increase in income. In this context, it can be concluded that both the market conditions, as well as state-led policies were conducive to the development of rural areas and contributed to the relatively rapid overcoming of the negative effects of the financial crisis. The observed trends and the course of changes in the level of own income are therefore prerequisite to finding that the policy pursued to support the development of entrepreneurship, including based on various instruments financed by the European Union, does not contribute to equalising the level and pace of development at the local level. However, one should note that this process of equalising the development in the local system does not have to be the goal of this policy. In addition, slower income growth for low-income counties can be explained in the context of the Williamson's hypothesis. According to it, they still have not reached a certain level of economic development to significantly accelerate the rate of development.

Considering the impact of the measures from the budget of the European Union on local economic development, one should pay attention to changes in own income of counties in groups differing in terms of the level of absorption of these measures by the local community[14] (Figure 7.1). Launching in 2007 of new programmes created quite wide possibilities for people and businesses to establish new businesses and extend existing businesses. However, the European Commission introduced the obligation to engage own capital as a condition of assistance. As a result, larger scale of the use of funds was in counties receiving higher own income in the period 2004-2011 (Figure 7.1), i.e. in units where people and businesses obtained higher incomes. In other words, entities had greater opportunities to engage own funds in establishing or developing business ventures. However, by 2007, own income of both groups of counties steadily increased, and the difference in nominal terms remained at a constant level. Since 2008, i.e. almost from the start of the programmes, counties with greater use of EU aid began to obtain more and more advantage in terms of their incomes. At the same time there was a smaller decrease in their income as a result of the financial crisis. It can therefore be assumed that the scale of EU support had a significant positive impact on own income of rural counties. However, the use of various support pro-

[14] The criterion was the median of income obtained in individual counties from operational programmes referred to in the methodical chapter, calculated per 1 inhabitant of working age.

grammes did not initiate the process of equalising income of counties and even led to increase in differences at the local level. Changing the criteria for the distribution of the support measures could counteract the increasing differences in the pace of economic development of counties. However, one must bear in mind other barriers to economic development when taking this type of action. Administrative increase in allocation of funds to units with lower incomes may lead to a significant reduction in the efficiency of support due to the presence of these barriers. On the basis of changes in own income, one can also draw a preliminary conclusion that the possibility of closing the gap in local development in rural areas with the help of existing policy instruments to promote entrepreneurship is generally very limited, or even non-existing. This does not undermine earlier claims regarding the positive impact of these instruments on the income received regardless of its initial level.

Figure 7.1. Own income of rural counties in 2004-2011, by groups differed in terms of the use of EU funds under operational programmes involving support for the development of entrepreneurship

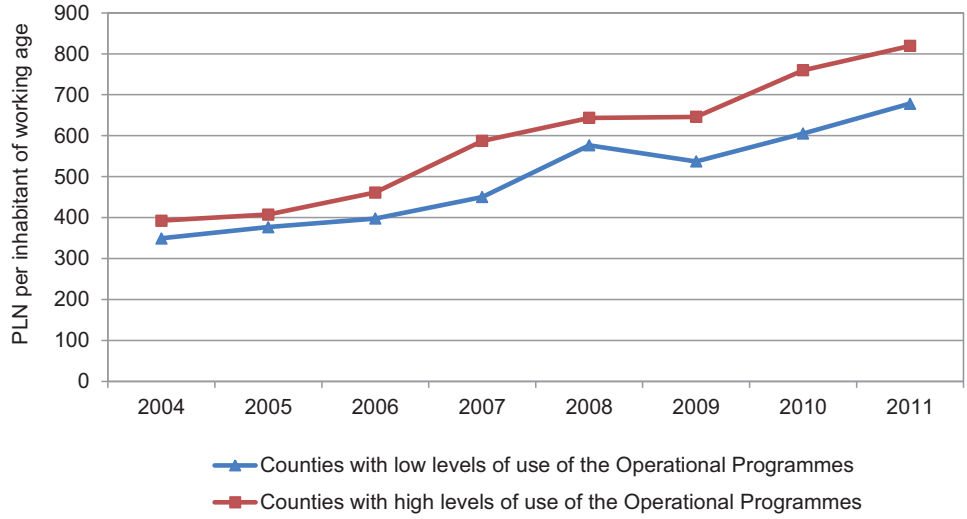


Source: Own calculation based on CSO Local Data Bank.

The growth rate of own income, however, was quite different both in counties with high and low absorption of EU funds. This is evidenced by changes in quartile range of own income per inhabitant of working age (Figure 7.2). The upward trend of these statistics in the two groups of counties indicates the isolation of a subgroup with high incomes, and at the same time a higher rate of growth. The advantage of high-income communities in terms of economic development, however, is larger and increases faster in the group with higher levels of use of EU assistance provided under the various operational programmes. This confirms the close relationship between the level of local economic development and utilization of EU funds. It seems, however, that public support, despite the acceleration of local development, leads to divergence

rather than convergence in rural areas. One can even expect the emergence of local core centres in rural areas, which will be sort of leaders in terms of rural development. This phenomenon should not be assessed negatively because it can be one of the paths to achieve regional convergence. The effectiveness of support for this model of development may in fact be higher than in the model to equal the rate of development.

Figure 7.2. Quartile range of own income in rural counties in 2004-2011, by groups differed in terms of the use of EU funds under operational programmes involving support for the development of entrepreneurship



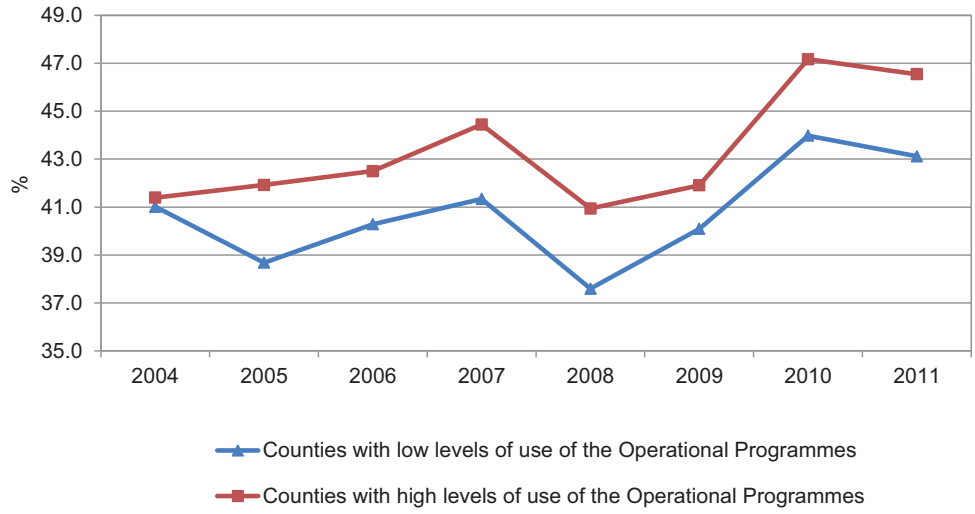
Source: Own calculation based on CSO Local Data Bank.

Coefficients of variation of own income of counties take large values in both the group with low and a relatively high use of EU funds (Figure 7.3). Higher levels of internal diversity, however, are characteristic of the group with a high level of use of these resources. Since 2005, changes in diversification of counties have been similar in both groups. However, in recent years there has been a much greater increase in income volatility in the group of counties with high levels of use of EU funds. One can state with high probability that this is the effect of isolating the group of counties with high incomes as a result of, inter alia, the impact of EU support. However, the analysis of counties diversification depending on the level of this support does not confirm the process of equalization the pace of local development.

The analyses of diversification of own income of counties do not give a complete picture of occurring changes. The results in many cases lead to conclusions of a fairly large or fairly high diversity of own income of counties per 1 inhabitant. These concepts in case of analysis of basic statistics are, however, relative and subjective in

nature. In order to objectify the results the Gini coefficients were used to assess income diversification of counties per 1 inhabitant of working age, as a measure of local economic development, and changes of this diversification. This will also allow verification of the previously obtained results.

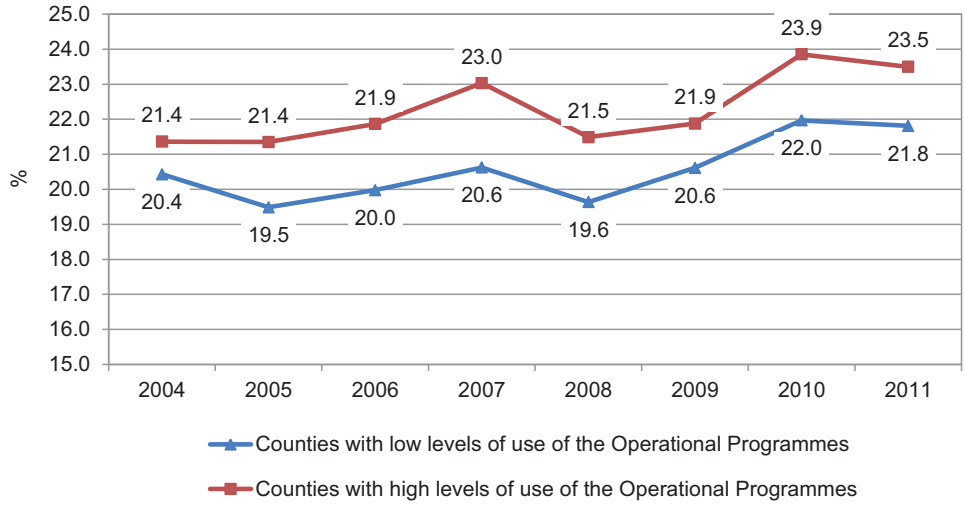
Figure 7.3. Coefficients of own income diversification in rural counties in 2004-2011, by groups differed in terms of the use of EU funds under operational programmes involving support for the development of entrepreneurship



Source: Own calculation based on CSO Local Data Bank.

Changes and relationships of the Gini indices in groups of counties diversified in terms of the level of use of EU funds by the local community (Figure 7.4) were similar to the case of coefficients of variation for the income of these groups. Both groups showed a slight upward trend of the coefficient, which means widening the gap of income regardless of the level of support used. However, counties with higher use of those funds were also characterized by higher level of the Gini coefficient in the corresponding period, i.e. they were more diverse in terms of their income. Analysis of changes in the Gini coefficient confirms the lack of impact of the EU funds absorbed by the local community on bridging the differences in the level and pace of local development. These measures affect rather the widening of the gap. One can also state that they favour particularly the development of the most developed counties. However, taking into account the relatively low level of the Gini coefficients and widening of the gap, one should confirm the thesis formulated earlier that a significant portion of the underdeveloped rural counties have not yet reached an adequate level of development in order to effectively use public support to significantly accelerate the rate of growth.

Figure 7.4. Gini indices for own income per inhabitant of working age in rural counties in 2004-2011, by groups differing in terms of the use of EU funds under operational programmes involving support for the development of entrepreneurship



Source: Own calculation based on CSO Local Data Bank.

Analysis of the basic statistics and the Gini indices for own income confirms the diversification of rural counties and the deepening of existing differences associated with the isolation of a group of counties with high incomes and a higher rate of growth. The relatively low values of the Gini coefficient show, however, that the variation is not too large. If one also takes into account the lack of a clear acceleration of the rate of development in the least developed counties, it can be concluded that a significant proportion of counties has not yet reached the critical level of development, beyond which the rate will significantly increase. The structural and regional policy, focused on the use of financial instruments, has no positive impact on reducing inequalities in local development. However, this does not mean the absence of a positive effect on income growth and slowing down the rise of differences.

The analysis of basic statistics and the Gini indices does not give a complete picture of the process of equalising the level and pace of development of counties. It is rather an analysis of differentiation, based on which one can define some rationale of this process. In order to verify or rather extend the results obtained, a method of absolute beta convergence has been used. This method allows determining whether the counties with low levels of income are catching up in terms of their growth with counties with higher income and determining the time in which the existing differences will be reduced by half. Analysis of changes in own income, carried out by the absolute beta convergence shows that the phenomenon occurs of local convergence among counties – determined based on changes in own income.

The impact of regional and structural policy on processes of aligning counties in terms of economic development is highlighted by the results obtained from the model of absolute beta convergence for groups of counties differing in terms of the level of absorption of the different EU funds aimed at the development of entrepreneurship (Table 7.1 and 7.2). The analysis shows that convergence process occurred regardless of the level of funds obtained from the European Union. The group of counties with high absorption rate achieved the rate of convergence at nearly 5% per year, which was 1 percentage point higher than in counties with small-scale use of these funds. Moreover, in this group, the period of halving the distance to the long-term equilibrium state was less than 14 years and was shorter by more than 3.5 years than in counties with low levels of absorption. This means that the higher level of financial support in the framework of the policies has a significant impact on the rate of convergence, in conditions of increasing diversity.

Table 7.1. The results of the regression analysis for the absolute beta convergence for own income per inhabitant of working age (2004-2011) by groups differing in terms of the use of EU funds under operational programmes involving support the development of entrepreneurship

Specification	Value of regression coefficient	Standard error	P-value	Level of significance
Counties with low levels of use of Operational Programmes				
ln (DW)it-1	0.31782	0.070902	7.38E-06	0.01
# observation	3,825			
AR(2)	-0.6956774		0.24332	
Sargan test	50.51734		5.00E-06	
Counties with high levels of use of Operational Programmes				
ln (DW)it-1	0.416062	0.081761	3.61E-07	0.01
# observation	3,820			
AR(2)	0.5279689		0.29876	
Sargan test	56.5419		4.70E-07	

Source: Calculation by Marcin Gospodarowicz based on CSO Local Data Bank.

Table 7.2. Rate the absolute convergence of type β and the period of halving the difference in own income in 2004-2011, by groups differing in terms of the use of EU funds under operational programmes involving support the development of entrepreneurship

Specification	Beta-convergence coefficient	Half-life
Counties with low levels of use of Operational Programmes	0.0394	17.6
Counties with high levels of use of Operational Programmes	0.0497	13.9

Source: Calculation by Marcin Gospodarowicz based on CSO Local Data Bank.

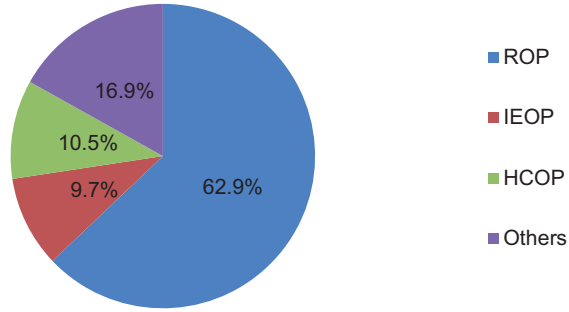
7.2. Efficiency of financial support at the local level

In 2007-2013, support for the development of economic activity, especially the SME sector, was one of the objectives of EU policy. Non-refundable financial assistance, which was supposed to boost the development of the sector, was the main instrument to implement this policy. In other words, the support of the European Union came down to the transfers of funds distributed at the national level under various operational programmes, such as Human Capital (HCOP), Innovative Economy (IEOP) or Regional Operational Programmes (ROP). However, not all measures under these programmes, covered direct financial support to enterprises in the form of subsidies on their day-to-day operations and investment activities. Nonetheless, even those oriented to the development of technical and social infrastructure, the development of a system for the transfer of knowledge and consultancy services or support public administration, affected decisions both on launching and running economic activity, as well as its certain economic effects. However, financial transfers from the EU budget under operational programmes may cause certain changes at the level of both economic entities, as well as on a wider scale, i.e. in the local, regional or national economy. Their impact on the local economy seems to be especially important, as this is the administrative level at which new economic entities are registered or jobs for the local community are created. This chapter presents the results of research on the relations between the support and local economy changes. These relations are defined as the local efficiency of support.

As it has been mentioned in Chapter 2, the research covered 1,529 rural counties. In 2007-2013, these counties received about PLN 13.1 billion within the framework of different projects under, among others, the Regional Operational Programmes, the Human Capital Operational Programme, the Innovative Economy Operational Programme. Most of the funds, were transferred under the Regional Operational Programmes. Nearly 63% of the total EU budget (Figure 7.5) designated for the analysed rural areas was spent on measures under these programmes, which included both direct and indirect support for the development of economic activities within the framework of infrastructure projects.

Research shows that each county received nearly PLN 1.9 thousand per capita of working-age population on average. However, the median value was below PLN 1.1 thousand, meaning that the vast majority of counties received support below the average for these areas. 25% of the examined counties obtained less than PLN 492 per capita of working-age population, and further 25% of counties – above PLN 2.2 thousand, i.e. slightly more than the average. Undoubtedly, the received financial assistance varied significantly, which is proved by the coefficient of variation that reached 251%.

Figure 7.5. Structure of financial transfers from the EU budget to the examined group of rural counties in connection with completed projects (as of 31 December 2013)



Source: Own calculations based on CSO data.

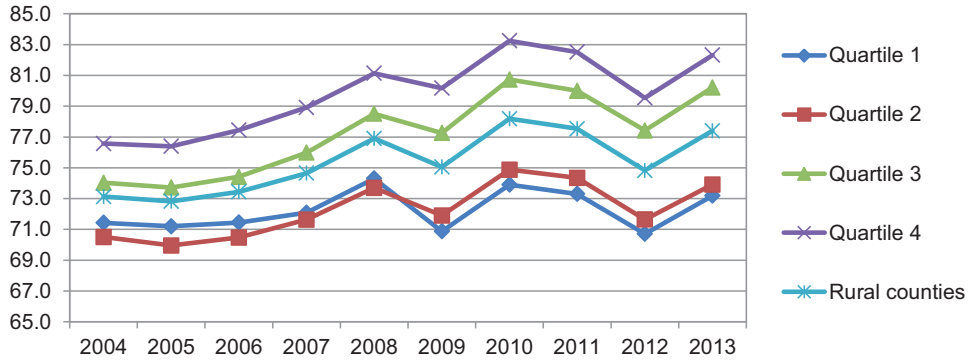
In 2004, i.e. at the time of Poland's accession to the European Union, over 545 thousand private sector economic entities (employing at least 10 workers) operated in the examined area. Their number increased steadily until 2013, in which it reached nearly 712 thousand (Figure 7.6). In 2013, there were also nearly 706 thousand micro-enterprises in the rural areas concerned. A certain slowdown in this upward trend was observed only in 2009, which was largely due to the financial crisis in Europe. Nonetheless, enterprise growth rates in rural areas in 2007-2013 and 2004-2006 were similar. It should be noted, however, that different instruments to support the development of economic activities in rural areas were also used in 2004-2006. Therefore, comparing certain economic changes during these two periods would, in principle, bring little to the analysis of the local efficiency of EU policy instruments. For this reason, the economic changes observed were analysed depending on the level of the support received. For this purpose, the counties were divided into quartiles, the boundaries of which are shown in the previous paragraph.

Figure 7.6. Number of private sector entities in the examined group of rural counties

Source: Own calculations based on CSO data.

Changes in an indicator of a sort of saturation of the areas concerned with economic activity were slightly different. When analysing the number of private economic entities per 1 thousand working-age residents (Figure 7.7), it should be noted that a slowdown in the upward trend was observed not only in 2009, but also in 2011 and 2012. However, its causes were different. In 2009, the slowdown resulted from the financial crisis, while in 2011 and 2012 – from a relatively greater increase in the number of working-age population. In other words, the increase in the number of entities lagged behind the growth in the labour force. Such a situation was observed regardless of the level of support (Figure 7.7). In fact, a similar break in the trend was observed in county groups with a low relative level of support (quartiles 1 and 2) and in county groups which received a high level of support (quartiles 3 and 4). However, the relative number of enterprises in 2007-2013 grew, regardless of the level of support.

Figure 7.7. Number of private economic entities per 1 thousand working-age individuals, in county groups with different levels of EU support per capita of working-age population

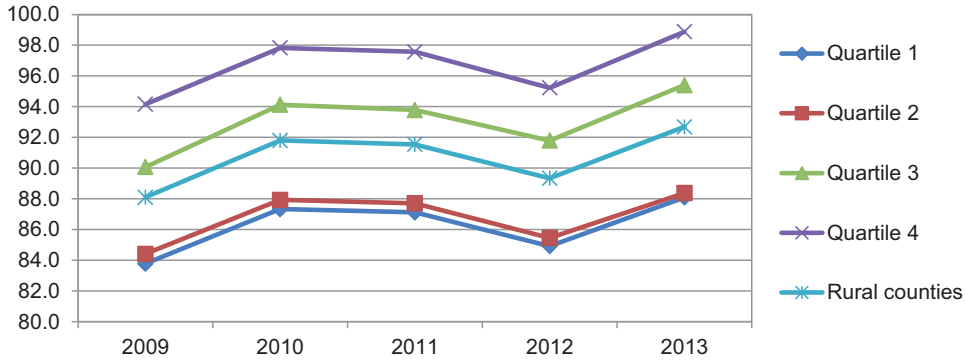


Source: Own calculations based on CSO data.

Research also shows that rural counties with more developed economic activities received relatively more funds from the EU budget. In 2007, the number of enterprises per 1 thousand working-age individuals was in fact much higher in third- and fourth-quartile counties, i.e. those with a higher level of EU support per capita of working-age population, than in first- and second-quartile counties (Figure 7.7). Similar trends were also observed as regards an indicator of the number of micro-enterprises per 1 thousand working-age inhabitants. Although there are no adequate data to analyse changes since 2004, the trend was similar as proved by a decline in the number of enterprises in 2011 and 2012, regardless of the level of support (Figure 7.8). What is more, there is a quite interesting phenomenon to note in the case of first- and second-quartile counties. Following the launch of various financial support instruments, non-agricultural economic activities of physical persons (Figure 7.7) developed

the least in counties, in which potential beneficiaries least benefited from them. On this basis, one could even hypothesise that if the development of entrepreneurship in rural areas is poor, a significant increase in the level of public support will considerably accelerate its development. However, more in-depth research is needed to verify this hypothesis.

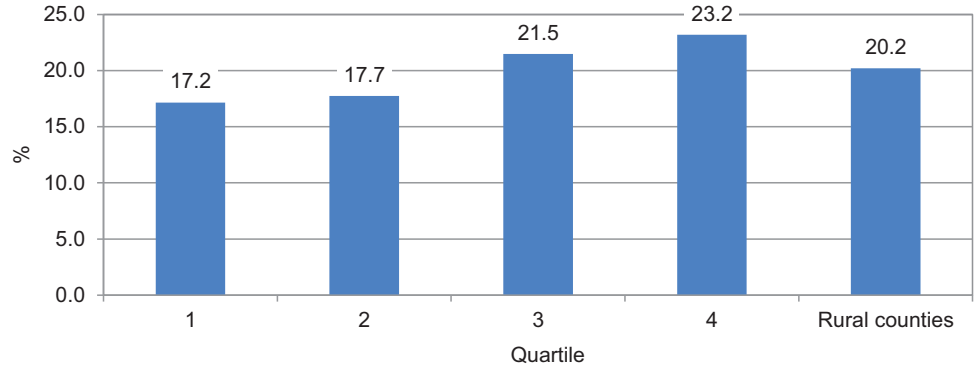
Figure 7.8. Number of micro-enterprises per 1 thousand working-age inhabitants, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

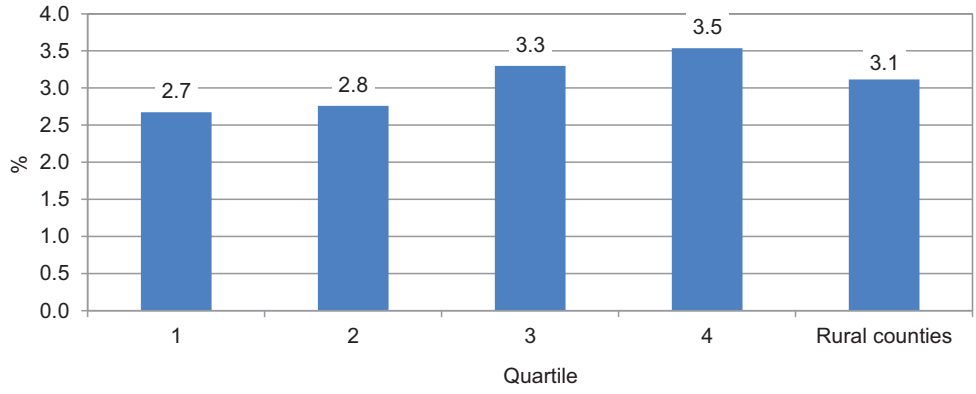
While analysing an increase in the absolute number of economic entities in county groups with different levels of financial support (Figure 7.9), thus excluding the negative impact of the increased number of working-age population, it can be concluded that the relative level of financial transfers from the EU budget played an important role in launching economic activities by physical persons. In 2007-2013, i.e. the effective period of the financial instruments concerned, a larger increase in the number of economic entities was observed in county groups with a greater level of support. Quartiles 1 and 4 are significantly different. Throughout the effective period of support, the number of these entities in the latter increased by as much as 6 percentage points. At the same time, it should be noted that the number of economic entities grew more in county groups, in which the initial number of the entities was higher. Having regard to the increase in the number of private economic entities, EU financial support can be considered as a quite efficient instrument. It is further confirmed when analysing the average annual growth rate of the number of entities for this category (Figure 7.10). As a point of fact, the rate was 0.7 percentage points higher in counties with the highest level of support than in counties in which this support reached the lowest level. Nevertheless, despite the positive impact on the development of economic activities, further financial support under the same conditions can lead to excessive diversity in the development of economic activities between rural areas.

Figure 7.9. Increase in the absolute number of private economic entities in 2007-2013, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

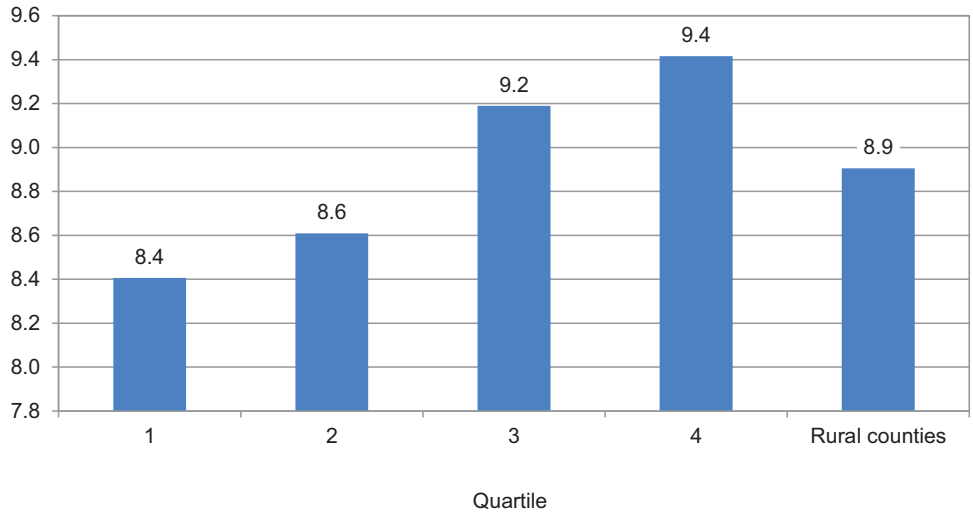
Figure 7.10. Average annual growth rate of the number of economic entities in 2007-2013, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

Not only the changes in the number of enterprises but also the process of setting up new entities confirm an important role of direct and indirect financial support in the development of non-agricultural activities (Figure 7.11). In fact, the number of private enterprises rose each year by one more per 1 thousand working-age residents in counties with the highest level of support than in counties in which this support reached the lowest level. Therefore, funds raised under operational programmes applicable throughout this period were a strong driving force for establishing new economic entities. The higher the level of support, however, the greater was their number.

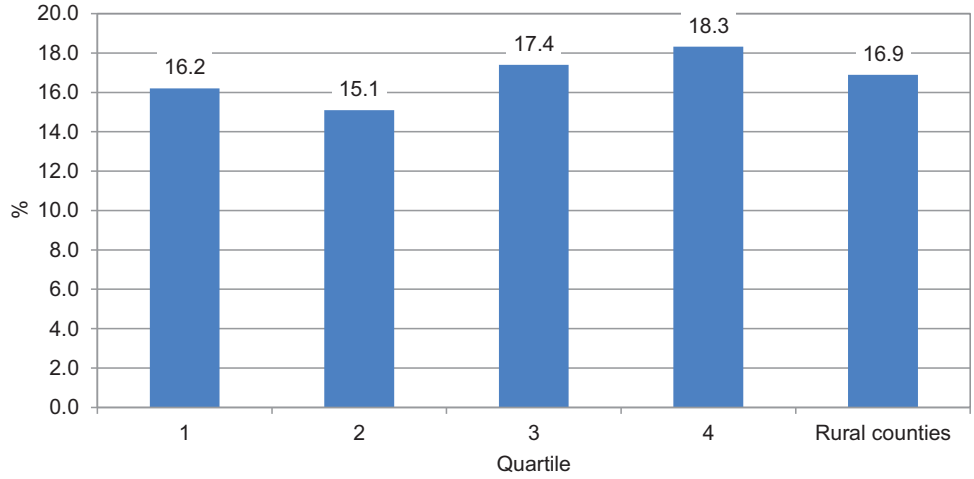
Figure 7.11. Number of new private economic entities per 1 thousand working-age residents, established on average every year in 2009-2013, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

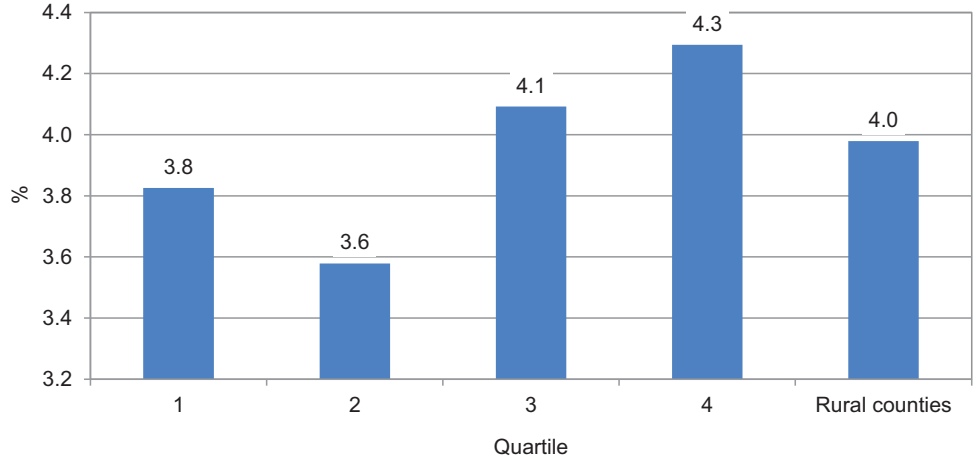
Similar relations, as in the case of private economic entities, were observed between an increase in the number of micro-enterprises and the level of EU financial support. However, due to data availability, the analysis covered the years 2009-2013 in this case. Thus, the period began with the year which brought the break in the upward trend in the number of entities due to the financial crisis. However, the number of entities grew much more in county groups with medium-high and high levels of support (Figure 7.12). Nonetheless, the difference in the growth between extreme, in terms of the level of support, county groups was only 2.1 percentage points. At the same time, it should be noted that the smallest growth in the number of micro-enterprises was not observed in county groups with the lowest level of support, but rather in those with medium-low support (quartile 2). The growth in the number of micro-enterprises in 2009-2013 slightly accelerated their average annual growth rate (Figure 7.13), as opposed to private enterprises. This difference may, however, result from using the baseline situation of the year 2009, in which the financial crisis particularly severely affected economic activities. Nevertheless, having analysed this indicator, it can be stated that it is a rapidly developing sector, especially with financial support from the EU budget.

Figure 7.12. Increase in the absolute number of micro-enterprises in 2009-2013, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

Figure 7.13. Average annual growth rate of the number of micro-enterprises in 2009-2013, in county groups with different levels of EU support per capita of working-age population

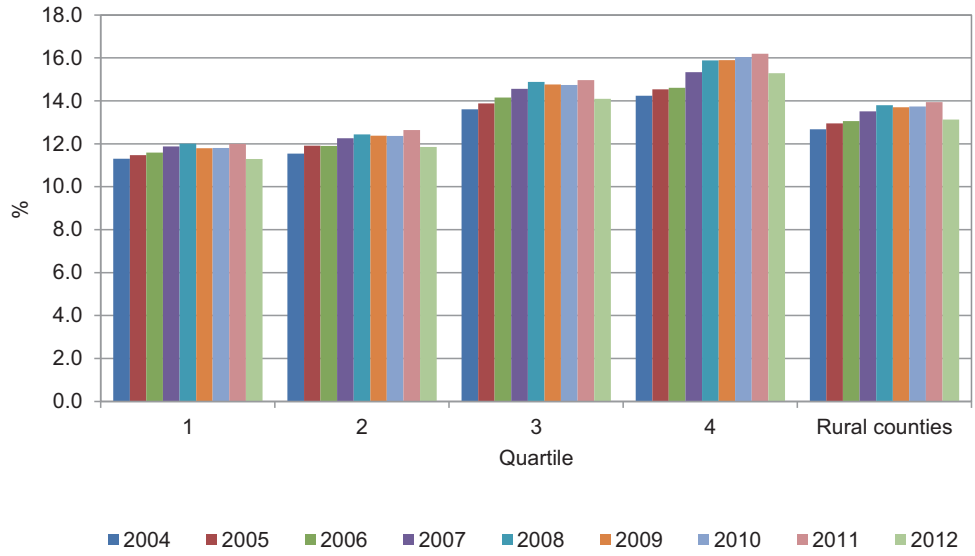


Source: Own calculations based on CSO data.

Among others, EU policy aimed at increasing employment and reducing unemployment. When assessing the efficiency of financial support, changes caused in rural areas in these fields must therefore be taken into account. Trends in employment

changes were quite similar in nature to changes in the development of economic activities in the areas concerned. In 2004-2012[15], two periods can be distinguished. In 2004-2008, there was a systematic increase in the share of the employed[16] in the total number of working-age population (Figure 7.14). The next period brings a break in this trend due to the financial crisis and the increasing number of working-age population. Therefore, a decline in the share of the employed was observed throughout the effective period of EU support, i.e. 2007-2012 (Figure 7.15). The smallest decline in this value was recorded in counties with the highest level of support, while the largest drop was observed in those in which this support reached the lowest level. Therefore, public support from the EU budget mitigated the effects of economic and social phenomena, causing the break in the upward trend. It should be emphasised that the initial relative level of employment was the highest in the group at issue. This means that public funds contributed most to the maintenance of employment in rural counties in which its level was the highest. However, this was possible only with the relatively high level of support.

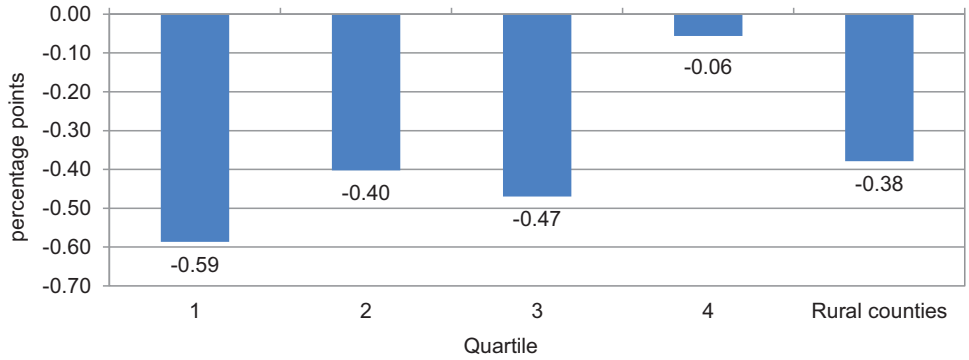
Figure 7.14. Share of the employed in the total number of working-age population in 2004-2012, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

[15] Due to data availability at the time of analysis, 2012 was taken as the final year.
[16] This applies to those working in companies employing at least 10 persons.

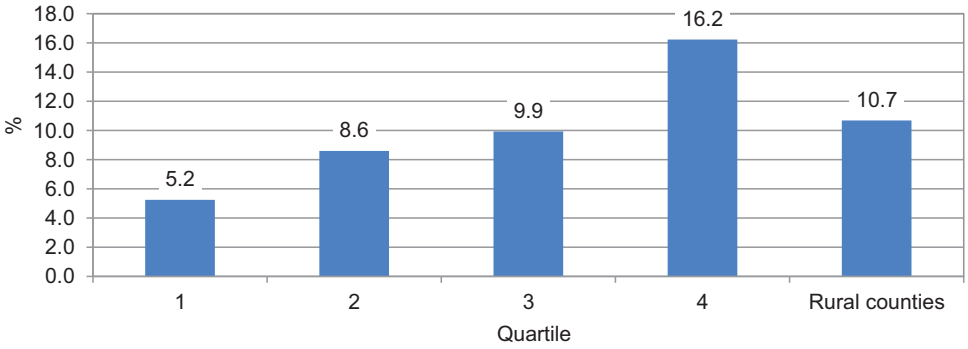
Figure 7.15. Changes in the share of the employed in the total number of working-age population in 2007-2012, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

In 2007-2012, the share of the employed in the total number of working-age population decreased. However, in absolute terms, employment in rural areas increased by 10.7% (Figure 7.16). This employment growth was observed in all county groups, regardless of the level of support. Nevertheless, it was greater in counties with a higher level of EU support. Research shows that the difference between extreme, in terms of the relative level of support, county groups was as much as 11 percentage points, meaning that public funds were a relatively strong driving force for the recruitment of new staff, although they were insufficient to create conditions, in which these growing labour resources would be fully utilised. It should also be emphasised that the fastest growth in employment was observed in counties, in which its level was higher. In view of the above, it can be concluded that the diversity of rural areas in terms of the utilisation of labour resources increases. Nonetheless, the criteria used to distribute public financial support foster a kind of rural economic polarisation.

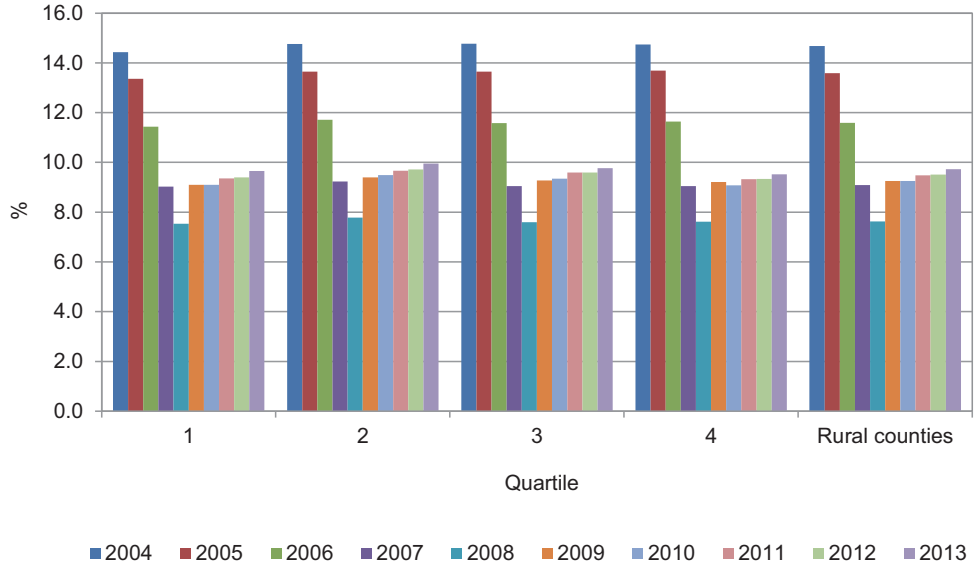
Figure 7.16. Changes in the number of the employed in 2007-2012, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

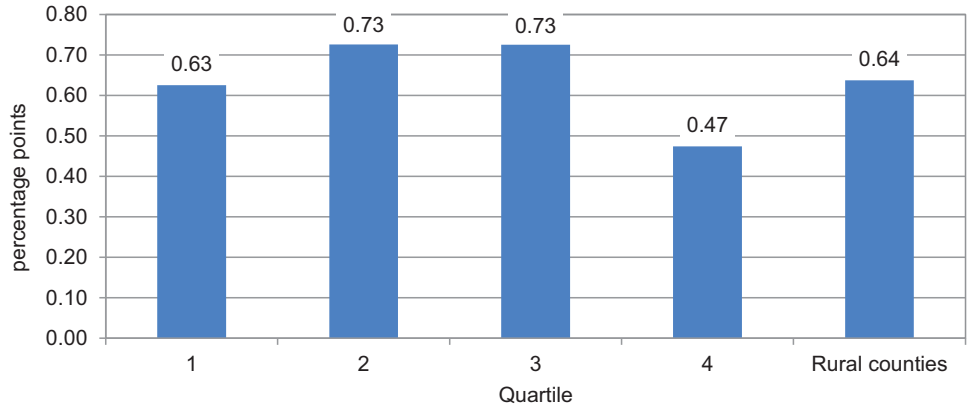
During Poland's membership in the European Union, two characteristic periods in unemployment changes can also be distinguished. In 2004-2008, there was a systematic and quite dynamic drop in the share of the unemployed in the total number of working-age rural population. In 2009, the financial crisis brought the upward trend that lasted until 2013. The unemployment rate increased relatively in all counties, regardless of the level of the support obtained from the EU budget (Figure 7.17). Furthermore, there were no significant differences in the level of unemployment among county groups with different levels of EU assistance. The smallest increase in the share of the unemployed in 2007-2013 (Figure 7.18), i.e. 0.47 percentage points, was observed in counties with the highest level of financial support. This would suggest that only a high level of EU funds slowed down unemployment growth. Therefore, the use of direct and indirect financial support as an instrument to reduce unemployment can be efficient, but it cannot be applied on a wider scale at both EU and national levels due to budgetary constraints. However, it can be a spot-intervention instrument.

Figure 7.17. Share of the unemployed in the total number of working-age population in 2004-2013, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

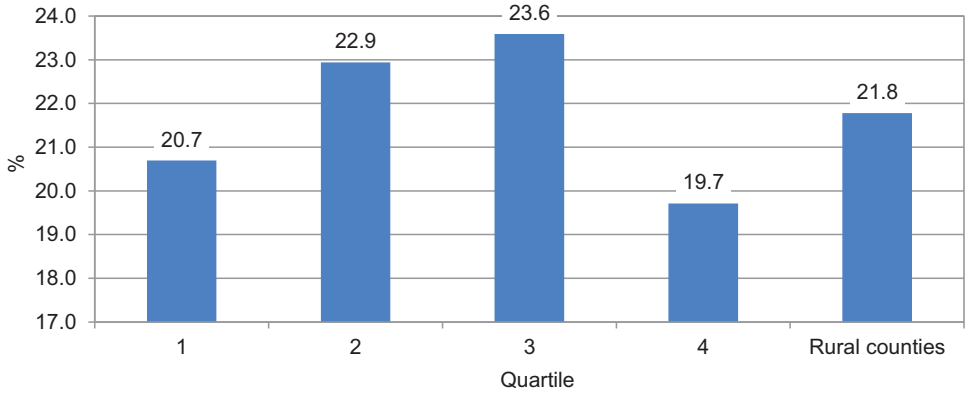
Figure 7.18. Changes in the share of the unemployed in the total number of working-age population in 2007-2013, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

Unemployment growth in the effective period of the said policy instruments was observed not only in relative, but also in absolute terms (Figure 7.19). Nevertheless, changes in the number of the unemployed were in line with the share of the unemployed in the total number of working-age population, since a high level of support slowed down unemployment growth. In the period concerned, the number of the unemployed increased by 1 percentage point less in counties with the highest level of support than in counties in which this support reached the lowest level and by nearly 4 percentage points less than in counties with medium-high support. Unfortunately, a significant slowdown in unemployment growth is not observed in the case of the lower level of financial transfers from the EU budget.

Figure 7.19. Changes in the number of the unemployed in 2007-2013, in county groups with different levels of EU support per capita of working-age population

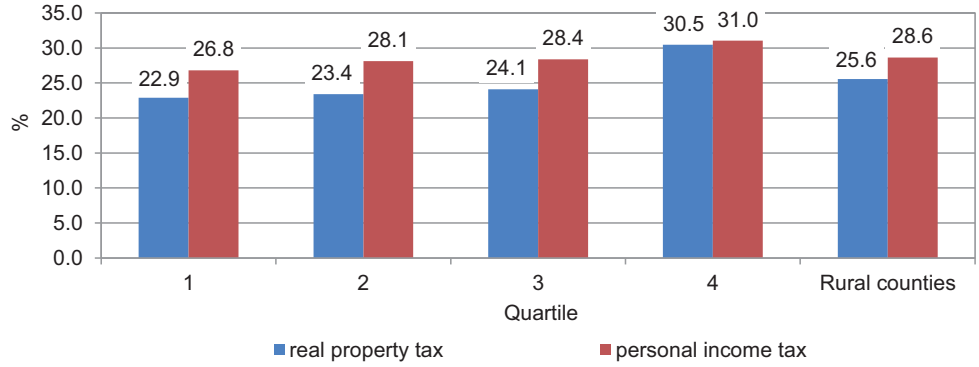


Source: Own calculations based on CSO data.

The impact of financial support from the EU budget on local economies is reflected not only in the development of non-agricultural economic activities or labour market changes. The effects of financial transfers are also noticeable in the trends of changes in the different categories of municipal revenues. The impact of the level of support on the economic situation can be particularly well illustrated by reference to own municipal real property tax revenues and a share in personal income taxes. As a point of fact, these revenue categories are a function of local community assets and earned labour revenues.

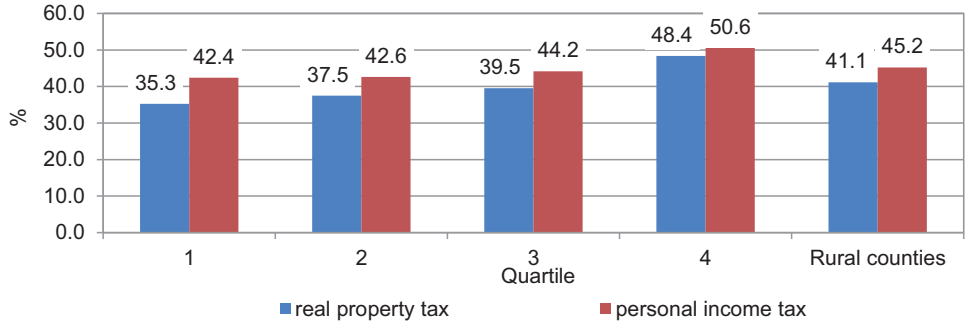
Analyses show that the relative level of the support obtained significantly contributed to increasing municipal budget revenues from both real property and income taxes in relative and absolute terms (Figure 7.20 and 7.21). Own real property tax revenues per capita in county groups with the highest level of support increased by as much as 7.6 percentage points more than in counties in which this support reached the lowest level. As regards personal income taxes, these relations were also observed, but the difference was only 4.2 percentage points. Even greater differences between extreme county groups were reported in terms of revenue growth in absolute terms (Figure 7.21). In fact, real property tax revenues in county groups with the highest level of support increased by as much as 13.1 percentage points more than in the group with the least resources secured. As regards an increase in personal income tax revenues, this difference was slightly smaller, but still reached as much as 8.2 percentage points. On these grounds, it can be concluded that the larger level of EU funding accelerates the growth rate of own municipal real property tax and personal income tax revenues. Thus, an increase in financial transfers of public funds leads to an increase in local community assets and community incomes. However, the rules of distribution of these funds applicable in the period concerned may lead to an increase in economic diversification of rural counties, unless other conditions counteract it.

Figure 7.20. Increase in the average level of own municipal real property tax and personal income tax revenues per capita of working-age population in 2007-2012, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

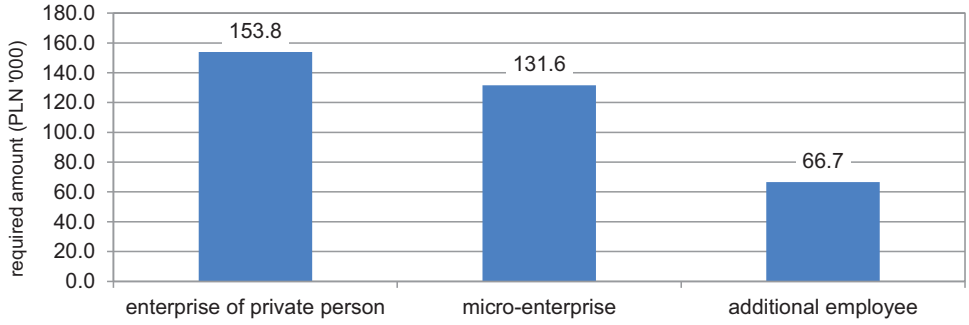
Figure 7.21. Increase in own municipal real property tax and personal income tax revenues in 2007-2012, in county groups with different levels of EU support per capita of working-age population



Source: Own calculations based on CSO data.

The impact of the level of support on the level of own revenues is also confirmed by research carried out using specific methods, such as correlation and regression analyses. The correlation coefficient between the level of funds transferred to counties in 2007-2013 and municipal real property tax revenues obtained in 2013 was 0.35. As for municipal personal income tax, it was 0.32. Indeed, both correlation coefficients are not too high, but the tests carried out confirmed their significance at 0.05. In turn, simple regression models, developed in both cases, revealed that the support used resulted in a measurable increase in income tax revenues. The models show that every PLN 1 of gained support led in 2013 to an increase in real property taxes by PLN 0.04, while in personal income tax revenues – by PLN 0.05. Both determination coefficients reached just 0.1, but were statistically significant. Thus, the models developed explain this increase in revenues thanks to EU support only in 10%. Nevertheless, they confirm the important role of this support in improving the economic situation.

Figure 7.22. Amounts of support from the EU budget, estimated based on regression analysis results, which were statistically significant in creating an additional private economic entity, micro-enterprise and employing an additional staff member in rural counties in 2012-2013



Source: Own calculations based on CSO data.

The correlation analysis and simple regression models were also used to examine the relations between the level of support and an increase in the number of economic entities in rural areas. Correlation coefficients between the level of support in 2007-2013 and the number of private economic entities, the number of micro--enterprises and the number of the employed in 2013 stood at 0.33 and were significant in all cases. In turn, the simple regression models developed explained an increase in the number of private enterprises, micro-enterprises and the number of the employed as a result of the transfer of EU funds at a very similar level as in the case of real property taxes or personal income taxes. These models were used to estimate amounts of support, which led in 2013 to establishing an additional private economic entity, micro-enterprise or encouraged the employment of an additional staff member (Figure 7.22). In accordance with these estimates, the greatest amount of support was crucial to the establishment of an additional private economic entity (over PLN 150 thousand). Over PLN 20 thousand less was necessary to launch a new micro--enterprise, as a result of using the policy instruments concerned. However, the creation of an additional work place with the help of public funds required spending nearly PLN 67 thousand.

8. Summary and conclusions

In the modern economy, macroeconomic conditions, globalisation and integration processes affect the development of structural changes. Theoretical and empirical research on structural changes in the economy indicates that certain trends are universal. Firstly, we can observe an absolute decline in the share of agriculture in the value added in the economy, employment, trade and consumption. Secondly, the decreasing importance of agriculture is accompanied by an increase in income. Thirdly, the share of primary agricultural products in the value of finished products follows a downward trend, thus increasing the value added in the food industry.

The Common Agricultural Policy and Rural Development Policy provide the examples illustrating the active interference of the state in the food economy and rural areas, with a view to attaining economic, social and environmental objectives. Various decisions influencing both producers and consumers, implying what should be produced, how and for whom, and outlining the decision-making process, are undertaken through the agricultural policy and focussed on the choices made by the public sector. Public authorities, acting through the agricultural policy, exert a direct impact on production resources allocation and on the redistribution of the financial means of both farmers and entrepreneurs. Nevertheless, the scope of state interference in the economy always raises controversy. The views on widely-understood intervention are prone to change with time, in line with "the pendulum theory". Society alternates between opting for more protective and more liberal instruments influencing agriculture and rural areas.

After the Polish accession to the EU, major changes took place in the formulation and implementation of the agricultural policy. They consisted mainly in systematising the policy objectives and increasing the expenditure earmarked for financing of changes in agriculture and rural areas. The inclusion of agricultural holdings in the CAP mechanisms contributed to the improvement in the income situation of most farmers. The fundamental significance for the increase in the level of the income of farms was held by subsidies (mainly in form of direct subsidies). The improvement in the competitiveness of agriculture is, however, dependent on the transformations of a structural nature (which precondition the improvement in the efficiency of utilising the factors of production) and the development of the whole national economy, especially in the context of the capacity for the creation of new jobs outside agriculture, also in the rural areas.

The structural changes taking place in the Polish agriculture, food industry and rural areas in the last decade became more dynamic [Wigier, Darvasi 2012, pp. 547-557]. Within the last decade there has taken place the dynamisation of structural changes occurring in Polish agriculture. As the most important should be recognised: a de-

crease in the number of farms with a simultaneous increase in the share taken by the largest farms; the decrease in employment in agriculture and the progressing concentration and specialisation of production. The size of the investment has increased noticeably, but their value still does not exceed the value of depreciation of fixed assets. The investments were mainly in machinery and to a much lesser extent in buildings and structures. However, there is a group of agricultural holdings which radically differs from the average picture in this respect. About 150-250 thousand agricultural holdings are able to invest in fixed assets. Despite these changes, the Polish agriculture is still characterised by a strong polarization of the agrarian structure.

The impact of individual CAP instruments is different [Czubak, Sadowski, Wigier 2010, pp. 41-57]. It ranges from the greatest impact – that of direct payments – to the slight significance of programmes supporting semi-subsistence farms or structural pension having only a minimal coverage. Combination of direct payments and cross compliance requirements causes that this form of support plays the key role in providing basic public goods through sustainable agricultural land management (maintaining environmental quality of the landscape, biodiversity, access to water, climate stability and air quality) or public goods not related to the environment (activity in rural areas) [Wigier 2013 c, pp. 3-19]. Currently, the level of direct payments reflects not only the historical level of production of supported activities, but also, to some extent, the differences in the economic situation of individual Member States.

The role of the CAP in the transformations of the Polish agricultural sector was and still is irrefutable, as evidenced in particular by a clear and sustained increase in agricultural income [Wigier 2013 a]. In the 2004-2012 period, an average of ca. 40% of agricultural income in Poland came from direct payments. Having analysed FADN data, it can be stated that the CAP impact on Polish agriculture is mainly reflected in higher agricultural producers' income, which is unquestionably due to covering the sector with direct support. However, its impact is twofold. On the one hand, direct payments increase farmers' income, ensure its stability and encourage agricultural producers to develop their holdings and, on the other hand, with limited land resources (especially of relatively good quality), they raise agricultural land prices, thus impeding this development. What is more, direct payments partially preserve the existing agrarian structure, as they are a safe source of income.

Nationally, the impact of EU support on agriculture varies between specific groups of holdings, depending primarily on their economic class (size) and, to a lesser extent, their production type (business profile) and region. Mainly households with a higher share of support in income (large and smallest holdings) or relatively higher income underwent changes after the EU accession. In spatial terms, they were observed in northern and western Poland. In the early years of membership, they primarily involved expanding the production area, mainly by means of lease and elimination of land taken out of agricultural production (fallow land, set-aside areas).

As regards this group of holdings, a change in their methods of production was observed – higher costs prove its intensification. Along with other instruments, they supported investments. On the other hand, a drop in livestock production was observed. Furthermore, there was a tendency to adapt production to maximise proceeds from direct support, especially in holdings with a lower level of support (horticulture, permanent crops).

While analysing changes throughout the regions, the expansion of agriculture in northern and western Poland ("Pomorze and Mazury", "Wielkopolska and Śląsk" regions and, to a lesser extent, the "Mazowsze and Podlasie" region) can be observed. The opposite process is taking place in south-eastern Poland ("Małopolska and Pogórze" region), as evidenced by the CAP impact on agriculture, which varies between the regions depending on their characteristics, i.e. mainly on the climate and soil conditions, the existing agrarian structure, the socio-economic situation and historical conditions. These factors, in particular the agrarian structure, are major determinants of a range of recipients of typical area subsidies (single area payments and complementary area payments) and, to a much lesser extent, LFA payments and others. Therefore, the structure of beneficiaries varies across the regions depending on the size of a holding, its location and business profile.

This would explain why, in spite of major changes, the agrarian structure remains largely fragmented and highly polarised. As a matter of fact, the impact on production (decoupling) is negligible, although the selection of activities to production to a certain extent reflects the list of plants, in respect of which certain payments can be granted. Market factors are of greater importance in this regard. Direct support indirectly influences agricultural investments, as the increase in farmers' income greatly improved their investment capacity.

Results coming from the analysis of survey data were mostly in line with trends defined on the basis of Polish FADN data. The CAP impact on production changes was minor and varied depending on the type of instruments. It was found that direct payments were an instrument having the largest impact on Polish agriculture, particularly on farmers' income. At the same time, the impact of CAP mechanisms on market stabilisation was marginal. Nonetheless, their impact on income stabilisation (mainly through direct payments) was more significant. The impact of other regulations on the Polish agricultural sector was negligible.

State aid played a significant, but less and less prominent role in the shaping of the pace and direction of investments in the food industry. Undoubtedly, it helped to strengthen the competitive position and increase export of the Polish food sector, mostly to the EU countries. The state, taking over the role of the regulator, led to forcing certain behaviour according to its intentions. It supported and to some extent showed directions of certain investments. However, the effect of substitution and income, generated by State aid programmes, leads to lowered efficiency. In terms of location of the

enterprise (urban/rural areas) the distribution of enterprises which took advantage of aid was fairly even, thus it is impossible to demonstrate a straightforward impact on removing disproportions in development. It is natural that urban agglomerations are the basic outlet markets for food industry enterprises. Rural areas are being activated through access to labour markets and the purchase of agricultural raw materials. Beneficial effects of investment policies have been observed in areas such as improving the competitiveness of some entities in the agri-food sector, adjusting to EU sanitary and veterinary requirements, and support for structural transformations as well as environmental protection. However, State aid does not guarantee equality and social equity. The type of "environment" (urban or rural municipalities) is a factor that strongly differentiates projects in terms of the value of the investment and the amount of co-financing. Investments implemented in towns are definitely much greater than those implemented in rural areas. Engaging public funds in private activity gives rise to the "crowding out" effect.

European agricultural policy has supported the market processes so far occurring in the food economy and in rural areas. Without it, structural transformations would be much slower [Wigier 2013 d, pp. 16-32]. The objective of the policy, which was originally aimed at building an economically strong agricultural holdings, changed over time and as a result of changing socio-economic conditions and was supplemented by other objectives, such as protection of the environment and the cultural heritage in villages, production of safe food, or multifunctional development of rural areas. Agricultural policy of the EU is flexible and adapted to the economic, social and cultural differences of its Member States. However, it does not lead to the unification of the agricultural holding model in Europe. European agriculture and villages remain varied, and, at the same time, competitive against each other, which proves that the market also has room for Polish agriculture. Conclusions for Poland, arising from the experience of the European structural policy, prove that financial resources from the EU funds, supplemented by own resources, will enable to establish a modern agricultural sector and improve living conditions in rural areas.

The structural and regional policies focused on the use of financial instruments have no positive impact on reducing inequalities in local development. This conclusion follows from the analysis of basic statistics and the Gini indices. It confirms the increase in diversity of counties in terms of economic development, regardless of the instruments used. Studies have confirmed to some extent, somewhat different effects of individual instruments on the differentiation of the pace of development. The results provide evidence for a thesis that the funds transferred under programmes involving direct and indirect support for enterprises contribute to accelerating the widening of the gap in local development.

Lack of effect of regional and structural policy in the form of closing the gap in the level and pace of local development should not be attributed to the unreliability

of the instruments used in the context of these policies. High impact on the process of deepening local differences is due to the initial state. This is because higher economic growth rate is achieved by counties with higher income. Quite a large group of counties has not yet reached that level of development to enable them to accelerate this development. This is a kind of confirmation of the Williamson's hypothesis at the local level. It seems justified, therefore, to say that the effective use of resources to address the differences in local development can take place only after the fulfilment of this criterion.

The growing diversity of counties in terms of the level and pace of development, determined on the basis of the analysis of basic statistics and the Gini coefficients, does not mean the absence of the process of reaching the state of long-term equilibrium by counties with lower levels of development. This way, the process of aligning the territorial units in terms of the pace of development and economic growth is accounted for in the statistical models of absolute beta convergence. The analyses conducted with this method show in turn, that there is a process of local convergence among rural counties, measured by own revenues of counties per 1 inhabitant of working age. The pace of this process is associated with the use of various types of financial instruments of regional and structural policies that directly or indirectly affect the development of entrepreneurship. The counties, which used such instruments, especially on a larger scale, achieved faster convergence to a state of long-term equilibrium. They also should halve more quickly the distance separating them from that state.

The effectiveness of regional and structural policy instruments, oriented on growth of entrepreneurship in rural areas should be assessed positively in the context of the analysis. They lead not only to improvement in the quality of life of residents, improvement in the level of economic development of rural counties, or local inducing of entrepreneurship, but also contribute to the convergence process at the local level. The instruments have in fact a significant impact on its pace. In other words, the main objective of the use of these instruments is achieved at the local level. It should be noted that convergence in rural counties occurs independently of the adopted definition of that term, i.e. derived from the regulation of the European Commission or literature. However, the convergence process should not be identified with the effectiveness of such measures, which was not analysed at this stage.

Based on empirical research on the impact of EU funds, which can be classified as instruments to directly or indirectly support the development of entrepreneurship in rural areas in 2007-2013, on economic processes, it is difficult to set a timeframe within which they will be reallocated to the most efficient entities. As a point of fact, they bring both measurable and positive economic effects in the current period. Analyses show that the higher level of support from the EU budget accelerates an increase in the number of private enterprises, micro-enterprises and the number of the employees. Moreover, it slows down the processes of growth in the number of the unemployed.

Nonetheless, the economic situation in a particular area can be improved thanks to the transfer of a given amount of public funds. Based on regression analyses, it can be said, for example, that the establishment of an additional private economic entity in a rural municipality takes nearly PLN 154 thousand acquired under different operational programmes. As regards a micro-enterprise, it is almost PLN 132 thousand, while the creation of one work place requires spending nearly PLN 67 thousand of public funds.

However, the existing relations in question should not lead to the conclusion that a significant economic improvement in rural areas can only be achieved as a result of a significant increase in the level of support, since it is impossible in practice due to budgetary constraints existing at both EU and national levels. However, the presence of statistically significant relations proves the efficiency of the instrument concerned. It can therefore be applied to support small-scale development projects in relation to the least economically developed areas if such an economic development concept is pursued.

The positive impact of financial support from the EU budget on the local economy is also proved by an increase in municipality's local revenues. In fact, municipalities obtaining relatively higher support enjoyed a larger increase in real property tax and personal income tax. In other words, the transferred funds generated a rise in both local community assets and population incomes, thus increasing the municipal tax revenues. Regression analyses reveal that every PLN 1 of public support, gained in 2007-2013, led in 2013 to an increase in municipal real property tax revenues by PLN 0.04, while in the case of municipal personal income tax revenues – by PLN 0.05.

When considering the possibility of using public financial support as an instrument for rural economic development, certain negative aspects should be kept in mind. In 2007-2013, relatively higher financial resources were transferred to more economically developed municipalities. Although they had positive effects, i.e. they accelerated economic development, their distribution under the same conditions can lead to the further diversification of rural municipalities in terms of both the level and rate of development. Thus, the distribution criteria applied neither foster the implementation of balanced rural development, nor promote bridging the gap in this development. However, they can be retained if another national development concept is pursued, such as establishing the so-called central units or growth poles. What is more, the positive effects of public financial support can be observed in the short term, i.e. during the period of transfer. In accordance with the existing theory, their positive impact on the local economic situation is supposed to weaken in the long run. Having ceased the use of this form of assistance, other instruments under policy to support the development of entrepreneurship are to play a greater role. In this case, fiscal policy and reduced bureaucracy can gain in importance.

Allocating resources by means of policy is negatively assessed, in particular since these funds are obtained, according to theorists, primarily by rent seekers, rather than efficient entities. Nonetheless, as representatives of certain economic trends

believe, allocating resources by means of policy may also have positive consequences. This view is shared especially by dual economy proponents. In their view, all forms of interventionism, which include subsidies for the activities of enterprises or farmers, slow down the allocation of resources to the most efficient economic entities. Nevertheless, they thus provide time for the weakest entities to adapt to market requirements.

In conclusion it should be noted, that the best mechanism for increasing the effectiveness of management is the market mechanism. It is responsible for the pro--effective selection of economic entities by awarding strong producers who lower the costs and are flexible in adapting to new market conditions. In its essence, the market has, however, certain weaknesses. Governments try to apply an intervention policy that prevents the development of crises. However, such a policy is usually implemented with some delay in relation to the market effects that have already arisen, which sometimes augments unfavourable macroeconomic phenomena. It also disturbs the logic of market functioning, as it gives rise to inevitable contradictions in regulatory mechanisms, weakens the motivation of market actors to engage in effective action, most often only generating adaptability effects manifested in the pressure on further interventions, more and more favourable to those actors, or even generates high costs of intervention, borne by the consumer and the tax-payer. The global experiences prove that the market and the state have to co-exist and state intervention should be always limited to market support and should not replace the market. Intervention policy should also be of ex-ante type rather than of ex-post type, because the state should anticipate and take pre-emptive action, rather than limit its role to that of a "fireman extinguishing fire".

In the future, the priority of State aid designated for the agricultural sector and for the rural areas should still be investment and development activities. Reconstruction of agriculture should be supported, by maintaining its dual model based on holdings that produce goods, are competitive, provide a living for their owners and on smaller holdings with diversified sources of income. The overarching objective should be to improve the competitive position of the agri-food sector and rural development. The condition for more dynamic structural changes in rural areas is fast economic growth.

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