

POLITICAL RENTS OF EUROPEAN FARMERS IN THE SUSTAINABLE DEVELOPMENT PARADIGM

International, national and regional perspective

Edited by
Bazyli Czyżewski



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Preface

(Bazyli Czyżewski¹)

This book has been prepared by a team of researchers from six renowned academic centres in the field of agricultural economics in Poland², under a National Science Centre research grant titled “Political rents in the European Union’s agriculture – comparative analysis basing on the UE27”. It aims not only to extend the paradigm of sustainable development and the concept of political rent, but also to present the results of empirical studies carried out using data from 27 EU member states for the years 1995-2014 (some of the analyses also go back to the 1950s) together with Polish case studies. Viewing the EU’s Common Agricultural Policy from the standpoint of the theory of rent seeking is a relatively uncommon approach, particularly as the authors draw attention to the need to predefine the concept of political rent received by farmers in a situation where they are supplying public goods. The book can thus be said to some extent to fill a gap in existing research at the boundary between agricultural and political economy. The approach proposed by the authors may be all the more interesting since it presents issues of agricultural policy and political rents in agriculture from the point of view of a new EU member country, while the existing literature on the topic is dominated by analyses carried out by researchers from the old EU-15 members.

The book is divided into four parts, forming a logical sequence. Part 1 is of a theoretical nature, and presents an original conceptual approach to sustainable agriculture, land rent and political rents. These concepts are then tested empirically in the subsequent parts of the book, which adopt, respectively, an international, national and regional perspective. The research goal is to develop the theory of rent seeking and adapt it to the paradigm of sustainable agriculture and, more broadly, to that of sustainable development in general. The deliberations of the authors of the individual chapters, taken as a whole, serve to verify several research hypotheses:

- 1) the conceptual approach to political rents in agriculture is incomplete, because it does not take account of the process of creation of public goods in agriculture and the need to apply correction to the market in that sector;
- 2) political rents in sustainable agriculture fulfil a new role, which goes beyond the rent-seeking concept;

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- 3) despite the existence of a Common Agricultural Policy, the political rents received by EU farmers are highly differentiated at national and regional level – there exist national models of rent seeking;
- 4) the European Agricultural Model is not a universal development model for EU agriculture given the existing large disproportions in rent seeking between countries.

To introduce the reader to the topics addressed in the various parts of the book and the logical relationships between them, a brief summary of each of them is given below.

Part 1: the paradigm of sustainable agriculture, land rent vs. political rent

The first part of the book presents the theoretical foundations for the paradigm of sustainable agriculture and some key concepts related to it, namely land rent and political rent. In Chapter 1.1 the authors draw attention to three key questions in the theory of sustainable agriculture: the intrinsic utility of land, and the absolute and relative deprivation of farmers. The question of intrinsic utility of land, affecting the balance of inputs and outputs, is highly inspiring. Rents of well-being of the natural environment remain an unknown factor in the value of land. We may assume that the basic relation of capitalism is defined by the ratio of capital (assets) to income. How, though, should one approach land as a natural resource, and in particular the virgin land which the human species inherited? Land, though treated as an asset, is not a capital accumulated by people. It has an intrinsic value, which has been improved over centuries of use. This value, in the historical process of intersectoral flows, has been capitalised to varying degrees, altering the aforementioned relationship of capital to income. As regards the second question: at the root of the absolute deprivation of farmers lies the immobility of the land factor relative to the other factors of production – labour and capital. As a result, the economic surplus created on farms is partly captured in the supply chain by commodity purchasers, processors, sellers, and finally consumers. The authors refer to this process by the original term “surplus drainage”. Particularly notable, however, is the fact of the relative deprivation of farmers, quite common in many highly developed European countries, whose theoretical causes are not entirely clear. It is appropriate in this regard to consider the question of how the sense of relative deprivation is related to the land capital that farmers have accumulated.

Chapter 1.2 describes the evolution of the 18th-century land rent into contemporary political rent. The contemporary significance of the category of land

rent is not reflected in the body of research work on that topic. The authors take the view that in the present era of transformations in the agricultural model of developed countries, there is a need for a new concept of land rent. The neoclassical theory of rent is insufficient to describe the reality, because it reduces the sources of land rent to the inelasticity of supply of land and the discounting of rental prices. Under the paradigm of sustainable agriculture, however, the land rent discounted in average land prices is significantly higher than the value of the rental price. Why is this? It is suggested that, at present, the reason for the existence of land rent is more and more often the intrinsic utilities of the land, which cause the expected productivity of capital in agriculture to be higher than in related sectors. These expectations are linked to a large degree to the political rents received by agriculture, and hence to the phenomenon of rent seeking, but this is not the whole story.

We thus come to the concept of political rent as explained in Chapter 1.3. The methodological individualism that characterises the neoclassical approach often neglects the benefits and costs resulting from collective actions. For this reason, contemporary agricultural policy is also a topic of interest to political economists and the public choice theory. The author of this chapter attempts to explain the basic concepts of rent-seeking activities and the interest group theory, which might be useful in explaining the high level of support for agricultural commodity producers in Europe. This chapter is purely descriptive, and its main objective is to review the basic concepts of the public choice theory with regard to agricultural policy. Hence it explains the mechanisms of rent-seeking behaviour and its consequences, reveals the idea behind the interest group theory, which may be useful in analysing lobbying activity in agricultural policy, and seeks empirical evidence in the contemporary subject literature.

Part 2: sustainable development of agriculture and political rents – international perspective

In view of the growing population and limited land resources used for agricultural purposes, global agriculture is required to perform the function of producing food while at the same time minimising its impact on the natural environment. In Chapter 2.1 an assessment is made of the sustainability of agriculture in the European Union compared with agriculture worldwide. Account is taken of issues relating to economic, social and environmental balance, against a background of resource-related and structural conditions. The essence of sustainable agriculture should be its durability, which is dependent on its environmental friendliness, social acceptance and economic effectiveness. In addition to these assumptions, it should be noted that, alongside the neoclassical allocation effectiveness, adaptive effectiveness is also important for the

sustainable development of agriculture. Adaptive effectiveness comes to light in the long term, and is linked to the flexibility of institutional structures. It is manifested as the ability to accumulate knowledge and to instigate supranational forms of cooperation. According to FAO estimates, given the expected growth in the global population to 9 billion by 2050, it will be necessary to increase agricultural output by at least 60% (FAO 2015). In this context it may be asked, on the one hand, whether contemporary agriculture is capable of ensuring a secure supply of food at present and in the future, and on the other, whether this objective is compatible with its sustainable development. One can find the answers to these questions in the different strategies and policies for a bioeconomy, which began with the publication of a bioeconomic policy agenda by the Organisation for Economic Co-operation and Development in 2009 (OECD 2009). Since that time, many documents have been produced indicating strategic directions for action to develop a bioeconomy, at regional as well as national and international level. In Chapter 2.2 an assessment is made of the European Union's bioeconomic strategy, based on EU programming documents. Attention is drawn to the differing understandings of the concept of a bioeconomy that are found in the literature and in programming documents, at both national and EU level.

The aforementioned "adaptive effectiveness" is also manifested in the evolution of the institutional measures applied under the EU's Common Agricultural Policy (CAP). The aims and principles of the CAP were formulated in the 1950s. Since that time, the changing internal and external conditions under which farming activity takes place have led to successive reforms of the policy. The change in the priorities of EU agricultural policy is reflected in the instruments applied, which have evolved from price-market intervention into direct support for the incomes of agricultural producers and for the development of rural areas supplying public goods. An interventionist agricultural policy distorts the market, among other things through higher prices obtained by agricultural producers in the EU. Differences in prices can be considered a symptom of political rents, which are perceived as a cost of maintaining the viability of the European agriculture. This aspect of political rents in EU agriculture is analysed in Chapter 2.3. The study is based on a set of synthetic indicators of support for agricultural producers (NRA) developed by the World Bank, analysed on a dynamic basis against the background of the evolution of the CAP instruments. The authors address the questions of whether the CAP now has less of a distortive effect on world prices (causes less destabilisation of global agricultural markets) than it did in the past; whether this means that agricultural producers in Europe are losing competitive advantage with respect to other parts of the world and to what extent this applies to particular EU members, having regard to the division between the "old" EU-15 and the "new" EU-12; and whether this poses a threat to the viability of European agriculture.

An alternative to the NRA support index is the PSE (Producer Support Estimate) measure calculated by the OECD (OECD 2010). This indicator, however, is computed and published for the EU as a whole, blurring differences in the political rents obtained by individual member states. This is of particular significance for the new countries of the EU-12, where since their accession in 2004 the level of support has been identified with the EU level, although in reality even the process of transition to full direct payments was not complete until 2013. A dilemma arises, of importance for both economic theory and practice, of whether the huge variety of institutional measures applied at national level can be represented by means of a single model of transfers of economic surplus to agriculture. After all, in evaluating the mechanisms of support, account should be taken of macroeconomic conditions, the significance of public goods, the power of interest groups, and the elasticity of the supply side in agriculture and the whole of agribusiness in a given country. For this reason, the authors of Chapter 2.4 computed their own indicator, the Farm Receipts Gap Estimate (FRGE), for individual EU countries based on the assumptions adopted for the computation of the aforementioned PSE index. This indicator, apart from the price gap reflected by the NRA, also takes account of changes in revenue caused by fluctuations in the supply of agricultural raw materials. A study was conducted of the financial system of support for agriculture in fourteen EU countries – Belgium, the Czech Republic, Denmark, France, Spain, the Netherlands, Ireland, Germany, Poland, Portugal, Slovakia, Sweden, the UK and Italy – between 1995 and 2012. However, neither the NRA nor the FRGE is an ideal measure of political rents, because they are based on highly restrictive assumptions, including perfect competition, absence of transaction costs and absence of public goods, which are at variance with the concept of political rent described in the first part of the book. If it is possible to compute what part of the political rent compensates for market imperfections in agriculture and the supply of public goods by farms, then the aforementioned indicators should be adjusted accordingly. This matter is taken up in the next part of the book.

Part 3: towards valuing political rents – national perspective

The authors promote the viewpoint that in analysing the political rents of farmers, defined as in Chapter 1.2³, account must be taken of three processes: long-term flows of surplus from agriculture to other sectors due to the flexibility of

³ As economic rents, that is, surplus income in excess of the alternative cost of production factors, obtained by way of political decisions. These rents result from restrictions on the free operation of the market mechanism (Krueger, 1974) and cause the wastage of resources and loss of well-being.

agricultural prices, payments for public goods, and taxation of agriculture. Long-term depreciation of agriculture through a price mechanism (i.e. the constant exacerbation of the price scissors effect, or price gap, in agriculture) gives rise to a number of adverse social and environmental effects. This process must therefore be offset by the retransfer of income to agriculture under agricultural policy. As regards public goods, there does not exist any more effective way of ensuring the constancy of their supply than through subsidies (institutional valuation). Naturally, the subsidisation of agriculture needs to be analysed in net terms, taking account of the taxes paid by farmers. Considering the issues in that order, we come on to the complex question of the measurement of political rents paid to agriculture in EU countries.

Agriculture is a sector of the economy in which cyclical economic fluctuations are particularly marked. These are linked on the one hand to features of land as a production factor, and on the other to the low price and income elasticity of demand for food products in conditions of forced consumption. Therefore, in the long term, there is a “drainage” of added value from agriculture to the processing sector, chiefly through a price mechanism, as losses from a period of downturn are not compensated by rents in the period of upturn. In Chapter 3.1 the authors construct a synthetic indicator of the economic situation in agriculture based on the values of flows of economic rents in agribusiness (from and to agriculture) linked to changes in sectoral prices and inflation, in the form of an input-output table. The developed indicator was tested in relation to the EU-27 countries, in order to evaluate the production decisions of farms in conditions of flexible prices of products sold in different phases of the economic cycle in agriculture. The drawing of conclusions about the economic cycle based on flows of economic rents is an atypical approach, but one that helps identify the causes of fluctuations in productive activity on farms and enables their scale to be compared between countries.

In Chapter 3.2 the authors review the literature with regard to the concept of the supply of public goods by agriculture. They then make a division of CAP subsidies according to their function, indicating those which are intended to finance public goods. They use cluster analysis to identify EU regions which differ significantly in terms of the structure of budgetary subsidies to agriculture. It is considered to what extent this is a permanent division, and whether convergence is taking place between regions as regards the support structure.

European agriculture receives subsidies on the one hand, but on the other it is burdened by various taxes. Taxes levied on agriculture in the EU include taxes on income, assets, and consumption. The systems are quite similar to each other in terms of types of taxes, the rules for determining the basis for their calculation, the rates applied, and tax preferences. In Chapter 3.3 a comparison and evaluation is made of the tax systems applicable to agriculture in selected EU countries, based on

a synthetic valuation measure. Valuation was performed with respect to the structure of the tax systems applied in agriculture, in particular the number of different taxes included in the system. A valuation was then made of the methods of determining the income tax base in the analysed countries. What was primarily evaluated here were the differences in treatment of the supplementation of farm income by income from other sources, and the various types of allowed deductions from the tax base. The next step involved an evaluation of tax rates, and finally of the preferences applied in the analysed countries' tax systems with respect to agriculture. By summing the values of the features of the tax systems applied to agriculture, a synthetic indicator is obtained. The convention is adopted that a lower value of the indicator implies a more preferential tax system, while a higher value implies more restrictive taxation of agriculture. The analysis enabled the identification of a group of countries in which agriculture is taxed more preferentially.

The foregoing considerations of flows of surplus in agribusiness, payments for public goods and taxes in EU agriculture are brought together in Chapter 3.4, which discusses whether the concept of political rent in terms of the theory of rent seeking is conceptually appropriate to contemporary agricultural policy in the EU. By definition, political rent is inextricably linked to the wastage of resources and to exclusive benefits provided to selected social groups at the expense of others. It is generally believed that agricultural interventionism under the Common Agricultural Policy represents the payment of political rents to farmers. The authors attempt to show that the concept of political rent within the rent-seeking theory is not valid for agricultural policy. It is not justified to identify the whole of the subsidies paid to agriculture in the EU as a "political rent", since political rents cannot be taken to include payments for the supply of public goods or those transfers which compensate for market imperfections. A methodology is proposed for valuing these items, filling the gap existing in the literature on political economy. The authors perform comparative analyses with the aim of calculating the "pure political rent", based on input-output matrices for representative farms according to the EU-FADN typology for the period 2007-2012 and all EU-27 countries.

Part 4: how to measure and how to support sustainability in agribusiness – regional perspective

The fourth part of the book contains four case studies. The authors begin by raising the question of what sustainability means and how to measure it in practice, particularly on a local scale (4.1). Sustainability should be perceived as enjoyment of any good or service that contributes to well-being, including things freely provided

by nature like forest products and beautiful sunsets. Sustainability is usually measured based on a very broad view of capital (the UNECE methodology), i.e. including five equally important individual stocks: financial capital (stocks, bonds and currency deposits), produced capital (machinery, buildings, telecommunications and other types of infrastructure), natural capital (natural resources, land and ecosystems providing services like waste absorption), human capital (an educated and healthy workforce), and social capital in the form of functioning social networks and institutions. However, at the regional level these indicators usually do not tell us much about how well a system is progressing in terms of the goal of sustainability, as it is difficult to reflect the specific regional situation. According to some researchers, measuring sustainable development at the national level, based on national-level data, may fail to capture critical issues at the regional level. Therefore, although a general approach might be followed, it is necessary to design certain individual indicators that are adequate to the problems of a particular region. In Chapter 4.2 the author combines the aforementioned UNECE individual stocks into three equally important components: an economic component, natural capital, and a spatial component. However, in choosing the indicators, the INSURE methodology was also taken into account, with values fitting within the framework of the triple bottom line (people, planet, profit). Hence an original methodology was adopted for measuring the level of sustainability, applied to a case study of the Wielkopolska region in Poland.

There are different approaches to quantifying “sustainable capital stocks” in agribusiness. Intellectual capital in agribusiness is often referred to as a wealth or asset of an organisation, and is perceived as a factor driving the global economy of the future and at the same time as a key to success in the 21st century. It is therefore extremely important to research the intellectual capital of an enterprise, in terms of both the transformations taking place in organisations and the identification of non-material assets of individual firms. Many ways of measuring intellectual capital have been proposed in the literature, and these are considered in detail by the author of Chapter 4.2. They include market capitalisation methods (MCM), methods based on return on assets (ROA), methods involving the measurement of direct intellectual capital (DIC), and scorecard methods (SC). Chapter 4.2 describes the concept of intellectual capital and selected methods for measuring it, from both theoretical and practical perspectives. It presents the historical context of the problem and a description of the importance of action taken to measure intellectual capital by certain business groupings, namely KSG Agro SA, Industrial Milk Company SA and Kernel Holding SA. The development of common uniform analytical models will make it possible to improve the quality of capital management and also to improve competitiveness.

Having shown how it is possible in practice to measure both the sustainability of agribusiness on a regional scale and its key components (intellectual capital), we investigated the question of how this process is supported by economic policy. This subject is taken up in Chapters 4.3 and 4.4. We identified two channels of support for the sustainable development of agriculture: through land value, and through the income of farms supplying public goods. The first case study concerns the problem of to what extent agricultural policy currently causes variation in land prices and is capitalised in the value of agricultural land. A fundamental problem is that it is hard to quantify all non-agricultural amenities associated with land and to find comparable measures for them. It is thus necessary to seek appropriate aggregates for environmental and urban utilities. The authors attempted to fill the gaps in the subject literature by means of a wide-ranging study of the drivers of agricultural land value in Wielkopolska, a leading agricultural region of Poland. The aim of the research is to determine how payments for public goods are capitalised in the value of land.

Another channel of support for sustainability is through the incomes of farms supplying public goods. This applies in particular to farms offering agrotourism services. Rural areas are undergoing an evolution in terms of the functions that they perform. While in the 1980s the productive function (agriculture) was still dominant, at present touristic and recreational functions are becoming increasingly important. Consequently, there is a growing interest in the development of agrotouristic activity both among farms and among local authorities in Poland. Such action is also supported via instruments of the EU Common Agricultural Policy. Public goods, which increase the value of the landscape and the quality of life in rural areas, should provide a stimulus to create agrotourism farms based on their value. They thus make it possible to better utilise the labour factor and to diversify economic activity, while at the same time increasing the income of local authorities. Support for the process of supplying public goods is thus seen as the creation of attractive employment in rural areas for workers with qualifications in agriculture, horticulture, food processing and services for the food industry. It is therefore a source of benefits both for private entities functioning on the basis of public goods, and for whole communities, which obtain additional income in various forms (at the primary, secondary and final stages of the division of municipal income). Whether this happens in reality is shown by the case study in Chapter 4.4, where the authors attempt to model the impact of the links between naturally occurring public goods and the incomes of agrotourism farms and local authorities.

Part 1.

The Paradigm of Sustainable Agriculture – Land Rent Versus Political Rent

1.1. Research challenges for agricultural economics in the new paradigm

(Andrzej Czyżewski, Bazyli Czyżewski⁴)

Introduction

In contrast to the economics of labour and capital, agricultural economics has to deal with the land factor and its distinctive feature of immobility, which refers to the impossibility of transferring soil to non-agricultural uses. We make the assumption that a research procedure should provide not only description and comparison, but also valuation and recommendation. Economics, according to Tomáš Sedláček, can be divided into good and bad (Sedláček 2012). We agree with that view. Much depends, however, on the institution that puts into practice the ideas of the governors elected by the governed. Consequently, we treat agricultural economics not as economics in a pure sense, usually limited to description and explanation. The general laws of the discipline of economics, determining the state that is and that should be, are in this case not entirely adequate to our needs. Economics develops through the creation of new paradigms with differing systems and hierarchies of values, going beyond the hitherto existing fields, schemes and investigative methods. In every paradigm there are laid foundation stones on which new concepts are built. In contemporary economics there are several of these. Here we intend to introduce those which, in our view, will play a leading role in the coming decades. Today these are at best noticed, and in some cases “extracted”, but closer knowledge of their nature and relationships is still obscured by a fog of enthralling mystery. This exerts an attraction, despite the risk of committing the sin of immodesty in the face of the unknown. We select three issues for consideration:

- the contemporary reinterpretation of economic rents in the food economy, taking account of the question of the intrinsic value of land;
- the problem of absolute and relative deprivation – that is, the impoverishment of farmers;
- the need to change the industrial-technological model of development currently dominant in agriculture into one of sustainable development.

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The foundation stones of the paradigm of sustainable agriculture

In expanding on the aforementioned questions, we wish to note that the problem of the intrinsic value of land, affecting the balance of intersectoral flows of agricultural raw materials and food products, is a highly inspirational one. The rents of the welfare of the natural environment remain a mysterious factor in the value of land. We follow Thomas Piketty in assuming that the basic relation of capitalism is defined by the ratio of capital to current income, and that this ratio is regulated by the rate of return on capital and by the relationship of the rate of saving to the rate of increase in income. We must conclude, then, that a basic condition for the development of capital is financial and material accumulation (Piketty 2015). How, though, should we approach land as a natural resource, and in particular the virgin lands that the human species has inherited? Land, counted as an asset, is not, after all, a capital accumulated by people. It has an intrinsic value, which over centuries of use has been improved – through drainage, irrigation, ploughing, clearing, enclosure, and the like – but the root of which lies beyond our knowledge. There would be nothing unusual in this, except for the fact that it is this value, in the historical process of intersectoral flows, which is, to varying degrees, capitalised, bringing about significant change in the aforementioned relationship between capital and income. The point is, however, that the origin of these processes goes back to “pure”, intrinsic values, the measure of which also changes over time. The question arises: what is the contribution of these values to the growth in the ratio of capital to income and its dynamics, and what economic consequences does that relationship have in the contemporary world? Is it possible at all to compute the intrinsic value of land in market prices, and what would be the sense, economically speaking, in doing so? This is the mystery associated with land. It is certain that such a value exists. The distinguished scientist Professor R. Manteuffel originated this line of thought in his *Philosophy of Agriculture* (Manteuffel 1987).

As to the second question – at the root of the absolute deprivation of farmers (and their farms) lies the immobility of the land factor, in contrast to the other factors of production: labour and capital. Land as an asset does not move to other uses. The process of the formation of intermediate and final demand involves only its rent, and that to a highly inadequate degree, in view of the absence of the internalisation of many costs, such as the maintenance of the welfare of the natural environment. This has been pointed out, for example, by A. Woś, in his last work dealing with the valuation of resources and production factors of agriculture (Woś 2006). The facts discussed here imply that the economic surplus created on farms does not fulfil the criterion of optimum allocation in a Pareto sense in the table of intersectoral flows. In the supply chain this surplus is partly captured by purchasers, processors,

vendors, and finally consumers. According to empirical research conducted in Poland and Europe based on a sample of FADN farms, that deprivation certainly arises over a closed economic cycle, the phenomenon being markedly more intense in the downward phase of the cycle than in the upward phase (Czyżewski B. 2013; Czyżewski 2016). A consequence of this state of affairs is the need for that part of the generated economic surplus which has flowed away from its original creators to be restored by way of a mechanism for redistribution of the income of taxpayers – formerly through both the market and the central budget, today chiefly through the budget, including in the form of subsidies provided for various reasons and grants supporting farmers' income. This provides compensation for the market's discrimination against agriculture, and is an important justification for agricultural policy as currently implemented, including the European Union's Common Agricultural Policy. Without such redistribution, farmers' income would be placed in increasing disparity with other sectors of the economy. Detailed research has shown that the more economically developed a country is, the more common this becomes (Czyżewski, Kułyk 2010). According to Polish experience, however, the budgetary compensation for the deprivation of farmers' income is insufficient. The disparity between agricultural income and average household incomes still persists, although it has been significantly reduced by Poland's membership of the EU (Goraj 2009). It should be noted, however, that in the "old" EU-15 member states the level of this disparity averages around zero, while in countries such as Japan and the United States it is clearly positive (Czyżewski, Kułyk 2010).

Of particular note, however, is the fact that relative deprivation of farmers is fairly common in many highly developed European countries, where the level of agricultural incomes is much higher than in Poland, but is still noticeably lower than the level of average household incomes in those countries. It should be noted that agricultural incomes in many highly developed EU countries, without financial support from a budgetary redistribution mechanism, would be insufficient to pay the current costs of agricultural production. Here, however, we would like to share a reflection concerning the need, in explaining that mechanism, to include an evaluation of the relation of the capital accumulated by farmers, including accumulated assets (houses, farm buildings, equipment, machinery, and finally land), to incomes. It should be borne in mind that in highly developed economies the ratio of capital, understood in this way, to income is estimated at around 5–6 (Piketty 2015). It might nonetheless be asked whether the shaping of agricultural incomes should be decoupled from farmers' accumulated capital. In what circumstances is this important, and what might the consequences be for their economic choices?

The last of the questions listed relates to the need for the industrial-technological model currently dominant in commercial agriculture to be replaced with sustainable development. We are aware that this would not be a simple switch, but a process of approaching a goal, which itself is not static. There is, after all, a need to balance economic, demographic, environmental and social needs in such a way as to minimise errors of composition. There is a need for appropriate rules on interaction between the new institutions and instruments. It is hard to say when that process will achieve a critical mass, on a continental and later a global scale – it will certainly not happen simultaneously everywhere, and the time differences may be significant. One thing is certain, however. The existing mechanism, stimulating the technical effectiveness of production without internalising the accompanying transaction costs and reducing the wellbeing of the natural environment, must be changed (Zegar 2012). Stimulation of the scale of agricultural production in conditions of falling unit purchase prices, and the consequent relative fall in the marginal incomes of farmers, becomes economically pointless. When to this we add the increasing costs of production, due to the need to pay the rent of the welfare of the natural environment, the introduction of a policy of sustainable growth becomes essential (Czyżewski A., Czyżewski B. 2015). To live, people need not only food, but also a healthy natural environment. The eutrophication of water, steppe formation, green belt loss, as well as excessive emissions of methane and carbon dioxide, lead to ever more vocal social objections, particularly in areas where the development of civilisation is advanced. The time is therefore approaching when a general environmental levy will have to be paid – a special tax to enable the preservation of the natural environment for future generations. It is less important that we speak today of the shift to sustainable growth as a process rather than a single act; what matters is that the process has begun and will intensify. Does this mean that over the coming decades food will become more expensive? Perhaps, but much depends on the effectiveness of biological and technological progress, which must nonetheless take account of the need for permanent integration of the different aspects of economic growth.

The industrial model of the development of agriculture vs. the sustainable agriculture paradigm⁵

The challenges faced by agriculture today are integrally linked to the rejection of the assumptions of neoclassical economics as advocated in the economics of agriculture (Woś, Tomczak 1983). Continuing to ignore the role of the environment in the provision of materials, raw materials and waste collection, as is done in present-day agricultural economics, makes it impossible to run business operations,

⁵ The following thesis has also been presented in (Czyżewski A., Czyżewski B. 2014)

while the assumption that people, in striving to satisfy their own needs, inevitably contribute to achieving a public good is counterfactual. Entities oriented towards profit maximisation show a strong tendency to externalise environmental costs, which are not always possible to express in monetary categories (Tietenberg 2006; Solow 1974; Daly 2007). Thus the central dilemma of the new agrarian economy concerns the necessary relative limitation of the production efficiency of the industrial model of development (Wojtyna 2008) in favour of improving the quality of life as part of a socially and environmentally sustainable new management paradigm (Zegar 2012). It requires full recognition of the social and environmental costs of production, and the rejection of rules which lead to the degradation and decline of natural resources. These premises imply a need to depart from the hitherto implemented “industrial” economics of agriculture towards a new economic order, the growth of which limits are determined by the ecosystem in the conditions of a sustainable scale of production. Then the desired distribution of resources, to be implemented by way of a market mechanism to ensure effective allocation, will be specified by adopted rules and instruments (Zegar 2012). This allows the new agrarian economy to take into account the optimum relations of production scale and the natural environment, which would guarantee the sustainability of the management process, while natural resources would not be treated equally with anthropogenic capital. Such an understanding of the concept of full flows of inputs and effects will make it possible to determine whether the possibilities for renewing a specific ecosystem are exceeded, or as J. S. Zegar puts it, whether the final growth utility is lower or higher than the scale of lost profits. The problem with the new paradigm of agricultural economy lies in the fact that it assigns intrinsic value to natural capital, going beyond the classical understanding of land rent (Czyżewski B. 2010). In the economics of agriculture it is no longer sufficient to view processes only from the perspective of capital and labour (Woś, Zegar 2002). The assumption of the inexhaustibility of natural resources and unlimitedness of the global ecosystem, which today is seen as clearly counterfactual, can no longer be accepted. Neglecting the significance of the land factor, as is done in the Cobb–Douglas function, can be considered as an intellectual exercise, but not as a management practice. This factor determines a number of public goods and services which are essential to human existence. The estimation of the demand for these according to non-commercial (designed) prices will therefore soon become a necessity, allowing the opposition of market competitiveness against social competitiveness, which emphasises the divergence between micro- and macroeconomic criteria.

With prices, a market mechanism based on the triad of ownership and supply- and demand-related regulation creates demand for money (Wilkin 1995). In reality, this leads to the concentration of production to lower its unit costs, and the obligation

to increase labour efficiency as a condition for obtaining competitive advantage (Hayami, Ruttan 1985). In reference to agriculture, it represents growth in the production of agricultural raw materials in conditions of growing pressure on the natural environment. Ensuring a secure supply of food to consumers requires not only a larger food supply, but also lower prices of agricultural raw materials. This, in turn, has had a negative influence on the incomes of farmers, who, by producing greater quantities of cheaper food, earned incomes significantly lower than the average for households outside agriculture (Schulz 1964, 1968). However, considering the immobility of the basic production factor, namely land, and the non-portability (massiveness) of the property invested within holdings, they were unable to perform allocation in a Pareto sense or effectively use substitutions of production factors (Czyżewski 2003). All they could do was increase efficiency in conditions of falling purchase prices. This, in turn, required progress in production technologies, including machines, devices and innovations; in short, a permanent upgrade of farming. This dictatorship of the need to upgrade farms and make them more efficient did not take into account the full costs of production processes. Unfortunately, the balancing of such unfavourable production factors as soil degradation, disturbance of the water balance, CO₂ emissions, eutrophication of water courses and reservoirs, and steppe formation, did not come about. The welfare of the environment was not subject to valuation, as a result of which the need to internalise costs was not reported. It was the “technological treadmill” that prevailed (Thirtle et al. 2004; Czyżewski 2013). What is more, another mechanism of economic depreciation of agricultural holdings was involved. It turned out that despite the higher costs of upgrading and employment of new technologies and technical progress, the share of the standard economic surplus in a product’s price was lower. This was a consequence of a situation where the market witnessed a concentration of buying-in, processing and disposal of goods, resulting in the appearance of larger processing and commercial corporations which, competing with each other, won over consumers with lower prices (Zegar 2012). This was a path to the realisation of the assumption that a relatively larger turnover of goods would bring profit high enough to ensure that minimisation in the price of a single product would not be an obstacle to the implementation of processing and agricultural marketing. The paradigm of industrial agriculture based on the above-described mechanism was accompanied by market failure, which stimulated the development of oligopolist and monopolist structures in supplier-customer relations. As a result, this model of agricultural development failed to meet two basic goals of contemporary management – firstly, it was unable to secure the parity of agricultural incomes to farmers, limiting the generated economic surplus in intra- and intersectoral financial flows (Czyżewski A. 2009; Czyżewski B. 2009a); and secondly, with the increase in the scale of industrialised agricultural production, it

continued to depreciate environmental conditions, failing to internalise the external costs of agricultural production (Zegar 2004). The welfare of the environment and its ecological balance continued to suffer. It should also be stressed that in these conditions economic surplus was transferred from agriculture through a buying-in intermediary, processing entity, sales link, to the consumer, whereas its retransfer to agriculture was quite risky if not supported by interventionist policies of the state, for which the need to transfer the economic surplus back from consumers to farmers became a primary goal (Czyżewski 2007). The experience of the European Union's Common Agricultural Policy shows that reimbursement of the surplus (via market price support) significantly destabilises the market. As a result of the evolution of CAP rules and instruments, it has consequently been accepted that interventionism via instruments intended to implement agricultural policy will take place from the consumer, through the budget, to the farmer, with the possible bypassing of a market exchange mechanism. Contemporary empirical research on individual holdings (according to data from the Polish Central Statistical Office) proves that, as per account balance, under different conditions of the business cycle, approximately 10% of the economic surplus (Czyżewski B. 2013; Czyżewski B., Mrówczyńska-Kamińska 2011) is transferred, purely as a result of the failure of market mechanisms (flexibility of agricultural prices), from the farmer to other sectors. The assumption that faster industrialisation would lead to a solution to the persistent agrarian problem (Czyżewski A., 2005; Wilkin 1986) turned out to be an illusion, while the "engine" of industrial agriculture ran up against an environmental barrier, preventing a further exclusion of agricultural production processes from natural conditions, which resulted in an intensive use of means of industrial origin, an excessive concentration of production and an increase in its scale.

Therefore, a progressive integration of agricultural holdings with the agribusiness environment requires a new development paradigm, if only because of the need to internalise the external costs of agricultural production, considering the inability of ecosystems to recreate them. It turns out that agriculture must be subject to the superiority of an ecological system, while an economic system should be regulated by adequate social solutions. The fact that the capacity of ecosystems today has been exceeded by one-third entirely discredits the idea that nature as a "machine" is worth the same as it is worth for a human. Even accelerated scientific and technological progress cannot disprove this thesis. The transformation of agricultural development from an industrial model back to a sustainable one is inevitable in the long term, while the imposition of inhibitors of an ethical and social nature on the mechanisms of industrial development of agriculture is becoming a necessity. Witnessing the popularisation of the paradigm of sustainable agriculture and supply limitations, it will be easier to overcome the barrier of demand for food. Its rigidity and restrictions

will obviously still be there, and its flexibility against incomes will remain low. Nonetheless, agriculture's adaptive mechanism will be to a larger degree oriented towards the allocation of production factors in accordance with the requirements of the natural environment and its welfare. Internalisation of the full costs of agricultural production in conditions of rising prices of agricultural products (accompanied by lower supply) will enable improvement in the financial situation of holdings, releasing the so-called "income pliers" which exclude holdings from participation in market activity owing to barriers hampering the flow of fixed assets (the resisting arm) while limiting holdings' market depreciation (clamping arm) (Zegar 2004; Bywalec 1995). In the absence of an automatic mechanism compensating for income depreciation in the industrial model of agriculture's development, the sustainable model is more beneficial to holdings due to its relations to the market and the environment. It does not in any way depreciate the role of the market on the microeconomic scale on the grounds of a need to force through specific state interventions. However, various forms of sustainable agriculture might arise, as a consequence of the combination of its production-related function with the multifunctionality of holdings, their familial nature, ecological production favouring rural development, improvement in food quality or symbiosis with the natural environment.

Questioning the presently applied formula of progress in agriculture is a key precondition for formulating a new, sustainable paradigm for its development (Krasowicz 2009; Fiedor, Kociszewski 2010; Brouwer 2004). This view was expressed explicitly in a 2002 paper, now considered fundamental, titled "Socially Sustainable Agriculture" (Woś, Zegar 2002). The conditions for promoting this new agricultural development model are social awareness of the global ecosystem's limited character (in reference to such elements as water, climate change, and waste) (Zegar 2012), and the recognition that not only market goods, but also extra-market, non-commercial (public) goods such as environmental welfare, the harmony of nature and agricultural production, and the vitality of rural areas are of great importance for the development of agriculture (Altieri 1995; Uphoff 2002; Gliessman, Rosemeyer 2010). It should be noted that the recognition of the need for these public goods (Samuelson 1954, 1955) means that the modernity of technologies cannot be measured only in terms of economic (market) categories, but also in terms of the degree to which production complies with environmental requirements (Kośmicki 2009a). Such a model is more complex than the industrial one, as it requires greater knowledge and social commitment; however, it can provide a guarantee of a healthy, better-quality production, and of food (Malkina-Pykh, Pykh 2003) the demand of which is well-balanced with supply and which is available at a relatively low price. In this case, the problem of the valuation of non-market goods acquires crucial significance.

Conclusions

The paradigm of sustainable agriculture, closely linked to the new agrarian economy, concerns not only the rules of economic balance, but also the goal, scope and methodology of research. In the industrial development model, the focus was the maximisation of economic surplus for the needs of agricultural holdings. Production factors had their market price, while others were considered free goods. In the new agrarian economy, the integrity of economic, social and environmental goals is observed, whereas the economic balance must provide for a balance of gained profits, lost profits and (both negative and positive) external effects. In sustainable agriculture, this balance exists in not only an economic, but also a social and environmental sense. The need for a new balance appears, but it cannot be created solely by the commercial effects of agriculture. Food quality, carbon sequestration, water and soil protection, and biodiversity are among the other elements that are of considerable significance. It is also necessary to accept J.S. Zegar's view that, until economic advantages are addressed to specific parties, the disadvantages will be borne above all by taxpayers, the world of nature and future generations (Zegar 2012).

In considering the determinants of the sustainable agricultural development paradigm, the first thing that comes to mind is the need to draw up a balance of external costs and take a new look at sources of land rent. Without this, the balance reflecting the competitiveness of agricultural production will be made at the expense of natural capital. Secondly, the scale on which the environment is used must be related to a legal standard determined by the state in the form of administrative decisions concerning standards of quality, fees, penalties or subsidies. Some instruments serving the internalisation of costs can be included in the price balance, while others remain neutral with respect to prices. Thirdly, a condition for popularising the sustainable agriculture paradigm is the institutional (national) factor, which determines the division between private and social rationality, both in the economic balance and in the balance of public goods. The essence of the problem is how to support a market mechanism institutionally, since it is the activity of specific institutions that should lead to the consistency of microeconomic and social criteria in the process of decision-making by economic entities. It is assumed, therefore, that an efficient state will secure common goods better than a market driven by consumer needs. On the other hand, the state's weakening capacity as a result of failure to adjust the institutional factor does not favour the sustainable agriculture model. Changing the paradigm of agricultural development from an industrial to a sustainable one will be neither easy nor quick. It needs to be borne in mind that the agrarian economy treats agriculture not only as a business, but also as a way of life, which means that time

is required. Economic theory should evolve towards an economy of sustainability. The process has already commenced, yet it brings about a number of dilemmas. It is obvious, however, that agriculture must satisfy the demand for food products while lowering the pressure on the environment, providing for technological and biological progress, meeting the need to ensure a secure supply of food, and ensuring global economic, social and environmental rationality.

1.2. From the land rent of the physiocrats to political rent in sustainable agriculture

(Bazyli Czyżewski⁶, Jan Polcyn⁷)

Land rent as a prototype of economic rents⁸

Since the early days of economics, economic rents have been linked to the land factor. D. Ricardo developed a theory of differential rents relating to the fertility of land; the theory of absolute rent emphasised the monopoly of ownership rights to land; marginal economics addressed the issue of location rents; and in neoclassical economics rents were ascribed exclusively to the inelasticity of the supply of land. Something that economic rents and the land factor certainly have in common is that both fail to fit the neoclassical models of equilibrium. Economics textbooks list three production factors – capital, labour and land – but many economists would immediately add that the third of these, land, is a constant. M. Blaug states that “modern economics has abandoned the notion that there is any need for a special theory of ground rent. In long-run stationary equilibrium, the total product is resolvable into wages and interest as payments to labour and capital – there is no third factor of production...” (Blaug 1997). If so, then the resources and inputs of agricultural land should be subject to the optimising mechanisms of the market – but why, then, is agriculture such a problematic sector of the economy?

Economic rent is the excess income which provides incentive for a production factor to provide services. It arises in a situation of persistent scarcity of resources, or the impossibility of a resource being valued by the market and taken into account *ex ante* in the economic calculation. If a resource is valued by the market, and its relative supply can be increased, then the economic rent vanishes and becomes a cost. In the case of land rent the rewarded factor is agricultural land the supply of which is limited, even though its production capacity can be increased thanks to technical progress.

Since the 18th century there has been no agreement among economists as to the sources of land rent. Simplifying to a large degree, the problem can be reduced to the question of whether the substance of rent is created by the productivity of the land, or by a subjective perception of the exchange value of that resource, which results

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⁸ Use has been made of parts of Czyżewski (2013) in English translation.

exclusively from the scarcity of the land factor. Regardless of the answer to this question, land rent is taking on an ever greater importance in agricultural economics, because it conditions the processes of extended reproduction in agriculture and the restructuring of that sector. According to many authors, the contemporary agrarian question can be reduced to the problem of the realisation of land rent in agriculture (Czyżewski 2005). This importance is underlined by the strong upward trend in prices of agricultural land in the countries of Central and Eastern Europe.

In market conditions the reduction of the land rent to zero, or any long-term downward trend, would appear to be impossible, because growing demand for land in the long term will, in the author's view, ensure the absolute scarcity of that resource. Land ownership fulfils too many non-production functions, historically rooted in people's mentality – it is a determinant of the territorial sovereignty of nations, a measure of social status, the most durable form of accumulated property. Expectations of an upward trend in land prices in the long term can therefore be considered rational. Land fulfils the three economic conditions ensuring growth in the price of a resource in the long term – it is useful, it is scarce, and there are no substitutes for it. Land rent, in view of its permanence, may become a fundamental source of comparative advantages of the agricultural sector, which might be protected from the process of economic globalisation.

The contemporary importance of the category of land rent is not reflected in academic work on the subject. The theory of land rent developed rapidly in the 18th and 19th centuries, with key chapters of scholarly works being devoted to it – this even made it possible to talk about the question of land rent, being a fundamental source of economic surplus, for example with reference to F. Quesnay's theory of pure product. The scarcity of the land factor attracted the attention of economists in the early 18th century, particularly among the physiocrats, who considered land rent to be the only type of pure product created by farmers and realised by landowners in the form of leasing payments from tenants. The physiocrats' theory includes the assumption of zero accumulation by the "sterile class", in which average profits were reduced through competition to zero, and rents did not occur. The physiocrats, however, merely stated the fact of the existence of land rent in agriculture, without attempting to explain its source. Moreover, the concept of the *produit net* of agriculture as the sole source of income was not treated seriously by classical economists. For example, Adam Smith wrote: "That system which represents the produce of land as the sole source of the revenue and wealth of every country has, so far as I know, never been adopted by any nation (...) It would not, surely, be worthwhile to examine at great length the errors of a system which never has done, and probably never will do, any harm in any part of the world." (Smith 1954). Similarly, until the 1970s, that is, until the award of a Nobel prize (in 1973) to W. Leontieff, the "economic table"

of F. Quesnay was neglected. A. Gray wrote that it was in its time the crowning achievement of Quesnay and the school of physiocrats, “now perhaps better reduced to an embarrassed footnote (...) it may be doubted whether it will ever be anything but a vast mystification” (Gray 1948).

Contemporarily, as we know, the table of intersectoral (input-output) flows is a foundation stone of well-known and useful models of prediction (Galbraith 2011). In a certain sense, history has come full circle. Bearing in mind the great importance that developed countries currently attach to agriculture, it can be seen that mainstream economics has been guilty (not for the last time) of the sin of immodesty in the face of the unknown.

The physiocrats, however, did not attempt to analyse the situation in which the agricultural producer is also the landowner and does not realise a rent. Who then takes over the rent, and what are the economic consequences of this for agriculture and for the economy as a whole? These are among the key dilemmas encountered by the theory of land rents, and it must be noted that today they are taking on an ever greater significance.

In the 20th century, however, all that happened was a review of the phenomenon of the occurrence of land rent, according to either the neoclassical or Marxist theory. Keynesian economics disregarded the problem entirely, accepting the existing theories wholesale. In his *General Theory of Employment, Interest and Money*, Keynes referred only to a “quasi-rent” as a reward for the postponement of consumption (Keynes 2003).

The institutionalism of the 1930s did not make any attempt to modify the existing theories, and broad mainstream economics emphasised the marginalist or neoclassical concepts. Economists who addressed the agrarian question – K. Kautsky and E. Bernstein in the early 20th century, T.W. Schultz in the 1950s, and M. Mieszczankowski, J. Lewandowski, H. Chołaj and M. Pohorille in Poland in the 1960s – considered the problem of land rent very widely, but within the Marxist paradigm⁹ (see also Lewandowski 1960, Mieszczankowski 1964). Similarly, in New Classical Economics and the neo-Keynesian theory no separate analyses are made of rents of the land factor. At present, economics textbooks generally present the Pareto concept of land rent (reformulated by P.A. Samuelson) or else omit the question entirely. A characteristic view is the one of M. Blaug, cited above, that there is absolutely no need for a special theory of land rent (Blaug 1997).

Such a vision of the functioning of the economy is based on a fully predetermined model, in which it is stated from the outset how market players adjust their decisions

⁹ An exception is the work of T.W. Schultz, who showed, with reference to the American economy, that the importance of land rent as an element of inputs would rise despite the process of industrialisation of agricultural production (Schultz 1953).

and how the resulting allocation of resources changes over time. In this model no account is taken of individual creativity, structural changes, the evolution of needs, and especially the possibility of reversing the hierarchy of values on which choices are based. R. Frydman and M.D. Goldberg point out that a fully predetermined model forces the researcher to adopt qualitative limitations at the starting point of the analysis, such as an assumption of diminishing marginal utility. Based on these qualitative limitations, however, precise quantitative forecasts are produced, and the model theoretically retains its properties at different points on the time line. This creates a “semblance of precise knowledge”, and the imprecision and uncertainty is reduced in the model to the probabilistic form of a random component, which is an excessive simplification of these phenomena (Frydman, Goldberg 2009). In the light of this, the cited assertion that the product of the land in the long term melts away into pay and interest represents the reistic assumption that human labour (including capital as its objectified form) is capable of satisfying all human needs, given sufficient time.

The issue of land rent was again overlooked in the discussion on the economic role of the state, which took place in the mainstream of economics following the departure from the Keynesian doctrine in the 1970s. Like the earlier belief in the “tuning” of the economy using instruments of fiscal and monetary policy (see also Heilbroner, Thurow 1981), similarly the mainstream negation of the active role of the state was total in nature, in the sense that it applied to all production factors, including land. No consideration was given to the case of specific external effects and public goods produced in agriculture, which would have justified the application of discretionary national policy with respect to that sector (Wojtyna 1988).

In consequence, in the history of economic thought one can identify four alternative concepts of land rent: the Ricardian differential rents, the “Marxist” absolute rents (referring to Adam Smith), the residual rents of H. George (viewed as marginal rent of scarcity), and the neoclassical rents of inelastic supply of land (Czyżewski B. 2010). Perhaps up to the time of Agenda 2000, which sanctioned the need for changes in the industrial model of agriculture in the European Union, the above theories were sufficient. It is the author’s view that in the current era of transformations in the model of agriculture in developed countries there is a need for a new concept of land rent, which can be constructed based on the methodology of contemporary institutional economics. The neoclassical theory of rent generally presented in the subject literature is insufficient to describe reality, because it reduces the sources of land rent to the inelasticity of supply of land and treats it as a constant in economic models.

How did land rent become a political rent?

Land rent took a permanent place in the annals of political economy through the agrarian question and the resulting need for the retransfer of income to agriculture. To quote J. Wilkin, “(...) the agrarian question can be most simply and most briefly defined as the problem of the lack of adjustment of agriculture, in terms of its structure and mechanism of functioning, to the situation existing externally” (Wilkin 1986). The main symptom of the agrarian question is the disparity in the incomes of the agricultural population, linked to the low productivity of the factors of production, particularly labour, and the insufficient elasticity of productive structures in terms of adjustment to changing market conditions. In the induced development model, Y. Hayami and V. Ruttan nonetheless attempted to show that such adjustments take place as a result of dynamic interactions between agriculture and related sectors, triggered by innovations which upset equilibrium prices. As a result of technological development, there are changes in real prices which “induce” the adjustment of productive structures in agriculture, because agricultural producers are guided by rational criteria (Hayami, Ruttan 1985). In this way, according to J. Wilkin, agriculture theoretically has the ability to participate in both “the feeding of sources of economic development, and the division of the benefits” (Wilkin 1986), but this does not happen if imperfections of the market (such as price flexibility) deform market signals.

The scale of market imperfection is closely linked to a country’s level of economic development. Partly because of this, in the early stages of economic development agriculture co-finances the development of the national economy as a whole, in the sense that a significant part of the added value produced in that sector flows out to non-agricultural sectors. At more advanced stages, at first an equalisation of the streams flowing out of and into agriculture occurs, and later it becomes a net beneficiary, taking over part of what has been accumulated from non-agricultural sectors. “Only in such conditions is there a possibility of growth in the competitiveness of native food producers in foreign markets and the obtaining of benefits from the liberalisation of trade in agricultural products. However, reversal of the aforementioned sequence may be a source of serious social conflicts, because an unprepared agricultural sector comes up against structural and investment barriers that it is not able to overcome” (Woś 2003).

In Poland, the agrarian question visibly arose in the first decade of the systemic transformation after 1990. In the 1990s there was a widening of the disparity between agriculture and other sectors. This was reflected in a declining relationship between the surplus and disposable incomes of individual farms, and the surplus and incomes of entities outside agriculture. At the same time there was a decrease in the ratio of

disposable incomes in agriculture to the added value generated. According to Woś, these processes represented “the flow of agriculture’s added value to non-agricultural sectors”, which is the fundamental ground for agricultural interventionism (Woś 2003). The thesis of “surplus drainage” from agriculture is commonly put forward in the countries of Central and Eastern Europe. For example, A. Czyżewski and A. Matuszczak conclude that “in countries with stable and sustainable economic growth, it has long been noticed that it is necessary to retransfer to farmers that are part of the surplus which flows out of agriculture (...)” (Czyżewski, Matuszczak 2005). Elsewhere, A. Czyżewski explains that “the depreciation of agriculture in intersectoral flows is evidenced by the fact that realised production is smaller than output” (Czyżewski 2007).

An undoubted weakness of such claims of “surplus drainage” is that they can be verified only on the basis of input-based theories of value (such as those based on labour). How is it possible to define the “part of the surplus which flows out of agriculture”, the difference between “realised production” and actual output, or even the actual disposable income of a farm (after payment of all production factors)¹⁰? Data concerning the current surplus of the agricultural sector are available, and are objective. Nonetheless, it is hard to state definitively what part of this surplus has already flowed out; in other words, what would the surplus be if agriculture were not depreciated by the market? At most one can attempt to value the inputs provided (paid for in agriculture out of the surplus), namely own labour and the costs incurred “for the land”, and then compare their value with the realised surplus. Such an approach has two defects: firstly, in a market economy the output is generally not the sum of the inputs; and secondly, the land factor is deprived of its “subjectivity” when its value is defined on the basis of labour and capital inputs. This is analogous to the thesis, known from the history of economic thought, that “capital is objectified labour” – but even less realistic. It should be noted that input-based methods of valuing land rent were criticised in Poland even in the 1960s, although the basis for that criticism was not related to the labour-based theory of value (Chołaj 1966, Czyżewski, Grzelak 2012).

Is it possible, then, to prove the claim of “surplus drainage” in a more objective manner, and consequently to provide justification for the necessity and scale of budgetary retransfers to agriculture? There is a significant gap in economic theory here, because despite the symptoms of depreciation of agriculture relative to other sectors, difficulties arise in precisely defining and quantifying that mechanism. There is therefore a lack of an adequate theory of land rent, which as we can see,

¹⁰ The problem arises here of the valuation of own labour and land rent, which in individual agriculture are paid out of the surplus.

has no wish to “melt away into pay and interest”. The excessive simplification contained in this reasoning results from the fact that the utilities supplied by land do not necessarily come from labour. If that were so, M. Blaug would be entirely right, and the reference point for an “optimum” level of surplus in agriculture would be the average productivity of labour in the economy. The key to solving this problem is therefore assigning to the land factor its own “subjectivity”, namely the ability to create certain utilities by itself without the involvement of labour or capital. In this way, it would be shown how land is genuinely distinct from the other productive factors.

The paradigm of sustainable development is helpful here, which in fact accepts such an approach. Sustainable development is a concept of order integrated in the environmental, social, economic, spatial and ethical planes, which assumes the maximisation of benefits from economic development subject to ensuring the durability and protecting the utility of natural resources in the long term (Woś 1998; Fiedor, Jończy 2009). This concept identifies natural resources as an independent production factor, which is subject to different criteria of effective allocation than labour and capital, at the very least because it does not produce private utilities, only public and common ones. These are inseparably connected with the land factor, which at the same time constitutes a potential resource for agricultural production. In the existing model of agriculture in developed countries (the post-industrial model), agricultural production and the creation of environmental utilities represent competing functions of land. From the point of view of sustainable development, over time those functions should become complementary, which requires the development of new theoretical frameworks for the economics of the land factor, and in particular a new theory of land rent. This theory should explain the relationships between the agrarian question, including the phenomenon of rent drainage, and the new integrated functions of the land factor in the context of the sustainable development paradigm. Existing theories of land rent value the rent in a manner that is not adequate to the contemporary utilities of land, and as a result do not enable an objective estimation of rent “drainage”.

Efficiency-based and monopolistic motives for rent seeking

Rent seeking, according to some authors, means the loss of resources in a process of attempting to gain a monopolistic rent. Some economists believe that it is chiefly in this way that rents affect the allocation of resources (see also Sztaba 2002) and stimulate processes of vertical integration, the goal of which is the occupation of a dominant market position. The motives for rent seeking are therefore of a monopolistic nature (Raczyński 1998).

The scale of the phenomenon of economic rent seeking might therefore be quantified by estimating the size of the consumer's rent that is taken over by monopolists in a given industry. Another method used is calculating the losses in the whole of the economy caused by the existence of monopolies. In both methods, however, it is assumed that rent seeking is a negative phenomenon, being associated with political lobbying or even corruption (Sztaba 1998). Institutional economics nonetheless challenges that view, drawing attention to what can be called efficiency-based motives for rent seeking. The driving force behind seeking rent may be striving to optimise transaction costs.

In the 1950s, A.C. Harberger calculated that the social costs of monopolies are in fact insignificant, amounting to less than 0.1% of GDP (Harberger 1954). This also provides support for the claim that motives for vertical integration are not only monopolistic in nature, but can also be related to efficiency.

E. Katz and J. Rosenberg showed that the higher a country's level of development expressed in GDP per capita, the lower the degree of active rent seeking (Katz, Rosenberg 1989). On the other hand, in the Anglo-Saxon models of the market economy (Albert 1994), there is a dynamic rise in transaction costs and society incurs the costs of disintegration. Citizens are required to participate more and more in activities which increase the domestic product, but not necessarily well-being. Although transaction costs of growth are unavoidable, they do not serve well-being. Some of the growth consequently has the nature of an idle gear. In such conditions, rent seeking becomes an inevitable mechanism of defence against various forms of exclusion in a polarised society (Sztaba 1998).

If rent seeking involves increasing outlays on the "internal" organisation of transactions, but this action has the goal of optimising transaction costs, then social losses do not occur, or else are compensated for by the increase in the producer's rent and the exchange value of goods. It is also argued that sectors with a high degree of consolidation feel a much smaller need for state intervention. This is because they are able to generate economic rents by using their market potential. A parallel process, however, is the intensification of lobbying, directly proportionally to the degree of consolidation of the sector.

Modern institutional economics sets itself the goal of integrating the neoclassical theory with an analysis of the way "in which institutions modify the set of choices available to individuals" (North 1986). In this way methodological individualism, which ascribes the feature of potential rationality to individuals, combines with structural determinism (path dependency), which acquires significance in systems with a large degree of uncertainty, in which market failures accumulate. Theoretically such failures always occur when the market cannot distribute every unit of a shared resource in such a way that the benefit resulting from its switch to another use is

exactly equal to the loss related to its withdrawal from the alternative use. According to institutional economics, transaction costs are among the key types of market failure, and their size reflects the level of the market's inefficiency.

There is no doubt that the level of market failure and imperfection in agriculture is high. Non-optimal allocation in the food economy is caused by the natural rigidity of demand for food, the inelastic supply of raw agricultural products, and the low mobility of assets in agriculture. This means, among other things, that agriculture in Poland is characterised by overpopulation and irrational use of agricultural production space. At present around 17% of the working population is connected to agriculture (compared with just 5% in the "old" member states of the EU-15). Opportunities for the development of Polish agriculture must be sought in improving labour efficiency and the quality of agricultural products, which is forced by the cross-compliance principle realised under the CAP (Leopold 2002). The goal of structural changes in Polish agriculture is therefore to increase labour efficiency or reduce labour intensity, to initiate a process of extended reproduction, to bring about the accumulation of land rent, and to increase the rural population's contribution to the country's economic development. This growth should result to a large extent from the diversification of the sources of agricultural incomes. It should be noted that in the "old" EU-15 member states agriculture accounts for about 5% of the total working population, who produce about 2.0% of GDP. In Poland agriculture accounts for around 17% of the working population, but also currently produces about 2.0% of GDP, counting the added value of agriculture excluding CAP subsidies, or approximately 4% including subsidies.

An effect of the market failure in the agricultural sector is the need for the state to operate a large-scale policy of agrarian interventionism (although there are some economists who would say that this is not an effect, but the cause). It is shown, however, that the retransfer of incomes to the agricultural sector is justified to a large extent by objective economic arguments resulting from the theory of optimisation of transaction costs (see also Czyżewski 2005). A higher degree of contractual integration (vertical and horizontal) of productive structures in the Polish food industry, for example in pig and dairy production, increases the added value realised on individual farms and initiates processes of high-capital intensification of production. This phenomenon, however, could take place on a wider scale. These processes are theoretically stimulated by flows of capital from agriculture-related sectors to farms, made possible by savings of transaction costs in the processing sector and by the increased share of agricultural producers in the processing margin. This is therefore a complementary mechanism to the budgetary retransfer of profits to agriculture, and may ameliorate the problem of rent seeking as agribusiness develops.

To sum up, the motives for rent seeking and related actions in the food industry may be efficiency-related, serving to produce savings of transaction costs. From a theoretical standpoint, the mechanism operates as follows: an economic rent occurs if average productivity is higher than marginal productivity. In the market for final goods the average takings are higher than the marginal value, and the sale price is higher than the equilibrium price. Classically, this phenomenon is explained by a monopoly rent. However, if it is assumed that the lower marginal cost results from the optimisation of transaction costs (and an increase in efficiency), the producer realises a rent. Transaction costs are not, by assumption, subject to market valuation. In terms of factors of production, if the average product of labour is greater than the marginal product of labour (equal to the unit price of inputs), then either we are dealing with the rent of a monopsony, or we explain the phenomenon by a fall in transaction costs.

The above considerations also imply that, regardless of the motivations, rent seeking does take place in the food industry. The accumulation of market imperfections in agriculture means that this involves the seeking of land rent. The market environment, in view of the rigidity of demand and supply in the agricultural sector, takes over the effects of the growth in the real productivity of agriculture, thus realising economic rents. Perhaps these compensate for higher transaction costs which are not subject to market valuation – this is another matter. It may also be disputed to what degree rent seeking is stimulated by inappropriate national regulations rather than market inefficiencies. It is nonetheless a fact that the process of the creation and division of economic rents in the food industry is determined by the land rent. Other rents in the system of the food industry outside agriculture undoubtedly also occur, but they are short-term in nature. Only land rent is a timeless phenomenon. For this reason the process of its creation and division deserves to be given particular attention.

Rent seeking and the paradigm of sustainable development

In the previous section, doubt was cast on the monopolistic motives for rent seeking in the food industry. Apart from these, an important role is also played by efficiency-related motives, which lead to contractual integration for the purpose of achieving savings of transaction costs. The problem of transaction costs takes on particular importance when we recognise that agricultural land provides not only raw agricultural products, but also public goods (Klimowicz, Bokajała 2012). The concept of public goods here is generalised to some extent. In economic theory four types of goods are distinguished: private, common, club and public. The classification is made based on four features: “rivalrousness”, “non-rivalrousness”,

“excludability” and “non-excludability”. In a narrow sense, public goods are those which are non-rivalrous and non-excludable (Ulbrich 2003). For our purposes, however, it is necessary to broaden this definition, above all to include:

- rivalrous goods, because an increase in the consumption of utilities of the well-being of the natural environment may negatively affect its remaining utility;
- merit goods, related to the multifunctional nature of agriculture¹¹.

In some cases the utilities provided by the land factor may also have the status of club goods¹². Hence we take public goods also to include common goods related to the agricultural land factor, merit goods related to the multifunctionality of agriculture, and in certain cases also club goods¹³.

The well-being of the natural environment and rural areas can be regarded as common property, namely such that is not assigned to specific parties and thus cannot be transferred. Environmental resources are therefore exploited on a “first come first served” basis, and the related costs and benefits are hard to value objectively and assign to specific users. Any attempt to value them gives rise to high transaction costs, but failure to do so also generates transaction costs *ex post*, related to, for example, the repair of the effects of inappropriate exploitation of resources or the budgetary redistribution of the rents of the land factor which agriculture has “lost” to other sectors.

It is a matter of debate what in fact creates the new utilities of the well-being of the natural environment. Is it land “intrinsicly”, or are capital and labour also involved? The authors propose the thesis that there are intrinsic utilities of the agricultural land factor. The aim of our further deliberations will be to justify this claim.

¹¹ Merit goods are those that have a social utility that is greater than their individual utility. J. Wilkin points out a number of non-commercial functions of agriculture: “green” functions – management of land resources for the maintenance of its valuable properties, creation of conditions for wild animals and plants, protection of the welfare of animals, maintenance of biodiversity and improvement of the circulation of chemical substances in systems of agricultural production; “blue functions” – management of water resources, improvement of water quality, flood prevention, production of hydrothermal and wind energy; “yellow” functions – maintenance of the coherence and vitality of rural areas, maintenance and enrichment of the cultural tradition and identity of the countryside and regions, development of agrotourism and hunting; and “white” functions – assurance of food security and food safety (Wilkin 2010).

¹² They then have the features “non-rivalrous” and “excludable”. This applies to all types of concessions and permits to use specified utilities of the well-being of the natural environment – for example, for the operation of distilleries, drilling for mineral water, tree felling, economic activity in national parks, hunting, angling, etc.

¹³ Public goods in the narrow sense will be called “pure public goods”.

To begin with, however, it should be considered whether the concept of sustainable development deserves the status of a “paradigm”, and what place agriculture takes in it. The concept of sustainable development has been described as a new paradigm by many authors (Borys 2009, Morozova 2009). This view is also well established in studies by international institutions, in particular in the 1987 report of the World Commission on Environment and Development – the Brundtland Report – and in the EU Sustainable Development Strategy adopted by the European Council in 2001.

Sustainable development is defined more broadly than simply in terms of the precedence of ecological over economic requirements (Borys 1998), creating concepts of an integrated order over the environmental, social, economic, spatial and ethical planes. Quoting B. Fiedor and R. Jończy, sustainable development “involves a maximisation of the net benefits from economic development, at the same time protecting and ensuring the reproduction of the utility and quality of natural resources in the long term. Economic development must then mean not only growth in per capita income, but also improvement of other elements of social well-being. It must also include necessary structural changes in the economy and in the whole of society” (Fiedor, Jończy 2009, Pearce, Turner 1990). This definition alludes to the original idea contained in the aforementioned Brundtland Report, to satisfy the aspirations and needs of today’s generations without limiting the possibilities of satisfaction of the needs of future generations¹⁴.

It is clear how the foregoing definitions can be applied in agricultural economics, on the assumption that the utility and quality of all natural resources is inseparably linked to the land factor, which at the same time constitutes the principal resource in agricultural production. Adding to this the fact that most of the world’s population lives in rural areas, it might be concluded that problems of social and economic balance are also concentrated in the agricultural sector. It is easy to show that the problems of an integrated order are particularly linked to that sector. Agriculture has an impact on most ecosystems and to a large extent determines the quality of natural resources, but also the “quality” of human capital, because it supplies products the consumption of which is forced – namely foodstuffs, in a broad sense. The agricultural sector is also a key element of the social (including political) and economic order.

Social order is defined by, among others, such factors as rural culture and tradition – elements of the well-being of the countryside, the rural population’s access to infrastructure and services, waves of rural-urban migration, diffusion of knowledge and technical progress in rural areas, and the participation of the agricultural sector

¹⁴ In that report sustainable development is defined as a “path of human progress which meets the needs and aspirations of the present generation without compromising the ability of future generations to meet their own needs” (Estes 1993).

in national economic development, which is the greater the less highly developed a country is. From a global perspective, however, it is agrarian interventionism that has been and continues to be a bone of contention in the forum of the WTO. Representatives of less developed and developing countries take the position that the developed countries' subsidisation of agricultural production and protectionism in markets for raw agricultural produce block their development and processes of convergence with the developed countries. It also upsets the environmental order in developing countries, because they are forced to rapidly increase the efficiency of agricultural production at the cost of natural resources.

As regards the creation of an economic order, agriculture can again be distinguished from other sectors, because on the one hand it is a strategic sector, while on the other it does not have functional self-regulating market mechanisms. Developed countries, despite an extensive range of instruments of agricultural policy, remain unable to solve the problem of disparity between agricultural incomes and those of other sectors.

In the light of all this, the paradigm of sustainable agriculture is fundamentally an elaboration of the paradigm of sustainable development. This is confirmed by selected definitions of the integrated orders – economic, social, and environmental – as used in agricultural economics (see Table 1.1.). Long-term forecasts tell us that agriculture of the 21st century will be increasingly environmentally sustainable; it will nonetheless remain unbalanced in economic terms, as this results from processes which by nature involve the continuous destruction of the achieved balance and the attainment of a new one, on a new and higher level. Nonetheless, these processes will be subjected to ever stricter environmental requirements. The social aspect will thus be “torn between globalism and locality” (Zegar 2007).

From the paradigm of sustainable agriculture comes the following message: natural and social capital (including public goods) can only to a limited degree be replaced by human-made capital, and the degradation of natural and social capital cannot be compensated for by the benefits provided by human-made capital (Jeżowski 2009).

In reference to this thesis it may be noted that in the conditions of the new paradigm, the land should create certain utilities “intrinsicly”, that is, without the participation of capital. Land cannot therefore be treated in accordance with the mainstream economic doctrine as just another type of fixed asset, with neoclassical microeconomic concepts applied to the optimisation of its inputs. The foregoing also implies that the productivity of natural resources cannot in all conditions be increased by means of the substitution of capital.

Table 1.1. Definitions of sustainability of the economic, environmental and social orders under the paradigm of sustainable agriculture

Author	Economic (productive) order	Social order	Environmental/ecological order
M. Adamowicz	Production in sufficient quantities with acceptable quality and good efficiency.	Provision of satisfactory conditions for the population living in the agricultural and rural environment, both in terms of level of incomes and in terms of social status and place in contemporary societies.	Absence of pollution, but above all the valuing of natural resources.
A. Harasim	Creation of <i>agricultural income</i> ensuring a decent quality of life for farmers and their families and enabling <i>farm development</i> . Creation in appropriate quantities of agricultural products with the qualities required by the consumer or the processing industry.	Creation of agricultural income <i>ensuring a decent quality of life</i> for farmers and their families and enabling farm development.	Assurance in the long term of a balanced agrosystem and avoidance of degradation of the natural environment.
L.H.G. Slangen	The economic dimension is the ability of agricultural productive potential to satisfy society's food needs.	The social dimension is linked to a system of institutions (formal and informal) laying down principles that guarantee to the whole of society food security and the protection of nature.	From an ecological perspective it is important that the agricultural sector be able to maintain the resources of the natural environment in good condition.
J. S. Zegar	On a microeconomic scale, the delivery of a satisfactory income, which means that satisfaction occurs when there is parity between agricultural and non-agricultural incomes. On a macroeconomic scale, gross added value and the value of agricultural production, particularly commercial production.	Valuation of environmental services, use of agricultural labour resources, contribution to the maintenance or development of the economic and social vitality of the countryside and of cultural values.	Adherence to a code of good agricultural practices and consideration of legal and administrative criteria in the granting of support from public funds.

Source: Based on Matuszczak (2009)

Similar doubts arise regarding the process of substitution of capital for the labour factor in the context of the problem of hidden unemployment in rural areas and the so-called “storage” functions of agriculture in the period of systemic transformation in Poland. It is hard to speak about a labour-intensive model of agriculture in Poland, because the degree of intensity of organisation of agricultural production, measured for example by Kopeć’s index (Kopeć 1984), is low. Following the first five years of transformation, the population of redundant persons in agriculture was estimated at 916,800, of whom 48% were classified as “totally redundant”, and thus by the

nature of things excluded from processes of substitution (Błąd 2010). This means that capital-intensive progress, in the sense of interdependent processes of growth of the resource of capital and reduction of the resource of labour, is a debatable development scenario for agriculture in Poland and other countries of Central and Eastern Europe that face similar problems.

Capitalisation of the intrinsic utility of land in its market value

From the start of human civilisation, land has created certain utilities satisfying that civilisation's needs. These arise without the participation of other factors of production, constituting an unquestionable gift of nature. In his encyclical *Caritas in Veritate*, Pope Benedict XVI describes it as a “miraculous fruit which human beings may use responsibly so as to satisfy their rightful needs – material and immaterial – with respect for internal balance” (Czyżewski, Matuszczak 2012).

In tribal (natural) economies, where agricultural land in today's sense did not exist, examples of such utilities were forest fruits, hunted animals, and access to water and firewood. The creative role of the land factor in providing these was dominant over the required inputs of labour and capital. It can therefore be stated that the dominant part of the utility of land arose intrinsically. When land came to be cultivated and animals domesticated, the part ascribable to nature decreased slightly in favour of the active role of human beings. Increments in the mass of plants and animals, building materials, and broadly-defined living space were nonetheless still obtained with minimal inputs.

In the feudal system, a kind of legitimisation of the intrinsic utilities of land can be seen in “servitudes”, understood as the right to make use of the natural utilities of land belonging to the feudal lord (in the form of brushwood, fruits, clay, or fish).

As the money-goods economy developed, that part of the utility of the land factor which arose without the participation of capital and labour was transformed into “intrinsic productivity” (in money terms). This is expressed, for example, in the previously mentioned concept of *produit net* proposed in the 18th century by the physiocrats.

Hence, in the peasant economy, the part of the utility ascribed to the exclusive action of forces of nature (land) was relatively large, and was also expressed in a certain part of the cash productivity of the economy (since it created part of the product without inputs). Its importance began to decline in the face of the industrialisation of agriculture and activation of the law of diminishing marginal utility. In industrial agriculture the intrinsic contribution of land to the creation of utilities decreased in favour of capital and hired labour. The intrinsic cash productivity of land also vanished to a significant degree.

With time, however, the productive functions of agricultural land, subordinated to microeconomic optimisation, and the requirement for it to satisfy existential needs, became mutually competitive. This led to the need to seek a new concept of economic development.

To what extent does the assertion of the existence of an “intrinsic utility of land” hold in the context of the paradigm of sustainable development? One of the reasons for the development of this paradigm is the fact that in developed countries the natural environment has become almost completely anthropogenic. In such conditions there must also be a change in the way of using natural resources. This is enforced by new needs and priorities – for example, the desire to ensure the renewability of natural resources. These uncover anew the “utilities” of the land factor which were marginalised in industrial agriculture, assigning them the status of public goods for which the whole of society should pay. This cannot, however, be the same intrinsic utility of agricultural land as in the 18th century, because, at least in developed countries, the natural environment has been changed overwhelmingly by human action. An increasing part of the utility of land is again coming into being intrinsically, but in conditions of far-advanced and irreversible accumulation of capital. It can therefore be said that in sustainable agriculture many new utilities of the land factor are created intrinsically, that is, without additional inputs of capital and labour (but not without them playing any active role whatsoever). Since these have the nature of public goods, they are paid for largely out of taxes (through the CAP in EU countries)¹⁵, and that payment goes to the owners of the land resources which created them. In this way the intrinsic utility of land takes the form of an economic rent, which increases the cash productivity of farms and is discounted by the market for agricultural land and through prices of certain products (e.g. organic products).

For example, the extensification of the cultivation of meadows under agro-environmental programmes makes it possible to reduce capital and labour inputs and to pay an economic rent under the CAP. This rent is sometimes erroneously interpreted as compensation for reduced productivity. It should be noted, however, that even if in terms of value it scarcely compensates for the lost productivity, this occurs in conditions of lower inputs of capital (working capital and depreciation) and labour. Thus, in effect, the cash productivity of the factors of production (understood as the ratio of the cash product to the inputs) increases. This increase can be ascribed to the creative force of nature (land), since a lower intensity of management activates its natural utilities, which are of the nature of public goods. In the cited example of the extensive cultivation of meadows, these utilities will include, for example,

¹⁵ Given an adequate level of social awareness, these utilities can also be paid for through prices of products and services.

increased biodiversity, landscape and recreational values, and a more “ecological” raw material (hay).

Another example is organic farming. In this case capital inputs are reduced with the substitution of labour inputs, this being a condition for obtaining the aforementioned rent from the CAP. Given adequate social awareness, the fall in productivity here may be compensated for by an increase in the prices of organic produce. However, the rent received from the CAP is remuneration for new utilities of land and, as above, increases the cash productivity of the factors of production. Analogous reasoning may be applied to other subsidies given under the CAP. In the author’s view, the CAP programmes represent an attempt to value the intrinsic utilities of land that have the nature of public goods. Rent on this account is received by the owner of the resource or by the user, who passes it on in the form of payments for the lease of land. The user is nonetheless required to enable (or at least not obstruct) the creation of those utilities by the land.

To recap, agricultural land creates some utilities intrinsically, these being subject to institutional valuation (through rents paid under agricultural policy) or valuation by the market (through the prices of products), insofar as the intensity of the agricultural economy is limited to some degree. This, however, is conditioned by a specified level of “original” accumulation of capital, which means that the economy has reached a stage in its evolution where society voices a demand for those utilities.

This “original accumulation” should be understood here in a broad sense. It includes technological progress, advancement of processes of urbanisation, development of infrastructure, standard of living, as well as the attained level of spatial management, agricultural culture and cultivation of land. Referring to the cited example of meadows, one must not forget that it was through many years of cultivation that those meadows (in today’s meaning) came into being, and neglect to prevent the secondary succession of vegetation (encroachment of bushes and trees). In this case the essence of the utility of the land is the meadow ecosystem. This is so unless secondary succession is a conscious choice, having the aim of enabling the land to create other utilities – for example, non-cultivation of land in the buffer zone of a national park.

The driving force here, then, is the demand side. As an effect of its action, a multifunctional model of agriculture is formed, delivering public goods as side effects of agricultural production. These include, according to A. Vatn: environmental factors (landscape, biodiversity, pollution, recreation, cultural heritage, food and nutrition security) and factors relating to rural life such as settlement models and rural culture and tradition (Vatn 2010, Falkowski 2010).

We can therefore conclude that at present, the reason for the existence of land rent are the intrinsic utilities of the land, which in a money-goods economy cause

the expected productivity of capital in agriculture to be higher than in related market sectors. These expectations are largely connected with the political rents received by agriculture, and hence with the phenomenon of rent seeking, but not exclusively. To an increasing degree the market for agrotouristic services and organic produce also values the intrinsic utility of land. The value of land rent is therefore determined by the positive difference between the expected productivity of capital in agriculture and in related market sectors. The market for agricultural land discounts, in prices, the expectations concerning this excess productivity of capital in agriculture.

Evidence of this is provided by the data given in Tables 1.2. and 1.3., relating to land rents discounted in the prices of land and payments for the leasing of land in Poland.

Table 1.2. Annual value (in Polish zloty¹) of payments for the lease of land in Poland (a proxy for the use value of land)

land area (ha)	1999	2000	2001	2002	2003	2004	2005	2006
up to 1.00	90.38	86.23	92.03	77.54	108.85	155.76	97.75	156.14
1.01–9.99	87.94	81.53	75.59	75.91	98.41	129.60	114.12	188.54
10.00–99.99	99.39	115.55	96.73	89.08	126.99	223.56	157.89	211.54
>=100.00	85.98	120.82	111.75	109.16	122.96	256.60	177.75	196.56
300.00 or more	-	-	-	-	-	211.83	210.62	141.59
Average	90.92	101.03	94.02	87.92	114.31	195.47	151.63	178.87
land area (ha)	2007	2008	2009	2010	2011	2012	2013	2014
up to 1.00	282.22	335.24	316.98	299.65	710.67	621.43	641.71	549.59
1.01–9.99	348.84	373.75	250.00	356.23	587.45	643.32	703.59	612.36
10.00–99.99	451.14	445.57	297.78	436.15	651.15	942.92	886.88	944.89
>=100.00 ²	450.77	426.71	207.02	321.68	1064.03	437.53	595.23	1298.57
300.00 or more	425.54	799.19	230.02	521.64	581.00	466.07	500.75	368.73
Average	391.70	476.09	260.36	387.07	718.86	622.25	665.63	754.83

¹Euro (EUR) to Polish zloty (PLN) average exchange rate over 1999–2014: 1EUR=4,06 PLN

²from 2004: 100.00–299.99

Source: Central Statistical Office (GUS) and Agricultural Property Agency (ANR) in Poland (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

Table 1.3. Value of land rent discounted in prices of land (in Polish zloty¹), and the excess part of the value of land rent depending on land area (a proxy for farmland amenities and speculation)

item	1999	2000	2001	2002	2003	2004	2005	2006
Average land rent (zloty)²	418.4	564.3	612.7	371.1	332.5	457.7	430.3	485.9
Land area (ha)	Surplus part of the value of land rent							
up to 1.00	0.78	0.85	0.85	0.79	0.67	0.66	0.77	0.68
1.01–9.99	0.79	0.86	0.88	0.80	0.70	0.72	0.73	0.61
10.00–99.99	0.76	0.80	0.84	0.76	0.62	0.51	0.63	0.56
>=100.00 ³	0.79	0.79	0.82	0.71	0.63	0.44	0.59	0.60
300.00 or more	-	-	-	-	-	0.54	0.51	0.71
Average	0.78	0.82	0.85	0.76	0.66	0.57	0.65	0.63

Table 1.3. cont.

item	2007	2008	2009	2010	2011	2012	2013	2014
Average land rent (zloty)	665.0	934.0	1043.0	1042.5	1192.2	1272.1	1061.5	1137.6
Land area (ha)	Surplus part of the value of land rent							
up to 1.00	0.58	0.64	0.70	0.71	0.40	0.51	0.40	0.52
1.01–9.99	0.48	0.60	0.76	0.66	0.51	0.49	0.34	0.46
10.00–99.99	0.32	0.52	0.71	0.58	0.45	0.26	0.16	0.17
>=100.00	0.32	0.54	0.80	0.69	0.11	0.66	0.44	-0.14
300.00 or more	0.36	0.14	0.78	0.50	0.51	0.63	0.53	0.68
Average	0.41	0.49	0.75	0.63	0.40	0.51	0.37	0.34

¹ Euro (EUR) to Polish zloty (PLN) average exchange rate over 1999-2014: 1EUR=4,06 PLN

² Annual land rent (R) discounted in prices of agricultural land, calculated from a formula discounting the stream of perpetual rents: $R = L * s$, where L is the market price of land (according to the Central Statistical Office, Eurostat code: *apri_ap_aland*), and s is the discount rate, i.e. the long-term interest rate (Eurostat code: *irt_lt_mcby_a*)

³ from 2004: 100.00–299.99

Source: Central Statistical Office (GUS) and Agricultural Property Agency (ANR) in Poland (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

The lease payments are the results of tender procedures for the leasing of land from the national stock administered by the Agricultural Property Agency (ANR), in which the participants are primarily farms. This value therefore reflects the productive utilities of the land and the expected income from them. Table 2 shows the land rent discounted in average prices of agricultural land, assuming that the current value of the land is a discounted stream of perpetual rent. This can be seen to be significantly higher than the lease payment, but it must be noted firstly that the difference is smaller in farms above 100 ha in size, and secondly that it decreases year by year (for example, the average land rent was 4.5 times higher than the average lease payment in 1999, but only 1.5 times higher in 2014). The following conclusions are therefore suggested:

- 1) since the end of the 1990s the market for land has discounted, in rising prices, the process of integration with the EU and the introduction of the SAPS system in Poland from 2004;
- 2) year by year, and in line with the phasing-in of CAP subsidies, land prices reflected the increasing political rents and the related expected increase in farm income, but also the new utilities of land. On large farms land has primarily a use value, hence the excess value of the land rent contained in land prices is smaller. We believe that the process of discounting of political rents has now ended;
- 3) formally, the phasing-in process in the EU-12 countries ended in 2013 (in 2011 in Poland, due to national support). The excess value of land rent discounted in prices is nonetheless still found to be approximately 34–40% of that rent

(cf. Table 2). This shows that prices of agricultural land are still discounting expectations of increasing productivity of capital in agriculture. The question is: from what is that growth expected to result? Is it purely speculation, or is account being taken of non-agricultural utilities (amenities) of land, including environmental ones? This is a complex problem, requiring an analysis of the market for land in different locations and with different uses. This topic will be addressed in later parts of the book.

Conclusions

The statistical data presented here show that land prices in Poland discount a significantly greater quantity of utilities than would result from the agricultural functions of land. A similar situation exists in other EU countries. The question is where the excess value of land comes from. It is undoubtedly created by expectations of political rents and by speculative motives, but also by the non-agricultural utilities of the land. It is nonetheless difficult to determine the proportional contributions of these factors. A new theory of land rent should take account of the fact that in sustainable agriculture many new utilities of the land factor are created intrinsically, that is, without additional inputs of capital and labour. These have the status of public goods, and are paid for chiefly through agricultural policy (that is, through taxes). In this way the intrinsic utility of land takes the form of an economic rent, but we believe that this process may also take place through market channels. In this way history has come full circle, and the pure product of land as described by the physiocrats has been reactivated.

1.3. Interest groups and rent seeking in agriculture – a theoretical approach

(Agnieszka Poczta-Wajda¹⁶)

Introduction

Contemporary agricultural policy in developed countries, and its mechanisms, do not always accord with the theories of classical economics, which neglect the conditions and structures in which the maximisation of profits takes place. Methodological individualism, characteristic of the neo-classical approach, often overlooks the benefits and costs resulting from collective actions (Czyżewski, Kułyk 2013). It is partly for this reason that contemporary agricultural policy is also a focus of interest for political economy and the public choice school. These theories seek to explain the forces influencing the selection and implementation of public policies in a particular governance environment. The policy-making process is a function of bureaucracy and the actions of rent-seeking interest groups, which expend time, energy and money to influence the design and implementation of policies. Once a policy is in place, the process of incidence begins and results in market adjustments and economic consequences (Rausser, Roland 2010). The interlinkage between the economic situation and the policy-making process is presented in Figure 1.1 In this paper we shall review only a part of these complicated policy-economic relations, with reference to the European Union's Common Agricultural Policy.

The high level of economic support received by European farmers seems to result at least partly from the lobbying activity of interest groups, and is a good example of political rent. This paper is intended as strictly descriptive, and its main objective is to review the basic concepts of public choice theory with regard to agricultural policy. Hence it explains the mechanisms of rent-seeking behaviour and its consequences, discusses the ideas behind the interest group theory, which might be useful in analysing lobbying activities in agricultural policy, and looks for some empirical evidence in the contemporary literature.

The structure of the paper is as follows. Section 2 provides definitions of economic and political rent and discusses different aspects of rent-seeking mechanisms. Section 3 explains the relationship between rent-seeking behaviour and collective action. Section 4 presents a simple model for the influence of lobbying on agricultural policy, and includes a short review of empirical literature on rent-seeking activities in the EU agricultural sector. Finally, section 5 sums up the topic and draws some conclusions.

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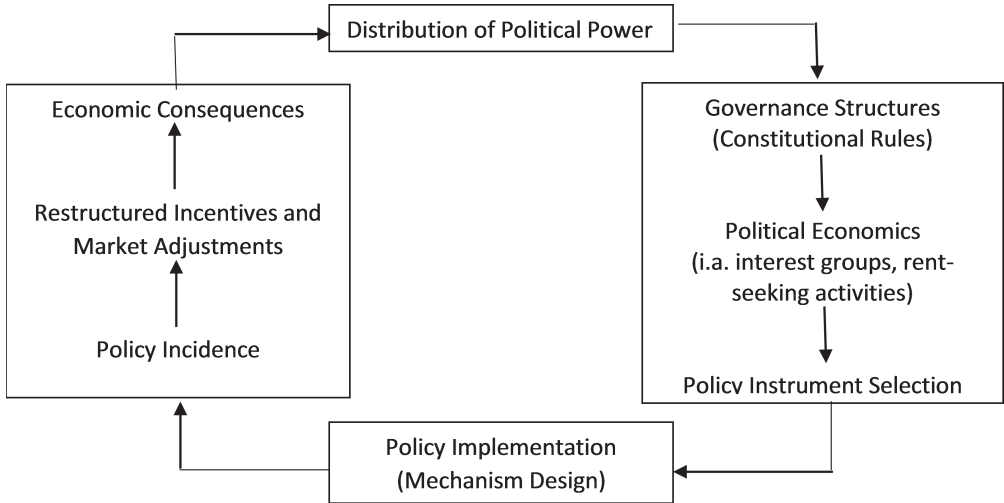


Figure 1.1. The policy-making process and economic consequences

Source: Rausser, Swinnen, Zusman (2011)

Economic versus political rent and rent-seeking activities

The concept of rent was introduced to the literature by D. Ricardo, who referred to the scarcity of land as a factor of production in the face of rising demand for food. This is what is called land rent (Ricardo 1817). The modern concept of rent also encompasses the benefits arising from the possession of other limited resources. It may be understood as the excess above the alternative cost, as the remuneration of a production factor, or as a profit. Rent obtained in a natural way, namely in the market through the competitive (price) mechanism, is called economic rent. This is viewed positively, since it motivates economic entities to make more efficient use of the productive resources that they control (Tollison 1982).

On the other hand, rent obtained in an artificial manner, namely by way of political mechanisms and government decisions, is called political rent. This is a form of benefit resulting from the employment of limited resources in activity that does not increase the quantity of products or services, but only leads to the transfer of income between economic entities (Hindmoor 1999). Sources of political rent may be found, for instance, in customs duties and other trade barriers, subsidies and grants, tax relief and exemptions, monopolies, preferences in the awarding of government contracts, etc. Political rent is usually assessed negatively, since it leads to the unproductive use of resources, thus reducing the level of social well-being (Murphy, Shleifer, Vishny 1993, Czyżewski, Matuszczak 2016). It also results in a distribution of income other than that which would be determined by the market.

Apart from economic effects, the desire to obtain political rent may also produce adverse social symptoms, such as corruption (Elsenhans 1997).

The term *rent seeking* most often refers to attempts to gain political rent, where economic entities strive to exert influence on their economic or legal environment for the purpose of obtaining additional advantages not resulting directly from economic activity. J. Wilkin (2012) defines rent seeking as actions taken by rational entities which believe that the employment of their resources in additional direct productive activity leading to some sum of useful products and services will bring them less benefits than the use of those resources to obtain a rent being the result of a political decision. The term was first used in the literature by A. Krueger (1974), but the phenomenon had previously been described by, among others, one of the leading representatives of the public choice school, G. Tullock (1967). He claimed that the social costs of imposing customs duties are not limited only to the loss of social well-being resulting from the fall in consumption of the protected good and inefficient use of resources for its production, but also include the transaction costs of the customs system and the cost of lobbying that leads to the imposition of such duties¹⁷. The direct social cost of rent seeking corresponds to the alternative cost of using the resources allocated for that purpose in other productive activity (Tullock 1980a). In turn, based on research in India and Turkey, A. Krueger found that firms compete among themselves for the rents obtained by way of political decisions. These rents result from limitations in the free operation of the market mechanism, in the form of trade policy instruments (e.g. customs duties, import quotas, export subsidies) and instruments of internal support for specified social groups (such as the subsidisation of credit). The third fundamental work on rent seeking is that of Posner (1975), who presented the first model of rent seeking using the example of lobbying for a fixed price.

Rent seeking may be done by legal methods (such as lobbying or the financing of election campaigns) or illegally (as in the case of corruption). In the first case, interest groups use their resources to finance the activities of lobbyists (lawyers, economists, experts) so as to push through measures that are favourable to them. The institution of legal lobbying is characteristic of developed countries. Rent seeking is expected to occur primarily in situations where the advantages resulting from government regulations will go to a relatively small group of beneficiaries, while the costs will be divided among a large group, for example taxpayers. Opportunities to gain political rent will be the greater, the better organised the rent-seeking group is. A good example of this phenomenon is the activity of agricultural organisations

¹⁷ In the same paper, Tullock also pointed out the social losses resulting from monopolies and from theft.

(such as COPA-COGECA in the EU) that have been able to achieve high levels of financial transfers to agricultural producers, which in developed countries account for only a few percent of the workforce. Rent seeking may also take the form of social campaigns, exerting influence on public opinion. An opportunity to obtain additional political rent arises in connection with matters of technical regulations, health standards and other measures the evaluation of which requires relevant knowledge. Even scientists are often unable to evaluate an issue unambiguously, which creates room for action by interest groups and the possibility of manipulating public opinion (Lamb 2006). An example of such behaviour are the attempts by the agricultural lobby in the EU to block the import of genetically modified food and meat from animals that have been given hormones (Skoba 2013). Citing scientific studies (Cooper et al. 2009) the EU agricultural lobby also attempts to convince public opinion of the necessity to continue giving support linked to the supply of public goods by agriculture.

An illegal form of rent seeking, namely corruption¹⁸, occurs primarily in less developed countries. Bribery is regarded as a particularly damaging form of rent seeking, since apart from the socioeconomic costs, it also has consequences for public trust in state institutions and their legitimacy.

Apart from the phenomenon of rent seeking, mention should also be made of the phenomenon of rent protection. Individuals or groups may use real resources to protect their rents from encroachment by other rent seekers. Once an interest group wins a political rent, any reforms or other attempts to remove that rent will encounter difficulties. The beneficiaries of a political rent will be ready to spend at least part of it on resisting reform and protecting their transfers (Tollison, Wagner 1991).

Although political rent seeking is evaluated negatively¹⁹, it is nonetheless a sign of rational behaviour by entities striving to realise their interests and maximise their utility function. The government is a rational economic entity that aims to maximise its utility, which in its case means retaining power for as long as possible. To win votes, the government tries to gain the support of various social groups by offering them assistance in the form of desired regulations, taxes and subsidies. Interest groups

¹⁸ Some authors (Tollison 2012) believe that bribes are not, by definition, a cost of rent seeking. A bribe is a transfer and a method of exerting influence on the government, but it does not involve the expenditure of costly resources to procure a transfer.

¹⁹ It is claimed by some authors (Schmitz et al. 2010, Baylis, Furtan 2003) that in some circumstances political rent seeking can improve social well-being. This results from the fact that interest groups may have better information on social preferences than the government does, and hence decisions influenced by lobbying activity may be more effective. Schmitz (2010) writes that “if an economy has no distortions, rent-seeking activity will result in inefficiencies. However, if distortions do exist, it is possible that rent-seeking activity can improve economic efficiency.”

aim to inform the government of their needs, devoting resources to such activity. Hence there exists a political market in which the government offers political rents to interest groups in exchange for their support (Schmitz et al. 2010). The result of this political game may be the government selecting measures that are not most effective from an economic point of view, but which enable it to gain the greatest number of votes. In an extreme situation, as presented in Table 1.4., politicians may decide against implementing the economically most effective policy (policy A) in favour of the least effective policy (policy D), if the latter is expected to bring them the greatest number of votes.

Table 1.4. Political rent-seeking activity and policy choice

Policy rank with regard to:		Political choice
Economic efficiency	Number of votes	
A	D	D
B	C	C
C	B	B
D	A	A

Source: (Schmitz et al. 2010)

Rent seeking in the interest group theory

Rent seeking is a phenomenon considered by most of the theories originating from the public choice school. It is primarily associated with the theory of interest groups, and is asserted to be the principal cause of the formation of such groups. Action to obtain rent often requires significant expenditure, which can only be covered if interest groups are formed. Tullock stated (Rowley et al. 1988) that governments generally do not impose protective tariffs unless there is an interest group lobbying for them. It may appear that the greatest opportunities for obtaining political rent belong to large interest groups, which have large amounts of resources and represent large numbers of votes. This assumption only holds, however, in conditions of direct democracy. Under representative democracy, it is smaller groups that turn out to be politically more effective (Hillman 2003).

The relationship between the effectiveness of interest groups and their size was first considered by M. Olson, in his well-known book *The Logic of Collective Action: Public Goods and the Theory of Groups* (Olson 1965). This book questions two widespread opinions: that in a democracy the majority will prevail over the minority; and that everyone in a group will act collectively to achieve a common interest. Because its considerations apply to many important real-world situations, the book remains highly relevant even today (Sandler 2015; Congleton 2015). Olson argues that incentives to act collectively decline as the interest group becomes relatively larger, and that smaller interest groups gather more political power. There are several

factors which explain this phenomenon²⁰. Firstly, in order to act collectively, a group requires some kind of organisation, communication and coordination among its members. The transaction costs of organising a lobby are higher in larger groups than in smaller ones. Even when the question of costs is neglected, the effectiveness of communication between members of a large group is smaller and often makes joint undertakings impossible. Secondly, an inextricable element of the theory of interest groups is the phenomenon of “free-riding”. Public policies favouring a given social group do not distinguish between the members of that group on the basis of their spending on rent seeking. Such policies are usually of the nature of public club goods, and hence some entities, acting strategically, will adjust their rent-seeking expenditure to the decisions of other members of the group, thus obtaining the same individual benefit for a relatively low output. In his analysis of interest group behaviours, Olson (1965) pointed out that smaller groups are better able to control free-riding than large ones. In turn, Pincus (1975) claimed that the control of free-riding is favoured by the geographical concentration of a group. Thirdly, the size of the benefits that members of interest groups receive as a result of policy decisions is larger in smaller groups. Potential gains per capita in smaller groups are higher, while individuals in larger groups gain less²¹. This means that incentives to act collectively are weaker in larger groups.

The theory of interest groups is well suited to rent-seeking activity in the agricultural sector and to explaining the effectiveness of farmers’ political lobbying. In terms of politics, the group size theory assumes two groups, one favouring the policy and the other opposing it (Pecorino 2015). The effectiveness of agricultural lobbying relative to activity on behalf of consumers or taxpayers becomes clearer when one analyses in detail the sharing of the social costs and benefits of agricultural policy. Along with economic growth and changes in the structures of the economy, the distribution of the benefits and costs of agricultural policy also changes. Firstly, the proportion of the population working in the agricultural sector becomes relatively smaller, while the antagonistic group, which bears the costs of supporting farmers, namely consumers or taxpayers, grows in size. This means that the per capita cost (i.e. per person employed outside agriculture) of supporting agricultural income becomes smaller, and so does the incentive to act against such a policy (Swinnen 2008). Secondly, because consumers become richer and due to Engel’s law the expenditure on food as a percentage of total consumer spending decreases, public opposition

²⁰ More formal considerations regarding the group size paradox and rent-seeking behaviour in groups can be found in (Cheikbossian 2008; Baik, Lee 2007; Nitzan, Ueda 2009; Kolmar, Rommeswinkel 2013).

²¹ This holds only when the public good for which the group lobbies is rivalrous (Pecorino 2015).

to agricultural subsidies will be reduced as the relative cost of such support per consumer declines. Thirdly, awareness of the rent-extracting situation among the antagonistic group is usually lower (Fischer 2006). Sometimes consumers are not even aware of the cost that they are required to bear.

These three facts lead to a situation in which the benefits of a potential reduction in agricultural support would be distributed among a large group of consumers and taxpayers, which decreases incentives to engage in a policy against agricultural support. For an individual it is simply not beneficial enough to engage resources and time, because the profits would be too small. R. Tollison (2012) argues that “not all suppliers of wealth transfers find it economically rational to allow their wealth to be taken away (why spend a dollar to save a dime?)”.

On the other hand, it is also worthwhile to look more closely at the benefits that agricultural policy generates for the farmers. Firstly, as the level of farmers’ income received from the market drops, they start to look for other sources of income, including government transfers. The result is that the incentives to engage in political and collective actions are stronger. Secondly, because the relative size of the farmers’ interest group is declining, the per capita benefits of agricultural policy are higher and of greater importance for individuals, hence they tend to act actively in favour of their interest group. Being aware of this, the government and political parties support the most influential group – farmers in this case. For this reason, the relatively smaller farmer group might benefit from a higher level of agricultural protection.

Rent-seeking activities under the Common Agricultural Policy – a need for empirical evidence

The European Union’s Common Agricultural Policy is a modern example of the phenomenon of rent seeking²². The state plays an important role in facilitating rent seeking and rent protection in Europe. A large part, sometimes even the majority, of the income obtained by farmers in the EU is a result of political decisions and the financial support received, rather than of productive activity. The level of subsidies and other benefits is decided by the authorities at European level. Though decreasing over time, the various forms of transfers to the agricultural sector and rural areas amount to almost half of the total EU budget. One must also add the losses to

²² This view is disputed by B. Czyżewski and A. Brelik (2014), who claim that subsidies paid to agriculture under the CAP cannot be treated as political rents according to the classical definition. In view of the “drainage of economic rent” from agriculture that results from market failure and the fact that the sector supplies public goods (landscape, biodiversity, rural culture, traditions, etc), only the part of the subsidy remaining after the deduction of sums compensating for market failure and payments for public goods should be considered a rent.

consumers resulting from higher food prices. It can be assumed that these subsidies are partly a consequence of the political activities of interest groups. In order to secure these benefits, farmers continue to engage considerable resources in lobbying efforts. Rent-seeking or rent-protecting behaviours of European farmers also include their engagement in actions to influence public opinion such as demonstrations, dumping agricultural products on the street or blocking traffic with tractors (Mueller 2015).

A model of the influence of lobbying on decisions relating to the Common Agricultural Policy was constructed by Jonnson (2007). He assumed after Gardner (1987) that policy makers face a redistribution problem between consumers and producers when setting agricultural support levels. The agricultural subsidy (s^i) for commodity i benefits both consumers and producers, but the subsidy cost is borne by taxpayers. The government tries to maximise a weighted sum of consumer surplus $C(s^i)$ and agricultural producer rent $P(s^i, X^i)$, where X^i is a vector of commodity- or producer-specific exogenous variables. Hence the government's objective function can be written as:

$$\Omega^i = C(s^i) + \theta^i P(s^i, X^i) \quad (1.1)$$

where θ^i (≥ 1) is the weight attached to the producers of commodity i , determined by how effective their lobbying is. Assuming that there are no cross-commodity linkages, the subsidy cost (s^i) is an implicit budget restriction in the redistribution problem, hence the maximisation of expression (1) with respect to s^i gives:

$$s^i = f(\theta^i, X^i) \quad (1.2)$$

However, if there are cross-commodity linkages, which means that increasing support to one producer group would mean less support to other groups, then the budget constraint can be written as:

$$\tau = \sum_i s^i \quad (1.3)$$

where τ is the exogenous total expenditure for the CAP. Assuming that the overall government objective Ω is the sum of the product specific objectives Ω^i , where $i=1, \dots, n$, then the maximisation problem can be written as:

$$s^i = f(\theta^1, \dots, \theta^n, X^1, \dots, X^n, \tau) \quad (1.4)$$

Therefore the agricultural subsidy size for commodity i will depend on the effectiveness of the lobbying group, the commodity- or producer-specific exogenous characteristics and the overall CAP budget.

Although the theoretical literature on issues of rent seeking and collective actions is vast, there is not much empirical work dealing with political rents under

the EU Common Agricultural Policy²³. One of the most common approaches to measuring the political rents received by European farmers is based on the Producer Support Estimate (PSE), calculated and published annually by the Organisation for Economic Cooperation and Development (OECD). This index shows what part of an agricultural producer's income is the result of various forms of government support²⁴. The data presented in Figure 1.2 suggest that currently about 20% of the income received by European farmers results from public support (OECD 2015). Three or two decades earlier this figure was higher; however, one should not rush to conclude that political rents in European agriculture have been shrinking. The PSE does not take account of many new policy tools addressed to the sector as a whole, or some of the rural development measures.

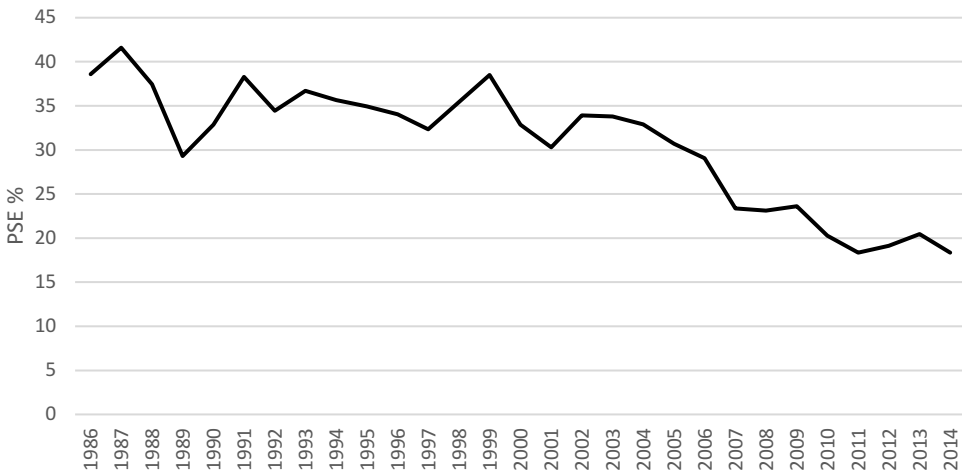


Figure 1.2. Agricultural support estimate for the European Union (28 countries), percentage PSE, 1986-2014

Source: OECD (2016)

There is also not much existing work relating to the empirical analysis of rent-seeking behaviour in the EU agricultural sector. The author has found only a few papers dealing with the problem of lobbying under the CAP. For example, in one of his earlier papers, Olper (1998) examined seven EU countries over fourteen years and found that national indicators of lobbying by farmers partially explained the variation in total agricultural support. However, Jonnson (2007) argues that because

²³ For a theoretical approach to rent seeking under the CAP see Nedergaard (2006) and Bednarikova and Jilkova (2012).

²⁴ Caution must be applied, however, when using the PSE as a measure of political rent in agriculture, since it is calculated taking account of the difference between domestic and world prices, which is not always the result of government action.

the CAP is set as an overall EU policy, lobbying as a collective action by farmers should also be analysed at international level. Hence he assessed the influence of EU-wide interest groups on the CAP, analysing the activity of fifteen commodity groups over eighteen years. The results of that study suggest that Euro-group lobbying has been able to influence the CAP.

The contemporary subject literature deals not only with the origin and size of the political rents received by particular interest groups, but also with the issue of free-riding. Since the CAP is a community-wide policy, it represents a form of public good, from the consumption of which no-one may be excluded. However, the lobbying costs incurred in obtaining the political rent are not distributed equally among beneficiaries (Czyżewski, Kułyk 2013). This is therefore a classical example of free-riding in Olson's sense. The phenomenon has been studied by, among others, H. Furtan, J. Sauer and M. Jensen (2009), and A. Zawajska (2011). Both of those papers provide a comparison between the contributions of particular EU countries to the total membership fees paid to the agricultural lobbying organisation COPA, and the share of CAP funds received by the same countries from the EU budget²⁵.

Conclusions

This paper has presented and explained some basic concepts of the public choice theory, which might serve as a background for explaining the high level of support for farmers in the European Union. It defines the political rent problem and discusses the mechanism of rent seeking. It also explains the relation between rent-seeking activities and the collective action theory. The review of the literature on rent seeking and collective actions suggests that these theories provide at least a partial explanation of the level of political rents and lobbying actions in European agriculture. The position of agricultural lobbying results from the relatively small and homogeneous groups, a good organisation, and a weak opposition on the part of consumers.

Although the theoretical literature on issues of rent seeking and collective actions at worldwide level is vast, not much empirical work has been done with regard to these problems under the Common Agricultural Policy. There is certainly a need for

²⁵ It was found that in 2005, the year analysed, the three large founding members of the European Communities – Italy, Germany and France – received a significantly higher percentage of the total CAP subsidy than their contribution to COPA fees. Those countries' "free-riding" was financed chiefly by Belgium, Luxembourg, the Netherlands and Sweden. Hence the surprising finding, not commonly recognised in the literature, that the larger CAP beneficiaries are free-riding on countries which benefit less. However, such a conclusion is controversial and not straightforward, because those countries are among the highest net payers to the EU budget and therefore the higher receivers.

more research to precisely identify the mechanisms by which lobbying influences the CAP. It would also be useful to investigate the interactions between lobbying at EU level and at national level, since although the CAP is an EU-wide policy, there are also other national policies (such as tax policies) which affect the rents obtained by farmers. What is more, with the accession of new member countries the EU agricultural policy is becoming more complex and lobbying activities are consequently becoming more sophisticated, and there is an ever greater possibility of free-riding behaviour.

Part 2.

International Perspective. Sustainable Development of Agriculture and Political Rents

2.1. The sustainability of agriculture in the European Union against a global backdrop

(Walenty Poczta, Agnieszka Baer-Nawrocka²⁶)

Introduction

The principal function of world agriculture is to produce the raw materials required to feed the human population. Given the growing scale of ecological problems, a complementary function has become the reduction of the external costs accompanying production processes, and the production of public goods of an environmental nature. At least in the short term, there is a conflict between these two functions, as the need to increase output implies an increase in the intensity and area of cultivation, while the need to protect the environment implies an extensification of production. These issues are fundamental to the economics of sustainable development²⁷. This is often defined as the satisfaction of basic human needs with the simultaneous preservation and active maintenance of the systems ensuring life on Earth (Rogall 2010). Majewski (2008) writes that “*all human actions on Earth should be economically vital, ecologically safe and socially acceptable.*” According to that author’s analysis, the essence of sustainable agriculture should be its lasting nature, which is dependent on friendliness to the environment, social acceptance and economic effectiveness. To supplement these assumptions, it should be noted that alongside the neoclassical allocative efficiency, the sustainable development of agriculture also requires adaptive efficiency. Kozuń-Cieślak (2013) observes that the concept of adaptive efficiency was introduced by D.C. North, who identified it as a condition for sustained economic growth. Adaptive efficiency reveals itself in the long term, and is related to the elasticity of the institutional structure. It is manifested in the ability to accumulate knowledge, and to create forms of cooperation and creative attitudes favouring increased well-being. Applying this concept to sustainable agriculture, a significant issue will be the ability of agriculture to adapt to varying conditions, assuming that institutional support is provided for those processes.

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²⁷ The issue of sustainable development is widely discussed in the literature, with various levels of analysis and differing viewpoints presented, for example, by Atkinson et al. (1997), Faucheux et al. (1998), Baum (2011), Fiedor and Jończy (2009), Lawn (2006), Majewski (2008), Matuszczak (2013), Rogall (2010), Woś and Zegar (2004), Sadowski (2012), Wrzaszcz (2012), and Zegar (2012, 2015).

FAO estimates indicate that, given the expected rise in the global population to 9 billion by 2050, agricultural production will need to be increased by at least 60% (FAO 2015). It must therefore be asked, firstly, whether modern agriculture is capable of ensuring food security at present and in the future, and secondly, whether this can be done in conjunction with sustainable development. With regard to these issues, an evaluation will be made here of the sustainability of European Union agriculture in comparison with agriculture worldwide. Consideration will be given to matters relating to economic, social and environmental balance, against a backdrop of resource-related and structural determinants. Determinants arising from nature are omitted, these having an exogenic character and being subject to human influence only to a relatively limited extent. Historical determinants are also neglected, since although these are anthropogenic, they are fixed and no longer subject to the influence of contemporary humanity²⁸.

Resource-related and structural determinants

Approximately one-third of the world's total agricultural land is in Asia, 24% in Africa, and 19% in Europe and North America (Table 2.1.). Agriculture in the EU uses only 3.8% of the world's agricultural land resources. However, it concentrates 13.1% of productive assets, including more than one-quarter of all machinery and equipment. A similar quantity of productive assets is found in North American agriculture. The value of productive assets per hectare of agricultural land in the EU is more than three times the world average, and twice the value for North America. Another region with a relatively high index of technical equipment to land use is East Asia, which has 16.6% of the world's productive assets, equivalent to US \$1400 per hectare of agricultural land. Extremely low values of the ratio of capital to land are found in Africa and Central Asia. These patterns are reflected in the productivity of land. This is highest in the EU and in East Asia, where it is close to three times the world average, and lowest in Central Asian and African agriculture. The latter are also regions where agriculture accounts for a large percentage of the total workforce (approximately 60% in Sub-Saharan Africa). In South Asia almost half of the working population is employed in agriculture. The situation is very different in the EU and North America, which account for only 1% of the world's total agricultural workforce, and where the percentages of workers engaged in agriculture are 4.5% and 1.7% respectively. In North America, one person working in agriculture has available approximately 50 times more land and 70 times more productive assets

²⁸ Use is made in this chapter of extracts from the work titled *Możliwości trwałego i zrównoważonego rozwoju rolnictwa – refleksje na tle Deklaracji Warszawskiej* (Poczta W.), which appeared in *Ekonomia jest piękna?*, Hardt Ł., Milczarek-Andrzejewska D. (eds.), Wyd. Naukowe Scholar, Warsaw 2015.

Table 2.1. Selected data relating to agriculture (2013)

Item	World	Africa	North America	South America	Central Asia	South Asia	West Asia	East Asia	Europe	of which:	
										EU	
Agricultural land ('000 ha)	4 928 929	1 172 201	470 926	618 579	293 063	317 128	272 105	637 604	469 910	186 356	3.8
% of total	100.0	23.8	9.6	12.5	5.9	6.4	5.5	12.9	9.5		
People professionally active in agriculture ('000)	1 324 976		2 542.1						14 179.1	10 238.3	
Productive assets ¹ (US\$ m) ²	5 356 831	526 417	719 649	533 859	106 480	686 365	258 672	887 564	980 267	699 262	
% of total	100	9.8	13.4	10.0	2.0	12.8	4.8	16.6	18.3	13.1	
of which: machinery and equipment (US\$ m) ²	1 274 402	19 791	304 011	49 386	15 099	81 427	42 503	320 610	385 885	322 617	
% of total	100	1.6	23.9	3.9	1.2	6.4	3.3	25.2	30.3	25.3	
Relations between production factors											
agricultural land per worker (ha)	3.7	x	185.3	x	x	x	x	x	33.1	18.2	
assets per worker (US\$ '000)	4.0	x	283.1	x	x	x	x	x	69.1	68.3	
assets per ha agricultural land (US\$ '000)	1.1	0.4	1.5	0.9	0.4	2.2	1.0	1.4	2.1	3.8	
Value of agricultural production (gross) (US\$ m)	3 904 001	298 156	352 197	370 422	16 570	383 208	119 664	1 389 100	573 824	413 444	
% of total	100	7.6	9.0	9.5	0.4	9.8	3.1	35.6	14.7	10.6	
Rates of agricultural productivity											
of land (US\$/ha)	792	254	748	599	57	1208	440	2179	1221	2219	
of labour (US\$/worker)	2 946.5	x	138 545.5	x	x	x	x	x	40 469.7	40 382.1	
of assets (US\$/US\$ assets)	0.73	0.57	0.49	0.69	0.16	0.56	0.46	1.57	0.59	0.59	
Gross added value per worker (US\$) ³	1 254.3	723.5 ⁴	3 893.2	4 728.7		714.4		921.7	11 453.7	25 323.6	
Contribution of agriculture to GDP (%)	3.1	14.7 ^b	6.4	5.2		19.1		4.0	2.0	1.6	
Percentage of total workforce working in agriculture (%)	19.8	59.5 ^a	24.9	16.0		49.2		9.8	8.4	4.5	
Arable land per person (ha)	0.2	0.2	0.6	0.3		0.2		0.1	0.2	0.2	
Number of individual farms as proportion of total number of farms (%)	92–98	62	83	18		85		68	97	97	

¹ – includes machinery, equipment, melioration, irrigation and other devices increasing the productivity of land, livestock, permanent plantations; ² – 2007 at 2005 fixed prices; ³ – 2005 fixed prices; ⁴ – data given for Sub-Saharan Africa

Source: FAOSTAT 2016, World Bank 2016, own calculations

than the world average. In the case of EU agriculture the asymmetry is less marked – one agricultural worker has almost 5 times more land and 17 times more productive assets than the global average. This results in more than 13 times higher labour productivity, and only a little over 20% lower productivity of assets, despite the much higher level of those assets.

According to FAO data, the world's total number of farms is close to 570 million. Approximately 92–98% of them are individual farms, accounting for approximately 56% of agricultural land globally (Table 2.1.). This form of ownership is least predominant in South America. In the two largest countries of that region – Brazil and Argentina – alongside family farms applying traditional production methods, and often functioning at social minimum levels, there is a large group of modern farms (*neolatifundios*) which carry out agricultural production and processing of agricultural and food goods at very high levels of technical and technological advancement. In Paraguay, one of the least developed countries of South America, 80% of the agricultural land belongs to approximately 3% of landowners, who run farms covering up to several hundred thousand hectares, but adopt extensive production practices (Falkowski, Kostrowicki 2005). As Falkowski and Kostrowicki (2005) note, a high degree of diversity in terms of farm size and ownership is found in Africa – from units dominated by primary agriculture and with a high degree of common land ownership (Central Africa), and small individual farms (mainly in northern Africa), to the industrialised market farms found chiefly in southern Africa.

According to the report titled *The State of Food and Agriculture. Innovation in Family Farming*, on a worldwide scale as many as 72% of family farms, which the FAO identifies with individual agriculture, have less than one hectare of land; these account for just 8% of the world's total agricultural land. The next 12%, having areas of 1–2 ha, account for 4% of the total. Therefore 84% of farms control only 12% of agricultural land, the average size of these farms being 1.2 hectares. On the other hand, 1% of farms control 65% of total agricultural land. In the most highly developed countries there are close to 22 million farms, with an average area of 57 ha (in these countries, farms above 50 ha represent 9% of the total number, but control 82% of agricultural land) (*The State of ...* 2014).

As noted above, individual agriculture is identified in FAO analyses with family agriculture. Family farms are defined there as units run and managed by households, where productive processes primarily make use of the labour of family members, chiefly the head of the household. The family and farm are connected, develop in tandem, and combine economic, environmental, social and cultural

functions (Garner, Gender 2013)²⁹. The family character of farms is fundamental to the European Model of Agriculture, shaped to a large extent under the influence of the agricultural policy implemented in the European Union for more than 50 years³⁰. On family farms the basic factors of production belong to the owner (or the family) who acts as a manager, labour is provided mainly by the owner and the owner's family, and ownership and the method of management are passed down from generation to generation. There is no separation between the household and the productive farm, and the economic result is the income obtained (Tomczak 1997). Under the European Model of Agriculture, it is on family farms that the sustainable development of European agriculture is to be realised.

Despite the absence of a single definition of family farms in theory and in practice, it is fairly widely accepted that such a farm should be the principal or sole source of income for the family, and its products (as a basic economic category) serve to meet the needs of both consumption and production. Such farms should be capable of recreating their productive potential, extended reproduction and innovation (Michna 2008).

The synthesis of the economic capacities for the maintenance and development of family farms is therefore an agricultural income large enough to provide conditions of durability at a given place and time. In this context it will be useful to consider how the European Agricultural Model is situated against the backdrop of family farming on a global level.

Economic and social sustainability

A value relatively close to the income that can be obtained by a person working in agriculture, and well reflecting the economic situation of such people, is the gross added value. In North America this is close to US\$69,500 per worker, in the EU more than US\$25,000, and in world agriculture only US\$1,254 on average (Table 2.1.). The productivity of labour in agriculture in South America, the Middle East and North Africa is around 15-18 times lower than in North America and 5-6 times lower than in the EU. In other world regions the gross added value per worker is extremely low, standing at slightly over half of the world average. In these regions

²⁹ The FAO does not define "hard" identifiers of family agriculture. Generally speaking, there is no universally applied definition of a family farm, either in the subject literature or in farming and social practice. The concept is defined using a variety of criteria, social and cultural as well as economic.

³⁰ The most characteristic feature of the European Model of Agriculture is the sustainable development of the agricultural sector and the multifunctional character of agriculture, in conjunction with the multifunctional development of rural areas. The model corresponds to a large degree to the premises of economically, socially and environmentally sustainable agriculture (Woś, Zegar 2004).

the value added per worker per day is less than 2 US dollars, while support for agriculture from public funds is extremely modest, and in many countries nonexistent. Moreover, farming families in poorly and moderately developed countries are usually large, and hence the value added per family member will be lower accordingly, often below 1 US dollar daily. It can be concluded that in the great majority of countries the level of income obtained on the largest number of farms excludes the possibility of economic and social sustainability. In this light it is not possible to speak of full sustainability of agricultural production on a global scale³¹. It may also be suggested that, globally, the inadequate incomes obtained in agriculture are the principal obstacle to its sustainable development. This is not changed even by the lack of market connections and the autarchic nature of farms in many poorly developed countries. From a formal standpoint, the products taken from one's own farm constitute the family's income, but more importantly the sum of income in cash and in kind is so low that the family seeks possibilities of changing its social status at every opportunity. Farms in developed countries are often sustainable through compulsion, and consequently do not fulfil the FAO criteria defining family farms. The low level of per capita income excludes the performance and realisation of cultural and social functions, and such farms frequently operate without respect for the natural environment.

As regards agriculture in the EU, research by Poczta et al. (2015) shows that 30% of farms are family farms that fulfil the tenets of three-dimensional sustainability: economic, social and environmental³². These farms account for approximately 51% of all agricultural land and three-quarters of agricultural production in the EU. In the future, particularly in conditions of growth in non-agricultural income, chiefly in the new member states, the number of farms meeting the full set of criteria for family (sustainable) agriculture may fall rapidly, although the land resources used by those farms should not be expected to decrease. The authors suggest that the Common Agricultural Policy favours and should favour their development. At the same time, they note that in many EU countries a significant role is played by very large individual farms (not having the features of family farms, basing production on hired labour) or by farms belonging to groups or corporations. In the authors' view, even these forms of farming, provided that specified conditions are met, may be carried on in a sustainable manner.

³¹ Family agriculture accounts for more than 50%, and according to some FAO data even 80%, of total agricultural production (*Putting Family Farmers ... 2014*).

³² To distinguish family farms among the farms analysed by the FADN, the authors adopt the assumption that, firstly, such a farm should be the farmer's (or the farmer's family's) individual property, and secondly, farm income per FWU (family work unit) should be at least at the level of the minimum wage for the economy as a whole.

Environmental sustainability

Agriculture, being dependent on the environment, actively exerts influence on certain environmental parameters. Zegar (2012) notes that agriculture has a significant impact on climate, being responsible for almost one-third of anthropogenic climate change³³ and to a certain extent for biodiversity loss. Climate change, in turn, impacts the condition of agriculture, and hence also the food security of particular communities. Agriculture is therefore both one of the culprits and a victim of climate change (Gregory et al. 2005). At the same time, negative environmental impact is frequently blamed on the conventional system of agricultural production (Kośmicki 2009b, Zegar 2012) used chiefly in countries with a high level of socioeconomic development. Nonetheless, research by Sadowski (2015a) shows that, globally, the greatest quantity of greenhouse gases emitted per unit area of agricultural land is found in less developed countries, which use an extensive system of agricultural production. That author notes that the pollution associated with food production (quantity of greenhouse gases produced by agriculture, per capita) is lower in these countries than in more developed ones only in view of the high density of population. This leads to the conclusion that traditional systems, as well as failing to ensure food security, in many cases also generate high ecological costs (Sadowski 2015a).

It is a cause for optimism that in the period from 1961 to 2009 all continents recorded a certain degree of improvement in the parameters relating to greenhouse gas emissions (Figure 2.1.). Moreover, it was European agriculture that made the greatest progress in reducing quantities of such gases emitted per kcal of agricultural production. In 1991-2009 pollution from agricultural production in Europe per capita fell by 22%, and despite the high density of population, this is relatively low on a global scale. However, Europe has one of the highest figures for pollution produced per hectare of agricultural land, which is understandable in view of the small area used for food production per capita – while on the other hand it is the only world region in which agricultural greenhouse gas emissions per hectare have fallen in recent years (by 12%). This results to a large extent from changes made to agriculture in the EU and may be linked both to the implementation of pro-environmental policy in agriculture, particularly since the early 1990s when the MacSharry reform realigned the principles of the Common Agricultural Policy, and to scientific and technological progress (Sadowski 2015b). In most other regions of the world the ecological “costs” of agricultural energy production are higher than in European agriculture. This even applies to North America, a fact that may be linked to the rapidly progressing concentration of production. Of particular note is the situation in Africa, where despite the low unit efficiency of production and significant food

³³ Including approximately 50% of methane (CH₄) emissions and 70% of NO₂ emissions.

supply problems, the ecological costs of production are, comparatively, the highest (Figure 2.1.).

The cited research shows that there is no country anywhere in the world where the food production goal and a full spectrum of ecological goals might be realised simultaneously in the short term; there is a competition between the two types of goals. In the long term there is no alternative to the attainment of both goals – the rising population and the need to eliminate famine and undernourishment require growth in food production, and to achieve such growth agriculture requires an undegraded environment, which is a necessary condition for the maintenance of productive capabilities.

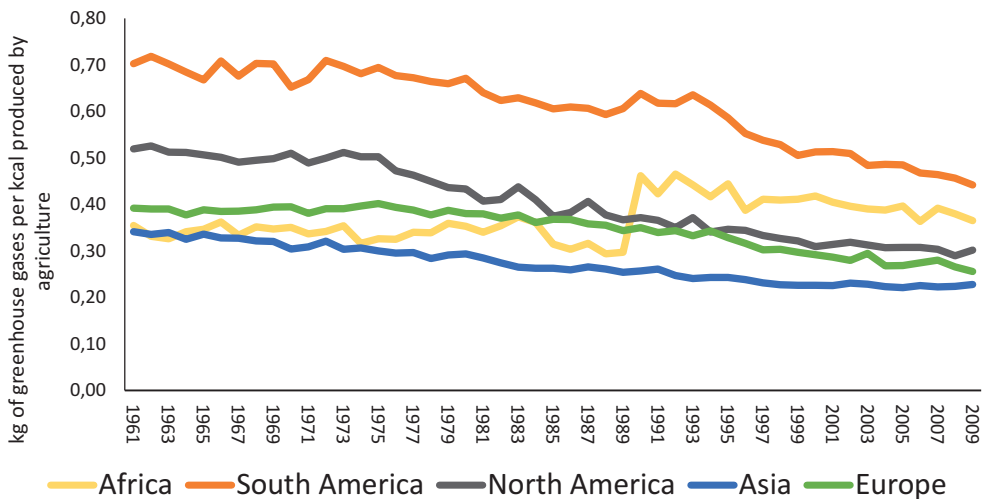


Figure 2.1. The ecological “costs” of agricultural energy production by continent in 1961-2009 (kg of greenhouse gases per kcal produced by agriculture)

Source: Sadowski A. (2015b)

Conclusions

It can be concluded from the foregoing analysis that, from a global perspective, it is European agriculture that most fully conforms to the tenets of balance and sustainability. Relative to world agriculture it is economically effective (under the institutional conditions guaranteed by the CAP), it meets varied economic and social needs, and the environmental burden caused by its development is decreasing. The costs of bringing about this state of affairs are unquestionably high, and could not be implemented at present in developing countries for economic reasons; moreover, there is a need for the appropriate development of institutions providing strong regulations for the functioning of agriculture. A pattern can be noticed where at a

certain (earlier) stage of development the targets that are necessary in the short term (increased food production) take precedence over other urgent goals (care for the environment). Furthermore, the model for the development of agriculture in the EU would appear to be better suited for imitation in other relatively densely populated countries, where the area of land used for food production per capita is small. Possibilities for the simultaneous attainment of environmental and food production goals are different, and probably less challenging, in conditions where areas of food-producing land per capita are large, and problems of undernourishment then also occur far less frequently.

A much less encouraging picture is presented of the situation of family agriculture globally, and its contribution to the balanced and sustainable development of the sector and of overall socioeconomic and environmental relationships. It can be estimated that on a global scale, the tenets of sustainability and balance are fulfilled by a far smaller percentage of farms than is the case in the EU. This applies both to highly developed countries with an excessive concentration of agricultural production (such as in North America), meaning that the goal of environmental balance is achieved only to a very limited extent, and to regions where small, economically marginal farms are predominant, where apart from the lack of economic sustainability there is often a failure to adhere to good agricultural practices (as in Africa). Therefore, in worldwide agriculture the requirements of economic or environmental sustainability, and in many cases both, are fulfilled to a lower degree than in the European Union.

2.2. A sustainable bioeconomy in Europe – the European Union’s policy and strategy

(Jarosław Gołębiewski³⁴, Kazimierz Pająk³⁵)

Introduction

The change in the vision of economic development from one based on fossil fuels to a system in which significantly greater use is made of renewable materials of biological origin, as well as progress and innovations in biotechnology and the natural sciences, have stimulated the formulation of new strategies and policies relating to the bioeconomy. In many countries in recent years, separate strategies and policies have been adopted relating to biotechnology, products of biological origin, and bio-industry. More and more often, however, all of these strategies are combined into cohesive, integrated bioeconomy strategies, in which nations define their vision of coordinated action to protect biodiversity, to ensure food safety, to develop industrial production using materials of biological origin, and to reduce climate change.

The first published strategy relating to the bioeconomy was a document from the Organisation for Economic Co-operation and Development titled *The Bioeconomy to 2030: Designing a Policy Agenda* (OECD 2009). This stated that progress in biotechnology and the natural sciences creates opportunities to solve many of the problems that the world faces, particularly with respect to health and limited supplies of raw materials. Biotechnology is the foundation for the development of the bioeconomy, and the OECD indicates that both the public and private sectors must take active steps to ensure that maximum use is made of its potential. The OECD study is an extensive document setting out the concept of the bioeconomy and directions for its development. The document presents the situation in the bioeconomy in 2009, describes its status in 2015 and indicates possible scenarios up to 2030.

The aim of this chapter is to assess the bioeconomy strategy of the European Union. An analysis will be made of the EU strategy drawn up by the European Commission. The evaluation of this bioeconomy strategy will be preceded by remarks concerning different interpretations of the concept, the key social challenges that influence its development, and its importance in rural area development. The method applied includes the search for, identification, analysis and assessment of relevant EU programming documents and studies found in the subject literature.

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Towards a broad definition of bioeconomy

The term *bioeconomy*³⁶ first appeared in the scientific literature towards the end of the twentieth century. It was related to the development of biotechnology and its practical application in many branches of the economy. In an article in *Science* in 1998 (Enriquez 1998), Juan Enriquez stated that discoveries in genomics were creating a new sector in the global economy, related to the natural sciences. To begin with, the concept of bioeconomy was used chiefly in terms of applications of biotechnological discoveries in processes of industrial production. This interpretation is reflected, for example, in the OECD's definition, according to which the bioeconomy uses advanced technological knowledge and renewable biomass to produce various types of products. The use of biotechnology leads to an increase in output and economic benefits (OECD 2009). In subsequent years many new approaches to the concept were developed. Attempts have also been made in the scientific literature to systematise the terminology used and its definitions. This problem has been taken up by, among others, Maciejczak and Hofreiter (2013), Ascham Associates (2010), Schmid et al. (2012), and Smeets et al. (2015).

An analysis of these publications shows that there are large differences in the ways of understanding the concept of bioeconomy. Among the many different positions, two fundamental approaches may be distinguished. In the first, the bioeconomy is seen from an industrial perspective, while in the second it is viewed in terms of public goods. Each of these approaches determines a different direction of development for systems of agricultural production and indicates a different role for agricultural producers in those systems. The view of the bioeconomy as a further stage in the industrialisation of agriculture can be found in the cited publication of the OECD (2009) and in the positions of many international corporations operating within the broad agricultural-industrial complex. According to the OECD report, the bioeconomy encompasses the production, using knowledge from the life sciences, of new sustainable, ecological and competitive products. A similar approach is developed in the BECOTEPS project, the report of which states that the bioeconomy refers to sustainable production and the processing of biomass into food, industrial products and energy. Renewable biomass includes all biological material (produced in agriculture, forestry and animal production, including fishing) which can be used as a raw material (BECOTEPS 2011). Biomass, also taken to include organic wastes, is a valuable substitute for fossil fuels. In this context attention is often drawn to

³⁶ Terms found in the economic literature include “biobased economy” (BBE) and “bioeconomy” (BE). Although both of these refer to the concept of making economic use of renewable resources of biological origin, sometimes there are significant differences in the ways in which they are defined. Often, however, they are used interchangeably. In the present work only the term “bioeconomy” will be used.

the need to increase the production of biomass, including through changes in the structure of agricultural crop production. To achieve this, there must be progress in genetics to enable the necessary changes to be made in the technology and structure of agricultural production. Similar approaches are found in strategic documents relating to the bioeconomy in the United States. In 2011 a report was published by the US Department of Agriculture, presenting a set of indicators for measuring the growth and effectiveness of the bioeconomy, in which it is stated that the bioeconomy encompasses activities relating to the production and distribution of bioproducts. Bioproducts are understood as commercial or industrial products (other than food and animal feed) which consist – wholly or in a significant part – of biological products, including renewable agricultural raw materials and forest materials (USDA 2011). In turn, in a document published in 2012 titled *National Bioeconomy Blueprint*, referring to the OECD publication, it is accepted that a bioeconomy based on research and innovations in the biological sciences creates economic activity and generates social benefits (White House 2012).

A focus on biomass and biotechnology (based on genetic modifications in particular) places limits on the development of the bioeconomy, since it overlooks industries and sectors which produce or otherwise make use of biological resources (such as agriculture, food production, fisheries and forestry). For this reason, the predominant industry-based definitions are often criticised as being too narrow, particularly since they reduce the role of agriculture to merely supplying biomass, and give prominence to the concept of *novel food*³⁷. The industrial perspective on the bioeconomy promotes quality as a set of measurable features characterising food products (Levidow et al. 2012). However, this perspective ignores the importance of agriculture in the production of traditional and regional products, the significant progress in the technology of agricultural production and in food science, the contribution of farmers to the development of rural areas through social and organisational innovations, and the public goods as well as social and environmental benefits that agriculture supplies (Matuszczak 2007, Brelik, Matuszczak 2013). The importance of agriculture in this context is underlined in many academic works

³⁷ According to Regulation (EC) No 258/97 of the European Parliament and of the Council of 27 January 1997 concerning novel foods and novel food ingredients, the definition of novel foods includes the following categories of food and food ingredients: those with a new or intentionally modified molecular structure; those consisting of or isolated from micro-organisms, fungi or algae; those consisting of or isolated from plants and food ingredients isolated from animals, except for foods and ingredients obtained by traditional propagating or breeding practices and having a history of safe food use; and those to which has been applied a production process not currently used, where that process gives rise to significant changes in the composition or structure of the foods or food ingredients which affect their nutritional value, metabolism or level of undesirable substances (Regulation...2016)

(Adamowicz 2005, Majewski 2008, Zegar 2008, Cooper et al. 2009). In the report of the Standing Committee on Agricultural Research (SCAR) it is also stated that when the concept is viewed from an industrial perspective the human factor vanishes, and industry is seen as the main player in the bioeconomy (Freibauer et al. 2011). This means that the structure of the bioeconomy encompasses only part of what agriculture is and should be.

Hence to ensure long-term economic growth, the bioeconomy should not be defined too narrowly. Former agriculture commissioner Franz Fischler defined the bioeconomy more broadly: as a production paradigm which is based on biological processes and, as a natural ecosystem, makes use of natural resources while using minimal quantities of energy and not producing waste, since all materials rejected by one process are reused in another (Ascham Associates 2010).

The definitions used in various strategic documents and scientific studies often focus on identifying the sectors that make up the bioeconomy. An example of such a definition is the formula adopted at a conference on the bioeconomy, which states that it includes all branches of the industry and sectors of the economy that produce and use resources of biological origin, such as agriculture, the food industry, fisheries, forestry, etc. (European Commission 2005b). In the seventh framework programme, an important objective of which was the building of a knowledge-based European bioeconomy, it was stated that the term “bioeconomy” includes branches of the industry and sectors of the economy (such as agriculture, food production, fisheries and forestry) engaged in the production and use of biological resources (DG Research 2007).

The concept of the bioeconomy was further developed with the European Commission adopting the document *European Strategy and Action Plan towards a sustainable bio-based economy by 2020*. According to that document, the bioeconomy includes all sectors of the economy which produce and process biological resources originating from the land or sea environment. The bioeconomy is a tool for the attainment of political goals, which include, among others: strengthening of European leadership and creativity in the biological sciences; optimisation of innovation and systems of knowledge transfer; research into food safety; improved effectiveness of agriculture and food processing and distribution; increased competitiveness of European industry and agriculture; and reduced emissions of greenhouse gases and waste (European Commission 2010a).

With the aim of preparing a comprehensive strategy for the bioeconomy, in 2011 the European Commission took a series of actions to develop a cohesive concept. These included consultations on the subject of a renewables-based economy, which resulted in the formulation of a more precise definition of the bioeconomy. In the published consultation report it is stated that the bioeconomy is “[...] a low waste

production chain starting from the use of land and sea, through the transformation and production of bio-based products adapted to the requirements of end-users. More precisely, a bio-based economy integrates the full range of natural and renewable biological resources – land and sea resources, biodiversity and biological materials (plant, animal and microbial), through to the processing and the consumption of these bio-resources. The bio-economy encompasses the agriculture, forestry, fisheries, food and biotechnology sectors, as well as a wide range of industrial sectors, ranging from the production of energy and chemicals to building and transport. It comprises a broad range of generic and specific technological solutions (already available or still to be developed) which could be applied across these sectors to enable growth and sustainable development, for example in terms of food security and requirements for industrial material for future generations” (European Commission 2011a).

A broader understanding of the bioeconomy is found in the European Commission communication of 2012 (European Commission 2012a), and particularly in the accompanying working document. As regards defining the bioeconomy, a significant role was played in particular by the first document, which states that the introduction of a bioeconomy in Europe offers a significant potential: it is able to stimulate and maintain economic growth and create jobs in rural, coastal and industrial areas; reduce dependence on fossil fuels, and contribute to improvement in the economic and environmental balance of basic production and processing industries. The bioeconomy therefore makes a significant contribution to attaining the goals of the flagship initiatives of the Europe 2020 strategy (European Commission 2012a).

In the Commission staff working document, the bioeconomy is defined as encompassing the production of renewable biological resources and the transformation of those resources and the waste stream into products with added value, such as food, animal feed, bioproducts³⁸ and bioenergy. Its sectors and industrial branches³⁹ have significant potential for innovation, because they make use of a wide variety of branches of science and supporting and industrial technologies⁴⁰, as well as local and hidden knowledge (European Commission 2012a). This document indicates that the bioeconomy strategy will support ecosystem management and will lead towards synergy with the Common Agricultural Policy (CAP), Common Fisheries Policy

³⁸ Bioproducts are products originating in whole or in part from materials of biological origin, except for materials deposited in geological or fossil formations.

³⁹ The bioeconomy includes the sectors of agriculture, forestry, fisheries, food, and paper and pulp production, as well as certain sectors of the chemical, biotechnological and energy industries.

⁴⁰ The bioeconomy is based on the biological sciences, agronomy, ecology, food science, social sciences, biotechnology, nanotechnology, information and communication technologies and engineering.

(CFP) and other EU policies. It is emphasised in the document that the full potential of a sustainable bioeconomy should be developed to an ever greater degree through connections with public goods and the very important role of farmers.

The bioeconomy and contemporary social challenges

The start of the 21st century starkly revealed the increasing scale of social problems at European and global level. The limited nature of natural resources, loss of biodiversity, climate change, food security issues, dependence on fossil resources, and most generally, the need to ensure sustainable growth represent a significant challenge for policymakers, who need to produce a concept for a cohesive response to these problems. In view of its wide-ranging nature, the bioeconomy is seen as a system which may assist comprehensively in addressing interrelated social challenges and form a basis for a new wave of economic growth, based on the use of renewable sources, natural and environmentally-friendly biological resources, and efficient recycling technologies (Figure 2.2.).

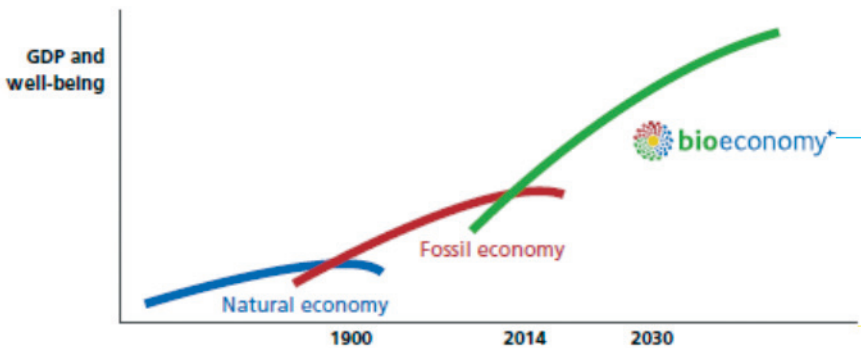


Figure 2.2. The bioeconomy as a new wave of economic growth

Source: *Sustainable growth...*(2014).

The document accepted by the European Commission in 2012 titled *Innovating for Sustainable Growth: A Bioeconomy for Europe* (European Commission 2012a) defines five specific social problems which can be expected to be solved through the development of the bioeconomy. These are: assurance of food security, sustainable use of natural resources, reduction of dependence on non-renewable resources, reduction of and adaptation to climate change, and the creation of jobs and maintenance of Europe's competitiveness.

The assurance of food security is becoming a key challenge for the modern economy. Demographic forecasts of significant growth in the world population in the coming decades make it necessary to consider the growing demand for food,

including in particular animal products. According to the Commission, the increase in the world population by 2050 will cause a growth in food needs of 70% and a doubling of meat consumption. The development of the bioeconomy can be expected to help meet this challenge. Through investments in scientific research supporting growth in basic production, changes in production and consumption models and the development of healthier and more sustainable ways of eating, we can expect to see a change of balance in demand-supply relationships in the food market. There also should be a reduction in waste, both in the food production sector and in households. The concept of the bioeconomy also assumes support for and development of more resource-efficient and effective food supply chains.

Another social challenge which may be addressed with the support of the bioeconomy is the problem of the sustainable management of natural resources. Many sectors of the world economy, including agriculture, forestry, fisheries and fishing, make use of a range of limited resources. These include not only space on land and sea, soil, water and ecosystems, but also means of production such as minerals and energy, for example for the production of fertilisers and chemical agents. The use of these often causes adverse effects on ecosystems. Growing needs for biomass will in the future increase demand for the resources used in its production, leading to a greater pressure on the environment. The concept of the bioeconomy in this context provides for the development of research and innovations which will make it possible to increase productivity while ensuring the sustainable use of resources and limiting the negative environmental impact. It also draws attention to the need for a change of the approach to management and policy (Czyżewski, Majchrzak 2016). Management in the bioeconomy must take account of environmental aspects and the maintenance of existing ecosystems, and in the policy supporting economic growth there is a need for synergy and complementarity between the actions taken. At EU level this applies in particular to the common agricultural and fisheries policies (CAP and CFP), integrated maritime policy and EU environmental policy relating to resource efficiency, sustainable use of natural resources, protection of biodiversity and habitats, and provision of ecosystem services.

A significant problem for many countries, and also for the European economy, is the significant dependence on non-renewable resources. The European economy is based to a large extent on fossil fuels, which means that it is dependent on uncertain and shrinking supplies and the increasing volatility of markets for raw materials. The maintenance and strengthening of the competitiveness of any economy currently requires the development of low-emission and resource-efficient sectors of the industry. A bioeconomic system including initiatives relating to innovative markets for bioproducts, energy technologies and the market for renewable energy can be expected to contribute to the attainment of those goals. This may also be supported

by progress in the use of alternative sources of carbon and energy (such as wastes from agriculture, forestry, and other sectors of the food economy) and the promotion of research into renewable resources such as microalgae.

With the growth in demand for biomass, for both industrial and food purposes, in the coming decades there will need to be a significant increase in the productive capacities of agriculture, forestry, fisheries and fishing. The concept of the bioeconomy provides for the development of innovative production systems with lower greenhouse gas emissions, adapted to the negative effects of climate change such as floods and droughts, and ameliorating those effects. It is anticipated that the bioeconomy will limit production processes that make intensive use of coal, energy and water, and develop economic processes that are more resource-efficient and environmentally-friendly.

The development of the bioeconomy can also be expected to contribute to job creation. According to the European Commission, even today approximately 9% of those employed in the European economy work in the sectors that make up the bioeconomy. A growth in basic production, processing of foodstuffs, industrial biotechnology and biorefining can be expected to contribute to economic growth, which will stimulate the creation of new branches of the bioindustry and new markets for bioproducts. The development of these branches and markets will generate new jobs for highly qualified workers, as well as training opportunities (European Commission 2012a).

The role of the bioeconomy in the supply of public goods and rural area development

Sectors that rely on biological processes and resources, such as those which make up the bioeconomy, have extensive links with the social and natural environments. They are therefore able to influence the state of public goods, both positively and negatively. A bioeconomy encompassing the sectors of agriculture, forestry, fisheries, food, animal feed, chemicals and bioenergy has an impact on both environmental and social public goods. Cooper, Hart and Baldock (2009) list the following as environmental public goods: the agricultural and forest landscape, agricultural and forest biodiversity, water quality and availability, functionality of the soil, climate stability, air quality, and resistance to floods and fires. In turn, the main components of social public goods are food safety, the vitality of rural areas, animal welfare, and public health.

The effectiveness of the bioeconomy may be limited by negative external effects generated by particular sectors of that economy. Reduction in soil fertility and resistance to flooding, or greater erosion, will undermine the functioning of the

bioeconomy in its environmental dimension. The bioeconomy also impacts social public goods. Public opinion in Europe would appear to attach high importance to public goods, demonstrating widespread fears concerning matters of environmental protection, particularly in terms of loss of biodiversity, amelioration of the effects of climate change, water and air pollution, and the exhaustion of natural resources, including soil quality. Hence, the inclusion of public goods under the concept of the bioeconomy may ensure persistent economic growth based on systems that are environmentally, socially and economically sustainable.

As well as noting the links between the bioeconomy and public goods, it is also necessary to consider its impact on the development of rural areas. This link has been noted in strategic documents, with the assertion that the bioeconomy may make a significant contribution to the development of rural and coastal areas, because it will promote action on both the supply and demand sides at regional level, such as the creation of supply chains of residues and wastes as raw materials for the bioproducts industry, the creation of networks of small local biorefineries, and the development of fishing infrastructure. Research and innovation play an important role in the development of these activities, and for that reason will be supported by Horizon 2020, as well as by the reformed CAP and Cohesion Policy. In particular, the cohesion policy promotes regional and local projects relating to the bioeconomy under national and regional strategies of intelligent specialisation (European Commission 2012b).

The degree to which the new plants processing biomass and bioenergy create new jobs and income will depend on policy, which may favour either large-scale centralised enterprises or other more decentralised systems with a greater involvement of farmers. As Schmid, Padel and Levidow (2012) note, a bioeconomy more oriented towards public goods may create additional opportunities for the development of rural areas, for example by:

- Increasing the value of the landscape and quality of life in rural areas as a basis for other agricultural activities such as agrotourism and ecotourism, incorporating its economic value into the development of rural areas.
- Supporting enterprises that protect green areas: the protection of greenery applies to the use of farms – livestock, plants, gardens, forest and landscape – as a basis for the promotion of psychological and physical health and quality of life for various groups of clients.
- Linking agriculture with energy production through recycling biowastes at farm level, thus reducing production costs and greenhouse gas emissions.
- Constructing short food supply chains, which will reward farmers for applying ecological methods.

- Increasing the resistance of agro-social systems with high biodiversity through built-in measures to protect against threats of infectious diseases.
- Creating attractive places of work for specialists in agriculture, horticulture, food processing and care services (Schmid, Padel, Levidow 2012).

The EU bioeconomy strategy – goals, priorities and measures

The EU strategy published in 2012 by the European Commission is titled *Innovating for Sustainable Growth: A Bioeconomy for Europe*, and is divided into two documents: a Commission communication (European Commission 2012a) and a working document (European Commission 2012b). These set out goals and present a strategy and plan of action. The working document also includes the results of preparatory work, including reports on public consultations between interested parties in European academic circles, the private and public sectors and NGOs (European Commission 2011a). The EU bioeconomy strategy is a development of the strategy titled *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth* (European Commission 2010a) and the document *A Resource-efficient Europe – Flagship Initiative under the Europe 2020 Strategy* (European Commission 2011b).

The bioeconomy strategy provides for a comprehensive approach to issues of ecology, environmental protection, energy, food supply and the management of natural resources. Its goal is to build foundations for a more innovative, resource-efficient and competitive society, in which there is no conflict between the assurance of food security and the principles of sustainable use of renewable resources for industrial purposes, combined with the protection of the environment.

The strategy sets out four priorities relating to the bioeconomy. These are: a cohesive political framework, increased investment in research, the development of markets for bioproducts, and better communication with the public (Figure 2.3).

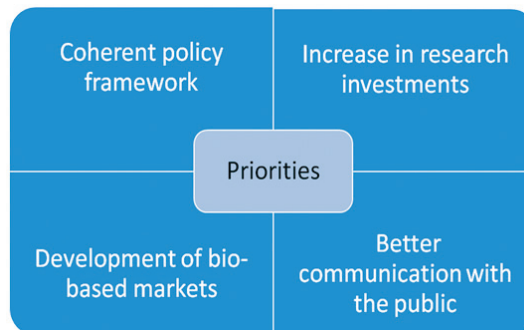


Figure 2.3. Priorities of the EU bioeconomy strategy

Source: own elaboration based on: European Commission (2012a).

The bioeconomy strategy provides for a greater interaction between different areas of policy at EU and member state level. This will make it possible to create a more cohesive political framework, which will not only guarantee public support, but also increase private investment. The development of the bioeconomy requires both public financial support and private investment, which must cohere with spending on scientific research and innovations. A dissonance often arises in practice between scientific research and the practical use of its results. This is caused both by a lack of knowledge and by institutional barriers between scientists, innovators, producers and end users. Many promising results of scientific research remain unused due to unresolved legal and patent issues. Hence the regulation of such issues, as well as investment in demonstration projects and the development of enterprise and consulting services in the whole value chain of the bioeconomy, become priority elements of the strategy.

The creation of a productive and sustainable bioeconomy requires further research, as well as the construction of rural, maritime and industrial infrastructure, a network of knowledge transfer, more effective supply chains, and biorefineries. Biorefineries enable fossil fuels to be replaced with renewables (including wastes), creating new income sources and jobs in agriculture, forestry and fisheries, particularly in rural areas. For the building of sustainable supply chains and new commercial facilities, various sources of financing may be used, including private investment and EU aid from the Rural Area Development Fund or Cohesion Fund. Bioproducts and bioenergy may serve as “organic versions” of traditional products, or else become new products with new and innovative functions supplied to both new and existing markets.

An important priority in the EU bioeconomy strategy is the creation of a participation model that engages citizens and end users so as to strengthen the links between science, society and policy creation. A more informed dialogue will enable science to create strong foundations for the development of political solutions.

A set of measures which are to be undertaken within the framework of the bioeconomy strategy is presented in Table 2.2.

This set contains 11 specific activities, divided into three groups: investment in research, innovation and skills; stronger political interaction and engagement of interested parties; and the development of markets and competitiveness in the bioeconomy.

The working document accompanying the strategy contains more details concerning both the background and the action plan than appeared in the Commission communication. It describes measures in such areas as social innovation, agriculture, fishing and fisheries, forestry, energy production, food (including waste management, safety and packaging) and biotechnology. It is therefore a detailed document covering a broad spectrum of sectors that play leading roles in the process of moving towards a bioeconomy.

Table 2.2. Set of measures serving to implement the bioeconomy strategy

Area	Measure
Investment in research, innovation and skills	<ol style="list-style-type: none"> 1. Provision of significant EU and national financing as well as private partnership and investment for research and innovation in the area of the bioeconomy. 2. Increased contribution of multidisciplinary and multisector research and innovation to address the complexity and multidimensionality of social challenges by improving the existing knowledge base and developing new technologies. 3. Publicity and promotion of the use of innovations in sectors of the bioeconomy. 4. Building the human resources required to support the growth and further integration of sectors of the bioeconomy by organising university forums serving to develop new teaching and professional training programmes in the area of the bioeconomy.
Reinforced policy interaction and stakeholder engagement	<ol style="list-style-type: none"> 5. Creation of a <i>Bioeconomy Panel</i> to increase synergy and cohesion between bioeconomy-related policies, initiatives and economic sectors at EU level in combination with existing mechanisms. 6. Establishment of a <i>Bioeconomy observatory</i>. 7. Development of international cooperation in research and innovation in the area of the bioeconomy so as to jointly face global challenges such as food security and climate change, as well as the issue of sustainable supplies of biomass (from 2012).
Enhancement of markets and competitiveness in bioeconomy	<ol style="list-style-type: none"> 8. Provision of a knowledge base for sustainable growth in basic production. 9. Promotion of the creation of networks encompassing necessary logistics for integrated and diversified biorefineries, demonstration and pilot facilities throughout Europe, including necessary logistics and supply chains for the cascading use of biomass and the waste stream. 10. Support for the development of new markets through the creation of standards and a standardised methodology for the evaluation of the sustainability of bioproducts and systems of food production, and support for operations on a larger scale. 11. Development of scientifically grounded approaches to supplying product information to consumers (e.g. food benefits, production methods or environmental sustainability) to promote a healthy and sustainable lifestyle.

Source: based on European Commission (2012a).

Conclusions

The goal of this chapter has been to evaluate EU policy and strategy relating to the bioeconomy. Attention has been drawn to the various understandings of the term *bioeconomy* found in the subject literature and in strategic and programming documents at both national and EU level. There are two approaches to defining the bioeconomy. The first and narrower approach, referred to as the industrial perspective, is predominant in, among others, documents from the OECD and the United States. This perspective is promoted by interested parties who anticipate further industrialisation of agriculture, seeing this as a potential area of activity and profit generation. The industrial perspective focuses on the potential (based on the

use of biotechnological discoveries, among other things) for increased effectiveness of resource use and improvement in global economic competitiveness. This chiefly benefits capital-intensive industries at higher levels of the value chain. A broader understanding of the bioeconomy encompasses sustainable use of natural resources, such as soil, water and biodiversity, many of which have the character of public goods. Under this approach, agricultural producers are seen as providers not only of raw materials, but also of high-quality food. They are also valued for their contribution as managers of agricultural ecosystems, landscape protection and rural area development. The concept of a bioeconomy oriented towards public goods emphasises the importance of organic and resource-efficient methods of production in agriculture and the food sector. It would appear that the bioeconomy concept should be given a significantly broader scope than is generally the case in the European Commission’s innovation policy. Development of the bioeconomy requires an integrated, comprehensive and sustainable approach to innovations, which will enable the future rational use of natural resources both in and outside agriculture, and lead to the development of rural areas.

In 2012, based on the results of social consultations, the European Commission published a strategy and plan of action relating to the bioeconomy in Europe. This strategy aims to enhance knowledge concerning the bioeconomy, encourage innovations that increase the natural productivity of resources, and support the development of production systems that reduce the adverse effects of climate change. The strategy creates a cohesive framework for a comprehensive approach to the solution of complex social problems (challenges) in Europe and worldwide. The measures undertaken with respect to the bioeconomy are focused on three pillars: investment in research, innovations and skills; strengthening the impact of the policy and engagement of interested parties; and strengthening markets and competitiveness in sectors of the bioeconomy. The bioeconomy strategy represents an important step towards solving contemporary economic and social problems. Nonetheless, attention also needs to be paid to the absence of concrete actions and new financing mechanisms. There is also a lack of precisely defined and binding targets. On the other hand, it should be noted that the bioeconomy strategy drawn up at EU level has provided a stimulus for action at national and regional level. Many EU countries have produced their own bioeconomy strategies, including Germany, Finland, Sweden, Austria, Denmark, the Netherlands and others. Moreover, a greater number of actions and changes have taken place in local and regional systems connected with the development of the bioeconomy, and particularly the bioenergy sector. A deeper analysis of the impact of actions taken at EU and national level should be the subject of further research.

2.3. Support for agriculture in the European Union and the evolution of the Common Agricultural Policy (1956-2011)

(Paweł Błaszczyk, Agnieszka Sapa⁴¹)

Introduction

The Common Agricultural Policy (CAP), one of the fundamental community policies of the European Union, came into being as a response to post-war political and economic conditions, and with regard to the particular nature of agriculture. On the one hand, in the post-war period, the countries forming the community needed to re-establish food security and to become independent of food imports. On the other hand, the actions taken reflected the universalism of the so-called agrarian question⁴² resulting from the limited possibilities of accumulation and extended reproduction⁴³. In consequence, maintaining farms' competitiveness, including their balanced development and capacity for extended reproduction, required an active state policy⁴⁴. Moreover, agriculture is found to lag behind other sectors of the economy irrespective of a country's system of government or level of economic development. However, in the initial stages of economic development agriculture helps to finance the development of the national economy, but as a country attains a higher level of development, agriculture becomes a net beneficiary of an interventionist agricultural policy⁴⁵. This is reflected in the changing interventionist instruments applied with respect to the agricultural sector, as a result of variation in both the internal and external conditions for agricultural activity. Such a transformation can be observed, for example, in the history of the Common Agricultural Policy.

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⁴² J. Wilkin (1986) describes this as the problem of agriculture's inability, in terms of its structure and functional mechanisms, to adapt to the externally existing situation. Its universal nature and constant renewal have their source in the particular features of agriculture as a sector of the economy and of the social, cultural and natural environment. The main symptom of the agrarian question is the disparity in the incomes of the rural population, resulting from the lower efficiency of production factors and insufficient flexibility of productive structures in adapting to changing market conditions (Czyżewski 2013).

⁴³ Further see e.g. Matuszczak 2013.

⁴⁴ This is addressed by e.g. Czyżewski 2010.

⁴⁵ Further see Poczta-Wajda 2013, Poczta-Wajda 2014.

The goals and principles of the CAP were formulated in the 1950s. Since that time there has been a change of priorities in EU agricultural policy, being a response both to the effects achieved by the policy and to new challenges appearing in the world economy. Successive reforms of the CAP brought about an evolution of its instruments – away from price and market intervention towards direct support for the income of agricultural producers and the development of rural areas supplying public goods (Czyżewski, Brelik 2013). It should be remembered, however, that an interventionist agricultural policy distorts the market, among other things through the higher prices obtained by agricultural producers. These differences in prices can thus be treated as a kind of political rent. It is interesting to investigate how these rents vary in EU countries along with the changing instruments of the CAP at successive stages of its evolution. This is the chief aim of the research reported here.

Directions of change in the Common Agricultural Policy

The objectives of the Common Agricultural Policy (CAP) were formulated in 1957. Its main aims were to ensure growth in agricultural productivity, an adequate level of agricultural incomes, stabilisation of the market for agricultural products, continuity of supply, and the ability of consumers to buy food at reasonable prices⁴⁶. These goals were served by specific instruments (for example, the common organisation of the agricultural market, principles for a common price policy, and funds to finance interventionist measures from the community budget), which were designed and gradually implemented, and which underwent changes over the years. The changes made to those instruments resulted both from internal factors (such as the food situation in member states and the income parity of farms) and from external ones (such as the GATT/WTO negotiations). The history of the functioning and modification of the Common Agricultural Policy can be divided into a number of phases (Table 2.3.).

The first phase, covering the 1960s (1957-1968), saw the original formulation and implementation of the Common Agricultural Policy. The instruments created were chiefly oriented towards ensuring food security and self-sufficiency by supporting growth in the volume of agricultural output. The actions taken were of the nature of price and market intervention. In other words, farmers were encouraged to increase production by maintaining suitably high prices for agricultural products, i.e. by using a market mechanism. At this stage in the CAP implementation, price was the basic element for correcting a market mechanism. The actions taken led to an adequate level of food self-sufficiency, while at the same time producing surpluses of agricultural

⁴⁶ Article 39 of the Treaty of Roma

Table 2.3. Evolution of the priorities of the Common Agricultural Policy

Food security —————→ Competitiveness —————→ Sustainability —————→ Cohesion —————→ Policy Efficiency —————→						
The Early Years (60s)	The Crisis years (70s/80s)	MacSharry Reform 1992	Agenda 2000	CAP Reform 2003	CAP Health Check 2008	CAP Reform post-2013
Price support	Over production	Price cuts and compensatory payments	Deepening the reform process	Market orientation	Reinforcing 2003 reform	Greening
Productivity improvement	Exploding expenditure	Surplus reduction	Rural development	Decoupling	Dairy quotas	Targeting
Market stabilisation	International conflicts	Income budget and budget stabilisation		Cross compliance		Redistribution
	Supply controls			Consumer protection		End of production constraints
				Environment		Food chain
				Enlargement		Research & innovation

Source: European Commission (2016)

products⁴⁷. The price-based mechanism of intervention effectively encouraged agricultural producers to increase their production, at the same time causing prices in Community agricultural markets to be higher on average than world prices⁴⁸. This also meant an increase in spending related to intervention in markets characterised by surpluses⁴⁹. At the same time, the intensification of agricultural production, indirectly supported by the price-based intervention, resulted in adverse environmental effects. All of this aroused objections from the European public, as well as international disputes. The source of the latter were, among others, the Community implementing export

⁴⁷ During 10 years (1973-1982) overall self-sufficiency in agricultural products rose from 79% to 87%. The Community production surpluses in terms of internal demand became structural, not incidental. In 1982/83, the self-sufficiency rates for sugar, wine, cereals, milk products and all meats were 147%, 125%, 117%, 118% and 100%, respectively (Commission of the European Community 1985). The result was a growing intervention buying of agricultural products. Initially, the intervention buying was focused only on seasonal surpluses of agricultural products. However, since the late 1970s the state purchase of agricultural products resulted in the systematic expansion of the stocks. For example, in 1986 in the EEC there were about 1.3 million tonnes of butter, and 672 thousand tons of beef, and 14.7 million tonnes of cereals, 283 thousand tons of olive oil, and 862 thousand of skim milk powder (Czykier-Wierzbza 2012). The management of surplus storage and the buying in of surplus products accounted for 20% of total agricultural expenditure, or 5.5 billion ECU in 1993 (Ockenden, Franklin 1995).

⁴⁸ For more about this relation (NRA indicator) see the second part of this chapter.

⁴⁹ This expenditure resulted from both the maintenance of suitably high prices for Community producers and support for the export of agricultural products to third countries.

subsidies and para-tariff barriers (mostly levies). These activities, on the one hand, artificially supported the competitiveness of EU goods in the world markets, and on the other hand, they limited access to the internal Community market for agricultural products from third countries. In view of the criticism levelled against the forms of support given, alternative instruments were sought that would have less of a distortive effect on the market and would reduce the costs of the CAP (Tomczak 2009).

The first attempts to make changes to the CAP came with the Mansholt Plan of 1968, part of the next phase of the CAP's evolution, which covered the 1970s and 1980s. The solutions presented were intended to reduce market distortion and bring about changes in agricultural structures, seen as the reasons for the weaknesses of the CAP⁵⁰. The crisis in the Common Agricultural Policy was also reinforced by the world economic crisis (Josling 2008b). The breakdown of the international currency system, the oil shock, growth in inflation and unemployment, and the slowdown in economic growth placed limits on the action of the mechanisms for determining common prices, and led to a mechanism of change in national currency prices according to "green exchange rates"⁵¹. These actions produced an imbalance between supply and demand for agricultural goods, an increase in budgetary expenditure, deeper income disparity, and the maintenance of an unfavourable agrarian structure. The Mansholt Plan aimed to reduce these dangers by creating the foundations of a socio-structural policy. The plan included proposals for, among other things, early retirement pensions for farmers passing on land for the purpose of improving the agrarian structure, assistance in enlarging or creating farms, afforestation, and reduction of the amount of agricultural land in use through a set-aside system. Although this reform was not implemented in full, it was the forerunner of the changes that would take place in the 1970s⁵² and 1980s⁵³, which involved instruments

⁵⁰ The implementation of the first stage of the CAP brought to light the systemic deficiencies in the measures adopted. These included the absolute priority given to a policy based on market-type rather than structural tools (concentration on increased production through intensification, not the elimination of structural barriers), inequality in support for different markets (intervention in markets with low rates of development), and unequal treatment of the countries of Northern and Southern Europe.

⁵¹ This mechanism enabled price differentiation between member states. In consequence, exports from low-price countries were taxed, or exports from countries with relatively high prices of agricultural products were subsidised.

⁵² In 1972 directives came into force concerning assistance for farm modernisation, farmers' ability to take early retirement and withdraw from agricultural activity, and education for persons employed in agriculture.

⁵³ In the 1980s the first instruments were applied with the aim of reducing production and stabilising the level of expenditure on the CAP. In 1984 milk quotas were introduced, and in 1988 an expenditure stabiliser was implemented (reduction in the quantity of production for which price support was guaranteed).

for correcting agricultural markets, elements of structural policy, and mechanisms for limiting budgetary expenditure. The modifications made to the CAP instruments, while they initiated the policy's structural aspect, did not bring the expected results in terms of limiting productive potential or lowering guaranteed prices (reduction of motivation to increase production). On the one hand, the applied interventionism continued to lead to intensification and growth in production, which led to growing food surpluses and a worsening of the public perception of the CAP in member states. On the other hand, the instruments of trade policy (export subsidies, variable equalisation payments), which had been criticised earlier by the international community, formed an area of negotiation in the ongoing Uruguay round of GATT (1986-1995). Expenditure from the community budget on agricultural policy also continued to increase⁵⁴. The results obtained from the Common Agricultural Policy, and the negative effects of the actions taken, necessitated far-reaching changes to the CAP instruments. The proposed changes represented the start of another stage in the process of development of the Common Agricultural Policy (1992-2000).

The turning point was the MacSharry reform of 1992. The proposed changes in the form and instruments of agricultural support were intended, among other things, to balance the supply of agricultural products with existing demand, to reduce the costs of financing intervention, to reduce prices, to improve the competitiveness of Community agriculture in world markets, to ensure that farmers received a reasonable level of income—but through market activity, not production oriented towards obtaining subsidies, to focus on meeting the high standards for environmental protection, animal welfare and food safety, in line with social expectations, and to ensure that Community agriculture functioned within the internationally imposed limitations (under the Uruguay Round) as regards rules for international trade (Poczta, Sadowski et al. 2014). The actions taken primarily involved lowering the guaranteed prices of basic agricultural products⁵⁵ (especially cereals and beef), which had an adverse effect on the level of agricultural incomes. To counteract this drop in incomes, a new instrument was introduced – direct payments (Poczta-Wajda et al. 2015). Farmers received this compensation directly from the Community budget, thus bypassing the market mechanism. The receipt of such payments was also linked to the requirement to set aside a certain amount of land or reduce herd sizes. The measure was intended

⁵⁴ In 1980-1990, total CAP expenditure (2011 constant price) doubled, from over 20 billion EUR to 40 billion EUR. At the same time, the share of CAP expenditure in total EU expenditure dropped from over 70% to above 60%. Another problem was the concentration of this expenditure, as a significant part of it went to a relatively small number of economically stronger farms.

⁵⁵ In 1992, support prices were cut for the first time. Then further cuts followed with subsequent reforms. It is worth noting that before 1992 more than 90% of all EU agricultural expenditure went towards market support and export subsidies; in 2009 that figure was down to 10% of the CAP budget (European Commission 2011c).

to reduce production while maintaining farmers' income at a constant level⁵⁶. This represented a reform of the values of the Common Agricultural Policy, away from increasing supply, towards stimulating demand and paying attention to the needs of the market. Because the payments were made directly from the EU budget, the degree of market distortion resulting from agricultural policy was expected to be lowered. There was a move away from a policy of price and market support for farmers towards one of direct subsidies. This change answered international demands for a cessation of support for agricultural producers using instruments that distorted competition and prevented imports into the Community from third countries. Alongside direct payments, structural actions were also undertaken, directed towards not only the development of agriculture, but also that of rural areas, taking into account the protection of the natural environment. This in turn was a sign of the evolution of the Common Agricultural Policy towards support for other functions of agriculture and rural areas besides food production. The changes were oriented towards not only production and income, but also social and environmental goals.

The next phase of changes, taking place in 2000-2003, was driven by the prospect of the expansion of the European Union to include countries of Central and Eastern Europe⁵⁷, and the need to improve the internal competitiveness of EU agriculture in a way that was friendly to the natural environment, as well as to continue to solve problems relating to overproduction of agricultural goods which were not externally competitive. Also important were the challenges related to reducing trade protectionism, resulting from the decisions of the GATT/WTO Uruguay Round and the ongoing negotiations in the Doha Round (Stepień, Czyżewski 2012). The basis for the changes was the Agenda 2000 document, which defined the CAP as a policy of two pillars, encompassing a common system of organisation of agricultural markets (pillar I) and a policy of rural area development (pillar II)⁵⁸. The undertaken actions

⁵⁶ Direct subsidies were intended, on the one hand, to stabilise agricultural markets by reducing motivation (price support) to increase production. On the other hand, the direct payments guaranteed the stability of agricultural incomes. It should be noted, however, that at this stage of the reform the separation of subsidies from production was only partial. Direct support was available for specific types of crop and livestock production. This meant that, although farmers were not directly motivated to intensify production, their choice of the type of crop or livestock was dependent on the support available.

⁵⁷ In 2004, the Czech Republic, Estonia, Latvia, Lithuania, Poland, Slovakia, Slovenia, Hungary became the members of the EU, and in 2007, Bulgaria and Romania. In 2004, the EU also included two countries outside Central and Eastern Europe, ie. Cyprus and Malta. The last enlargement took place in 2013, when Croatia became a member of the EU.

⁵⁸ Pillar II includes structural measures favouring the multifunctionality of agriculture and development of rural areas. The first measures of this type ("accompanying instruments") were introduced under the MacSharry reform. Agenda 2000 both strengthened the importance of the CAP's structural instruments and broadened their scope.

concentrated on improving competitiveness in the internal and external market, orienting agriculture towards food quality and safety and the natural environment, stabilising agricultural incomes, and creating alternative sources of income and employment. So the changes aimed to create a competitive agricultural sector in terms of both price competitiveness and quality criteria. Furthermore, the CAP ceased to be a typical policy focused exclusively on the development of agriculture, and became a policy more directed towards the development of rural areas.

Further support for the competitiveness of the food sector, at the same time aiming to reduce the intensiveness of production, came with the changes made to the CAP in 2003 (the Fischler/Luxembourg reform). It turned out that the system of direct (compensatory) payments only to a certain extent made farmers' decisions independent of the assumptions of the policy⁵⁹, and the procedure for obtaining subsidies was complex and costly. Moreover, the international community (the WTO) was demanding the cessation of payments linked to production (Gay, Osterburg et al. 2005). The existing system of payments was thus modified with the introduction of payments that were better decoupled from production⁶⁰. The receipt of these payments was also linked to the farmer's duty to fulfil defined "cross-compliance" standards relating to environmental protection and animal welfare. The measures adopted firstly made production decisions more independent of the type of support⁶¹, and secondly

⁵⁹ There is agreement that even decoupled direct payments do have an effect on production, although there is less agreement on how strong this effect is in practice (Matthews 2011). For example, Bhaskar and Beghin (2007) identified five major coupling channels of decoupled payments: (i) they affect the risk faced by farmers, either by reducing their level of risk aversion (wealth effects) or by reducing the risk they face (insurance effects); (ii) they ease credit constraints faced by farmers; (iii) they affect the labour allocation decisions of farm households; (iv) they alter land values, rents and land prices; and (v) they influence farmers' decisions through expectations about future payments. The decoupled payments are also generally not justified as an effective or efficient environmental instrument (Brady et al., 2009).

⁶⁰ Most existing subsidies were replaced by a single farm payment, independent of production (SPS – Single Payment Scheme). At the same time, member states were able to choose between several models for the new system of payments, including a historical, regional or mixed system. The reform was introduced prior to the 2004 expansion of the EU, and so those principles did not apply to the new member states (the EU-10, and from 2007 the EU-12). For these, a simplified system of area payments (SAPS – Single Area Payment Scheme) was implemented, supplemented by national payments and "special support". The initial size of the subsidies in the EU-12 was much lower than in the old member states, although the differences were to be reduced over time. At EU level, then, the system was non-uniform and complex. A defect of this system were the significant differences in rates between member states, particularly between the countries of the EU-12 and those of the EU-15.

⁶¹ The reform agreed upon in 2003 has been gradually implemented since 2005. In just three years, 85% of the support has been decoupled, marking a major shift of EU agricultural policy (European Commission 2011c).

meant that the funds granted could be regarded as a kind of payment for the public goods supplied by farmers to society (care for the natural environment through the fulfilment of cross-compliance standards). An importance change was the introduction of the modulation principle, namely the possibility of transferring some of the funds awarded to larger agricultural producers as direct payments (pillar I of the CAP) to the pool of funds allocated for the development of rural areas (pillar II). Moreover, a mechanism of financial discipline was introduced in the form of reductions in direct payments in case of exceeding a set limit on CAP expenditure. As regards the organisation of particular agricultural markets, changes were made relating to, among others, the markets for milk, cereals, pulses, potatoes, and renewable energy sources. Strengthening the scope and level of financing rural area development was a symptom of the continued growth in importance of the structural aspects of the CAP (Swinnen 2010a; Poczta, Sadowski et al. 2014). In the light of the challenges relating to the socioeconomic situation, in 2008 the so-called Health Check was carried out. A review was made of the assumptions, goals and instruments of the Common Agricultural Policy, in order to, among other things, make the system of direct subsidies more effective, align existing market support instruments with actual conditions existing in the EU and worldwide, and to address challenges relating to climate change, biodiversity, bioenergy production and water resource management. Ultimately, the existing direction of the CAP reform was maintained. The need was underlined for a further decoupling of direct payments from production, for their simplification, and for subsidies to be dependent on the fulfilment of requirements relating to environmental protection, food safety and animal welfare. There was also found to be a need for a further reduction in intervention in agricultural markets and for more importance to be attached to instruments supporting the development of rural areas⁶². In the face of the growing demand for food, it was underlined that growth in agricultural production must proceed in conformance with agro-environmental requirements, which provide a guarantee of sustainability in the management of natural resources (Stępień, Czyżewski 2009).

The economic slowdown and the pressure of some EU countries to reduce the EU budget⁶³ lead to subsequent changes in the instruments of the CAP. In terms of

⁶² As a result of the Health Check agreement, the distribution of expenditure for the period 2010-2013 was expected to be 69% for producer support (direct payments), 7% for market measures (product support), and 24% for rural development. This shows that the CAP has changed its objectives while at the same time still trying to meet the farmers' needs (European Commission 2011c).

⁶³ The budget for the new financial perspective remains almost unchanged compared to the period 2007-2013. It is the first case of this kind since the programming of multi-annual budgets (i.e. Delors Package 1988-1992). At the same time the share of budget expenditures in the total GDP of EU member states is expected to fall from 1.03% in 2014 to 0.98% in 2020 (Czyżewski, Stępień.2014).

direct support, the previously existing rules for granting direct payments⁶⁴ with some modifications are maintained. In the framework of strengthening the greening of the CAP, 30% of the payments that a farmer receives to the farm area will depend on the fulfilment of specific environmental requirements. There is also the possibility of tying payments to production (up to 15% of the national envelope payments) for the sensitive sectors. Member states may also grant redistributive payment for the first hectares of farmers, to provide more targeted support to small and medium-sized farms. The mechanism of reducing direct payments for the farmers receiving the highest support was also established. Within the rural areas the development (financed from the second pillar of the CAP) of areas connected with the modernisation of the agricultural sector, the development of entrepreneurship in rural areas and environmental protection will be supported. The priorities in this scope should be accelerated transfer of knowledge and innovation, a smooth functioning of the food chain and risk management (European Commission 2013).

Throughout the stages in the evolution of the Common Agricultural Policy described above, a change in its priorities can be observed. This is reflected in the instruments applied, and in the transformation from price and market intervention to direct support for agricultural producers' incomes and the provision of public goods. These changes can be expected to lead to less distortion of the market, and of prices in particular. The effects of the changing Common Agricultural Policy should be visible not only in the way in which it influences agricultural producers, but also in the effect it has on food consumers and the level of budgetary expenditure. The changes taking place may be made apparent and evaluated by means of synthetic indicators used in the assessment of agricultural policy.

Indicators of the level of support for producers

In view of the different methods used to support both agricultural producers (across countries and particular agricultural markets over the years) and food consumers, the quantification and comparative analysis of this support has been and remains a challenge for researchers. For many years agricultural policy was evaluated using a set of indicators of support for agricultural producers and consumers developed by the OECD⁶⁵. Published statistical data related primarily to the member countries of

⁶⁴ This means that the two systems continue to function, i.e. the SPS (in the EU-15 plus Malta and Slovenia) and the SAPS (other countries). The proposed common system (BPS) for all member states was not implemented (Czyżewski, Stepień 2014).

⁶⁵ Details of the methodology for calculating these indicators can be found in e.g. OECD (2015).

the OECD⁶⁶, while for the countries of the European Union such data are available only in aggregate form, for the grouping as a whole. That database therefore has limited usefulness in comparing the level of support resulting from the Common Agricultural Policy in EU member states. Although these countries are subject to a common policy, the support given to agricultural producers in different countries is not uniform. An assessment of these differences, and of the level of support for agriculture as influenced by the evolution of the Common Agricultural Policy, is made possible by the World Bank's DAI (Distortions to Agricultural Incentives) database⁶⁷. For the purposes of the present research, four measures were analysed:

- nominal rate of assistance (NRA);
- nominal rate of assistance considering decoupled payments (NRA_D);
- gross subsidy equivalent (GSE);
- consumer tax equivalent (CTE).

The nominal rate of assistance (NRA) determines by what percentage the prices obtained by an agricultural producer differ from world market prices⁶⁸. This index is calculated both for individual products and for the whole agricultural sector. In the present study, use was made primarily of NRA values aggregated for the whole agricultural sector of particular countries, calculated as an average weighted by the contribution of particular products to the total value of a country's agricultural output measured in world prices. The analysed NRA values for the sector also include the estimated level of support for the part of production not covered by the research, and support provided for the sector in general, not linked to specific agricultural production. The research also used a sectoral indicator of nominal support taking account of decoupled payments (NRA_D), which unlike the previous indicator also takes account of direct payments to farmers not related to production. The analysis also includes, to a limited extent, NRA values for particular agricultural

⁶⁶ Non-OECD countries covered are Brazil, Columbia, China, Indonesia, Kazakhstan, Russia, South Africa and Ukraine.

⁶⁷ The current DAI database contains a group of indicators of support for agricultural producers and consumers for 82 countries. These were calculated for more than 70 products, selected so that for each country the computed indicators of support would cover at least 70% of agricultural production. The database covers the years 1955-2011. A detailed methodology for the calculation of the indicators can be found in e.g. Anderson, Valenzuela (2008), Anderson (2009), Anderson, Nelgen (2013), also available on the World Bank website: <http://econ.worldbank.org/external/default/main?pagePK=64214825&piPK=64214943&theSitePK=469382&contentMDK=21960058> (1.01.2016).

⁶⁸ In other words, this indicator shows the level of distortion of prices of agricultural products caused by an interventionist agricultural policy. It should be noted that such a policy may involve both support for agricultural producers (found chiefly in developed countries) and taxation of those producers (especially in developing countries). These result in positive and negative NRA values respectively.

products, namely beef, milk and wheat⁶⁹. Also used are a measure of gross support to agricultural producers (gross subsidy equivalent, GSE) for the whole sector, which determines the money value (in US dollars) of the transfer to agriculture; and the consumer tax equivalent (CTE), which indicates the difference between the price paid by consumers and the world price.

The analysis covers all EU member states except for Croatia⁷⁰. Its maximum time range covers the years 1956-2011, although data for this whole period are not available for certain countries and measures. An analysis was therefore made based on the maximum period, but differentiated for particular (groups of) countries depending on the availability of data. Secondly, to make the analysis uniform in terms of time for all of the analysed EU countries, in some cases the period analysed was restricted to 2000-2011. All changes in the timeframe will be noted in the text.

The study involved the use of a descriptive method as well as a comparative analysis of selected areas of support for agriculture based on selected indicators of assistance given to agricultural producers. Annual data relating to the aforementioned measures were used. Calculations were made for the entire period for which data were available (variable depending on the country and group of countries) and for a uniform period for all countries (2005-2011⁷¹). The results are presented in the form of tables and graphs.

Nominal assistance to agriculture in EU countries

The values of the nominal rate of assistance to agriculture in EU countries show that over the whole period under analysis EU agricultural producers were beneficiaries of the agricultural policy (positive NRA values; Fig. 2.4.), which means that the prices that they received on domestic markets were higher than those that they would have received without this assistance.

From the signing of the Rome Treaties up to 1962 (when the CAP was launched) there was a rapid rise in the nominal assistance given to agricultural producers, from around 30% to more than 80%. The countries that made up the EEC⁷² increased their

⁶⁹ Besides the content of the text, Appendix 1 contains a table of support for a group of agricultural products for all member states (except Croatia). In view of the availability of data, this table is not uniform and relates to variable time periods.

⁷⁰ The study does not include Croatia, which joined the EU in 2013. The upper time limit for the availability of data is 2011. Belgium and Luxembourg were analysed jointly as a single unit (denoted Bel-Lux).

⁷¹ In the case of Romania and Bulgaria, for 2007-2011.

⁷² The six original European Economic Community (EEC) countries are Belgium, France, Germany, Italy, Luxembourg, and the Netherlands. The EEC was then incorporated and renamed as the European Community (EC), and in 1993, the European Union (EU). For the two members Belgium and Luxembourg the data are unified and available from 1986.

protection (increase of NRA and GSE, Fig. 2.4. and 2.6.). This was a result of the creation and implementation of a system of organising agricultural markets based on price and market intervention. Until the end of the 1960s the NRA remained high and relatively stable. During this time, as mentioned earlier, the applied support mechanisms led to increased production and efficiency, but also caused significant distortions of the world prices of agricultural products⁷³.

The CAP was also a major problem for the negotiations connected with the first enlargement of the EU, which took place in 1973⁷⁴. Although the EU prices for most farm products were significantly higher than in the new member states, the additional distortions due to the CAP were relatively small over the first two years of the EC-9 (Josling 2008b). The global crisis of the 1970s, and the related increase in the world prices of agricultural products, led to a temporary reduction in nominal assistance to agriculture (in 1974 the NRA fell to a similar level to that of 1960). So the high world prices in 1973-75 for many commodities masked the full impact of the price increases, which was expected as an effect of the accession.

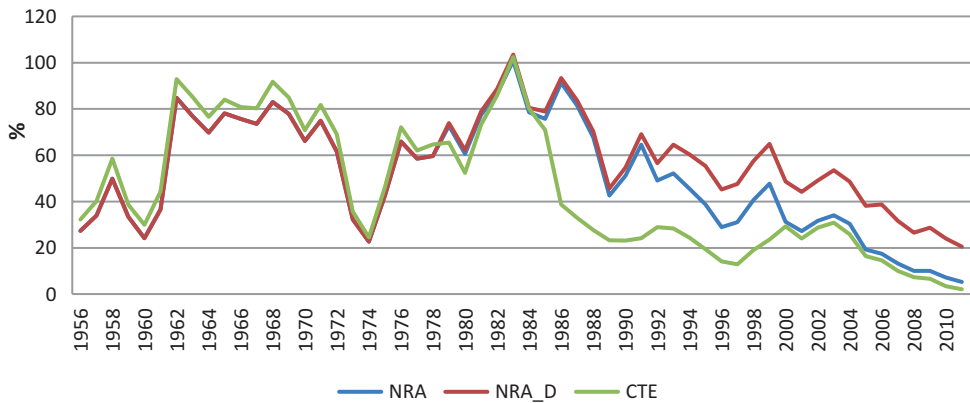


Figure 2.4. Nominal rate of assistance (NRA, NRA_D) to agriculture in the EU in 1956-2011 (%)

Source: based on figures from the World Bank's Distortions to Agricultural Incentives database (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

⁷³ That also explained the complaints from overseas suppliers about the protectionist nature of the emerging CAP. It was the period when the Kennedy Round of GATT negotiations took place (1963-1968). The talks were mainly focused on a reduction of the protectionist tendencies of the CAP. In this they were largely unsuccessful.

⁷⁴ Denmark, Ireland and the United Kingdom joined the Community. For Denmark and Ireland, the perspective of diversifying their exports to the Continental market was a positive outlook. But the UK wanted to protect as much as possible the preferential access of its former Dominions and colonies (Josling 2008a).

The macroeconomic instability after the first “oil shock” influenced the policy prices set under CAP. Because farm input costs rose sharply and the real value of price support declined, policy makers responded by increasing agricultural prices to keep up with costs. During subsequent years there was a consistent growth in the NRA, from about 40% in 1975 to almost over 80% in 1983. The gross support to agricultural producers increased also in all nine member states (Fig. 2.4. and 2.6.). In 1981 the EC welcomed Greece, after political freedom was re-established. Five years later (1986) Spain and Portugal joined the EC. Both countries had moved from dictatorships to democracies in the mid 1970s, and their agriculture needed mainly structural changes. Overall support levels were very low for the applicant countries, so the transition period for producers in the EC-9 was needed to gear up for competition from Spain and Portugal (Josling 2009). So for countries of Southern Europe the membership in the EU meant an increase of agricultural support (NRA, GSE, Fig. 2.6.).

The subsequent fall in NRA values came in a period which witnessed growth in world prices (end of the 1980s) and the introduction of the first instruments aimed at reducing production, such as milk quotas. As was mentioned above, by the mid 1980s the CAP had become an important topic of concern in the multilateral system. It came under criticism abroad (because of the high level of protection, increasing surpluses, and major cause of low world prices) and at home (because of high support costs and high consumer price). Although the EU in the Uruguay Round was defensive, the CAP was forced to adjust its policy (MacSharry reform of 1992) to the final Agreement on Agriculture⁷⁵. Moreover, there was a reduction in the amount of production for which price support was guaranteed, in order to reduce expenditure from the EU budget on the agricultural sector (this is partly reflected in the fall in the GSE values; Fig. 2.6.). The 1992 CAP reforms marked a change in instrumentalities as well as price levels. So after the NRA peaking at close to 100% in 1986, when world prices were at historical lows, this indicator generally declined thereafter (Fig. 2.5.). By 1994 the NRA for the EU was down to 40%. In 1995 three countries (Austria, Finland and Sweden) became member of the European Union. Their accession went smoothly, mainly because of the fact that they were able to pay for schemes that temporarily sheltered the northern farmers⁷⁶. And they did not use their membership to press for higher agricultural prices at the EU level.

⁷⁵ The EU was obliged to reduce tariffs, to remove the variable levy and convert them into a fixed tariff, and reduce agricultural support.

⁷⁶ In 1985-1994 Finland had the highest agricultural support among other countries applying for membership. In the case of Austria, protection levels increased in the five years up to its membership. Sweden maintained a policy much like the other Nordic countries until the late 1980s. Suffering from overproduction, Sweden abolished agricultural support and export refunds in 1990. Direct payments in compensation were paid, and an early retirement

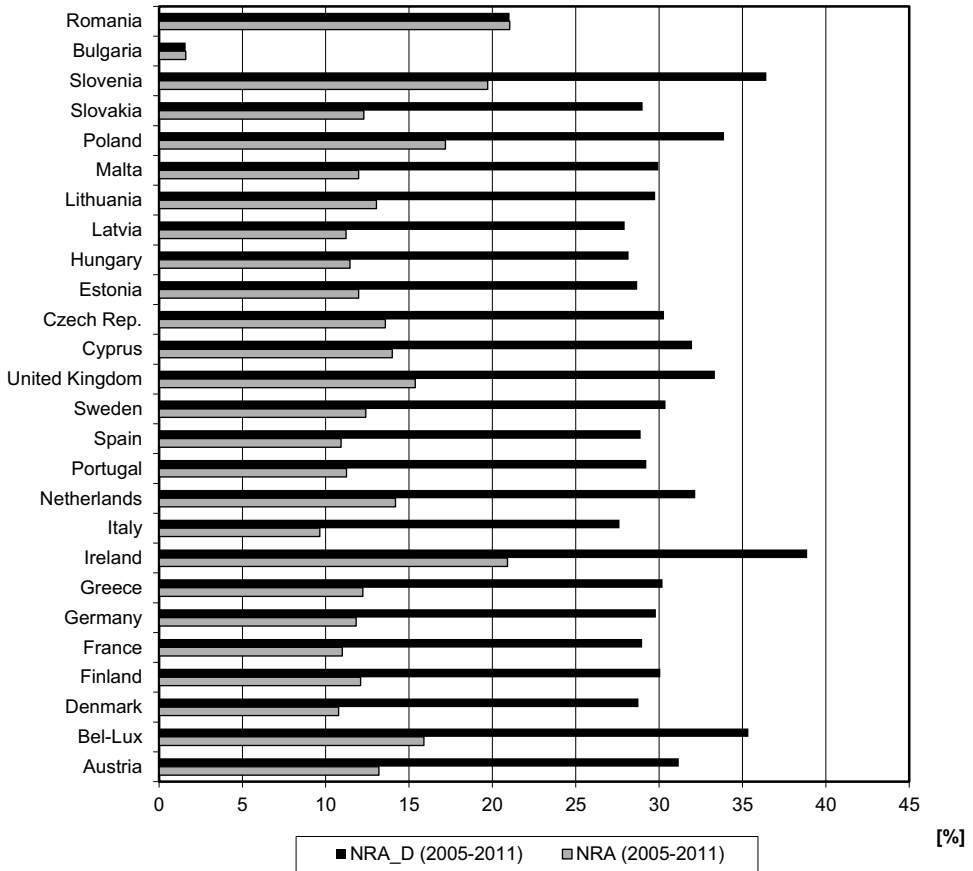


Figure 2.5. Nominal assistance to agriculture in EU countries in 2005-2011 (%)*

* The countries are shown on the graph with the “old” 15 members at the bottom, followed by the 10 which joined in 2004, and then the two which joined in 2007

Source: based on figures from the World Bank’s Distortions to Agricultural Incentives database (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

As a result of the following successive CAP reforms (Agenda 2000, and the Fischler reform of 2003), there has been a continued decline in NRA values. The main directions of these reforms were to continue reducing the support prices and substituting direct payment tied by a “cross-compliance” obligation to environmental goals. Because support for farmers was supplemented by decoupled payments, the values of the indicator NRA_D were steadily growing (Fig. 2 and 4). So it can be said

scheme for farmers was introduced (Smędzik-Ambroży 2013). The export subsidies were reinstated when Sweden joined the EU, and prices rose somewhat as a result (Rabinowicz 2003, Josling 2008b).

that from 1992 the total support (including mainly direct payments) and the market price support (limited to price support for individual commodities) began to diverge. The last enlargements of the EU (2004, 2007 and 2013) did not change the tendency of the NRA and NRA_D as mentioned above (Fig. 2.5.). It should also be noted that, over the entire analysed period, the indicator of taxation of food consumers took positive values (Fig. 2.5.). The similar values for the CTE⁷⁷ and NRA indicators up to the mid 1980s indicate that average prices for producers and consumers were distorted in the same scope, and the positive value of assistance resulted chiefly from the effects of trade policy instruments. In subsequent years the NRA was higher than the CTE, signifying that agricultural producers obtained support from instruments of internal policy (compensatory payments), but still linked to production (the CAP reforms of the 1980s and the MacSharry reform). A comparison of CTE and NRA values after the year 2000 shows that the prices received by farmers and those paid by consumers are determined by EU trade policy. Agricultural producers are nonetheless supported by decoupled instruments (NRA_D higher than NRA), in line with the further phases of CAP changes as previously described. The fall in CTE values can also be linked to the gradual liberalisation of trade. Reduction of customs tariffs and other instruments of trade policy (resulting from the GATT Uruguay Round) brought prices in the EU closer to world prices. At the same time, however, the fall in NRA and NRA_D values was relatively small, indicating that agricultural producers began to be supported by instruments of internal agricultural policy.

Based on the values of nominal assistance to EU agricultural producers as described above, it can be concluded that, after an initial period of growth, for the past two decades the value of that assistance has been consistently declining. In the last period of analysis it is even lower than (when measured by the NRA) or comparable to (when measured by the NRA_D) the values from years prior to the introduction of the common organisation of agricultural markets (1962). This is because the changes made over the years to the priorities of the CAP and the instruments used have reduced the political rent paid to EU farmers; moreover its level varies between member states (Fig. 2.6.).

⁷⁷ It should also be stated that the CTE values vary considerably across countries when expressed on a per capita basis (Josling 2009).

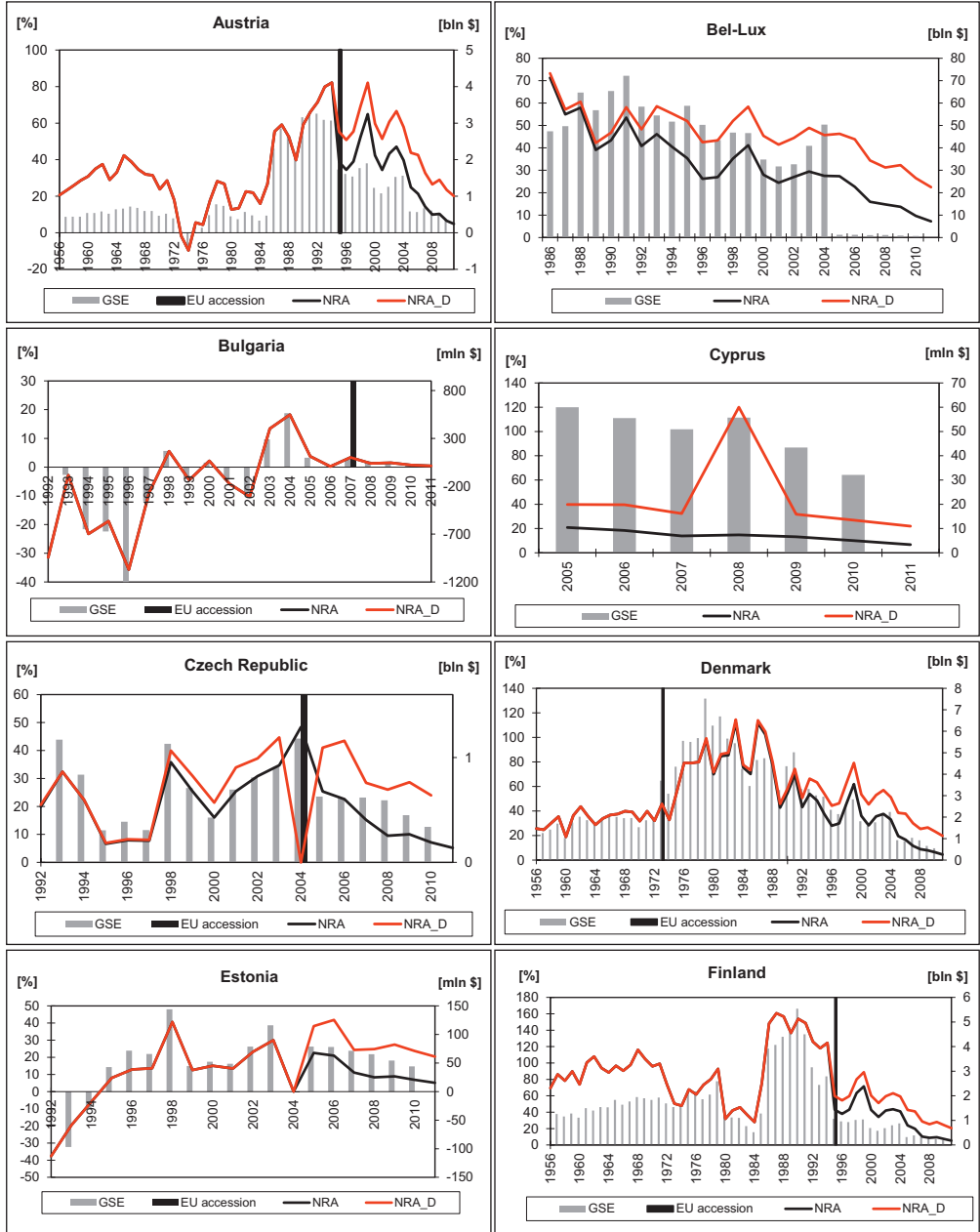


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Figure 2.6. cont.

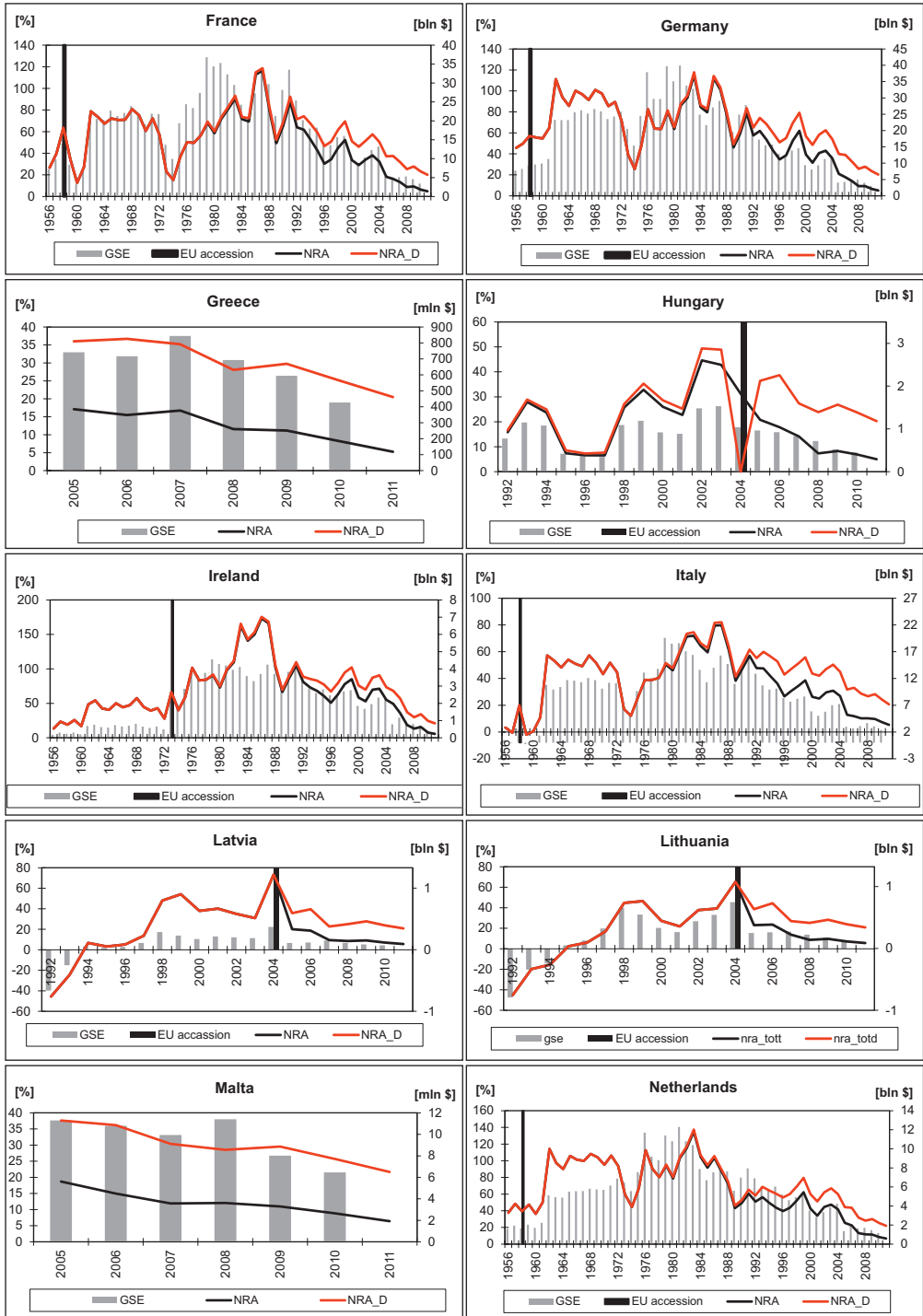


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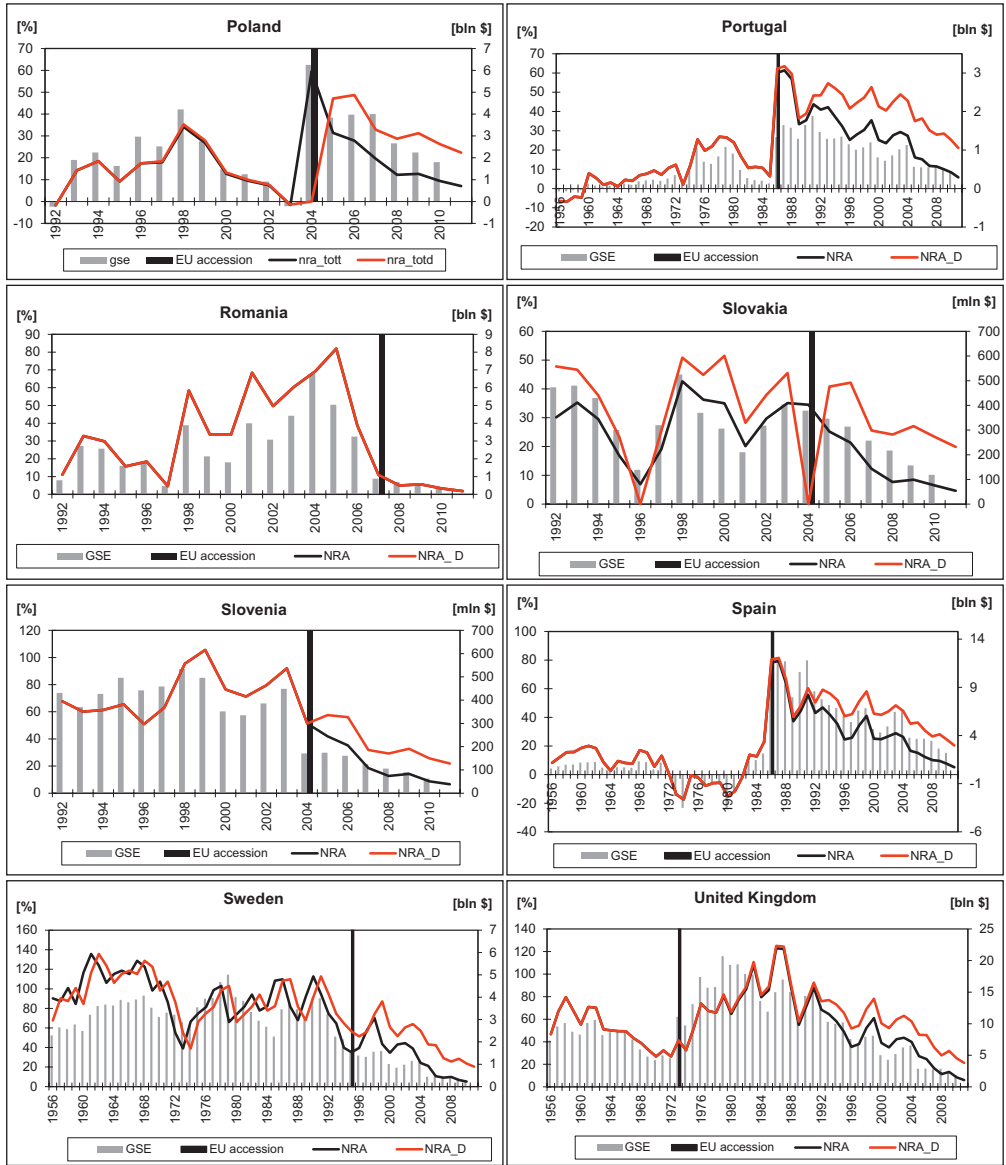


Figure 2.6. Gross support (GSSE, constant 2000 US\$) and nominal support (NRA, NRA_D, %) to agricultural producers in EU countries

Source: based on figures from the World Bank's Distortions to Agricultural Incentives database (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

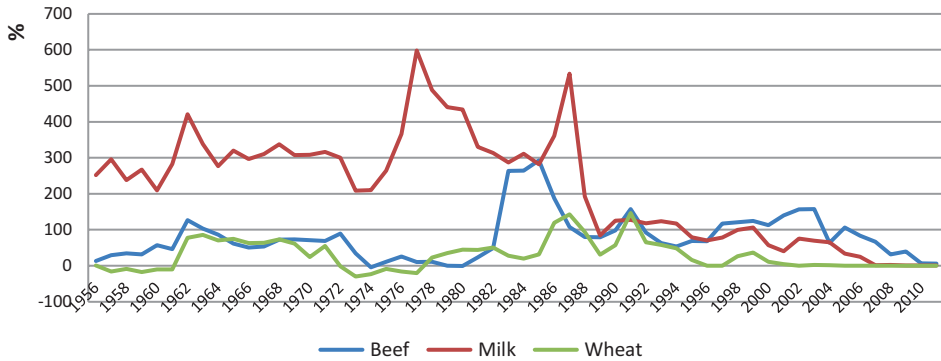


Figure 2.7. Nominal support (NRA, %) to EU producers of beef, milk and wheat in 1956-2011
 Source: based on figures from the World Bank's Distortions to Agricultural Incentives database (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

The existence of a Common Agricultural Policy does not mean, of course, that the level of support for agriculture is the same in all EU countries (Figs. 2.5. and 2.6.). This level is dependent on, among other things, the structure of production and the time of accession to the EU. In 2005-2011, among the “old” member states, the highest average level of support (measured by the NRA and NRA_D) was recorded in Ireland, Belgium, the UK, the Netherlands and Austria. Among the EU-12, the highest levels were found in Romania, Slovenia and Poland⁷⁸. In turn, the lowest levels of support for the agricultural sector were noted in Italy and Bulgaria. In the case of Bulgaria, however, although the NRA is relatively low, EU membership brought about a shift from net taxation of the country's agricultural sector (negative NRA; Fig. 2.6.) to net support. Negative assistance for agriculture was also recorded in such countries as Estonia, Poland, Lithuania and Latvia. In 2005-2011 the average levels of nominal assistance in the EU-15 and EU-12 were similar, which may contradict the thesis of variation in support for agriculture (at the sectoral level) in the “old” (higher support) and “new” (lower support) European Union members.

Variation in the support given to agriculture in the EU is found not only between countries (Figs. 2.5. and 2.6.) but also between agricultural markets (Fig. 2.7.). The scope of this differentiated support and its development over time are determined by the nature of the support instruments applied in particular markets. In the case

⁷⁸ Taking into account the Eastern European countries, it should be stated that at the beginning in the early 1990s on average support to agriculture fell to a very low level. In some countries the support increased during the mid 1990s. For these countries the pre-accession period and accession was a chance to support domestic agriculture. The accession of the CEE countries to the EU increased their levels of farm assistance, although they now face more competition within the enlarged EU (Anderson, Swinnen 2009).

of the beef, milk and wheat markets, it is seen that until the early 1990s the highest level of nominal assistance was given to producers of milk (Fig. 2.7.). Because of the system of intervention applied in the milk market,⁷⁹ in 1977 the prices received by producers of milk were six times higher than they would have been without that support. Following the introduction of milk quotas in 1984 there was an increase in nominal assistance, but from 1987 onwards NRA values for the EU milk market began to fall. In the case of cereals, in 1962-1992, in conditions of positive nominal assistance, noticeable falls in the NRA came at times of falling world grain prices. The consistent fall in the NRA for wheat since the early 1990s is linked to the gradual elimination of support in that market and its increasing subjection to international competition. The highest NRA values for the beef market were recorded in the first half of the 1980s; in subsequent years the level of nominal assistance consistently declined. This analysis of NRA values for the beef, milk and wheat markets shows that they vary in line with successive CAP reforms and the move away from types of support that distort prices, but are also affected by external factors influencing agricultural activity in EU countries. The low values of nominal assistance for the selected markets observed in the final years of the analysed period do not exclude the application of other instruments of agricultural policy supporting agricultural producers and affecting their international competitiveness.

Conclusions

The following conclusions can be drawn from the analysis based on indicators of nominal assistance to agriculture:

- Until the mid 1980s the level of support for agriculture in the EU (measured by the NRA) systematically increased. The fall in support recorded in subsequent years was maintained by decoupled payments, as reflected in the NRA_D indicator and the equalisation of CTE and NRA values. This pattern is consistent with the evolution of the Common Agricultural Policy, embodied in the changes of its priorities and instruments used. It also implies a decline in the political rents obtained by EU farmers.
- The NRA values show that nominal assistance in 2011 was at a level comparable to that recorded prior to the implementation of the organisation of agricultural markets; that is, before 1962. This means that the degree to which the CAP distorts world prices and consequently destabilises world agricultural markets is now decreasing. Moreover, EU agricultural producers are losing (although to differing degrees) the relative competitive advantages which resulted from CAP intervention.

⁷⁹ Further see Witzke at al. 2009.

- The level of nominal assistance to agriculture differs between EU countries. In 2005-2011 it was the highest in Ireland, Slovenia, Poland, Belgium and the UK, and the lowest in Italy and Bulgaria. The values of nominal assistance relating to the entire agricultural sector of particular countries do not indicate any evident division in obtaining political rent from the CAP by farmers from the old and new member states. This is also a manifestation of the equalisation of the prices recorded in the various member states.
- Nominal assistance to agriculture in the EU also varies between particular agricultural markets. Among the markets selected for analysis, the highest nominal assistance up to the early 1990s went to milk producers. From the mid 1980s (for the beef market) and the early 1990s (for the milk and wheat markets) there was a marked decline in NRA values. The pattern of NRA values for the analysed markets reflects the changes in the instruments applied under the CAP, involving a move away from price support, which causes distortion of prices, in favour of direct subsidisation.

2.4. Disproportions in the system of support for agriculture in EU countries: an attempt at estimation

(Piotr Kutyk⁸⁰, Bazyli Czyżewski⁸¹)

Introduction

The use of a variety of forms of financial support for agriculture, although a widespread practice, gives rise to many questions concerning the effects of such measures. However, regardless of the question of the appropriateness of such actions, still more doubts relate to the mechanism of economic interference itself. A dilemma arises, significant for both economic theory and practice, as to whether the huge variety of applied measures can be represented by a single model, or at least by several, describing the determinants of choice of specific detailed measures and the amount of economic surplus transferred to agriculture. In attempting to explain the mechanisms of financial support, researchers refer to macroeconomic conditions, the significance of public and merit goods, the role of interest groups, and the importance of the supply side in agriculture or related sectors. Consequently, the research carried out in this area requires reference to a broad range of factors of an economic, social, political or cultural nature. This requires that a differentiated research perspective be adopted. In an attempt to clear up at least some of the aforementioned issues, the goal of the present chapter is to estimate the scale of the disproportions in the financial flows resulting from support for agriculture between economic entities in selected EU countries. Our considerations therefore concern the market encompassed by the Common Agricultural Policy (CAP). Differences in the production structures in agriculture, and in the support instruments applied, suggest the hypothesis that the level of financial support, relative to the value of agricultural production, is not uniform among countries.

Methodology for measuring financial support to agriculture

An analysis was made of systems of financial support for agriculture in fourteen EU countries: Belgium, the Czech Republic, Denmark, France, Spain, the Netherlands, Ireland, Germany, Poland, Portugal, Slovakia, Sweden, the UK and Italy. It was decided based on the availability of data that the study would cover the years 1995-2012. An evaluation was made based on a constructed Farm Receipts Gap Estimate (FRGE),

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adopting the same measurement assumptions as in the calculation of the Producer Support Estimate (PSE) (OECD 2010). This shows by how much a farm's revenue, calculated in terms of producer prices (I_s), is higher as a result of the applied measures than it would be without any system of support (I_o). A change in the proportion may thus be an effect of both an increase in the revenue earned by the farms themselves (due to the initiation of development processes, for example) and the regulation of budget transfers. The indicator is constructed to take account of the following elements: price support, production payments, area and livestock subsidies, investment subsidies, payments limiting the employment of current means of production, income support payments, and other transfers. The required number of markets for agricultural products was determined based on a calculation of their percentage contribution to the total agricultural production in a given country. The following markets were taken into account: durum wheat, soft wheat and spelt, barley, oats, maize, rice, sunflower, soya, potatoes, tomatoes, sugar, wine, milk, pork, beef and veal, poultry, eggs, and mutton (the last being treated as a supplementary market, not analysed in all countries). The contributions of these agricultural markets, when averaged, amounted to no less than 70% of total agricultural production in individual years. This value was computed as the average contribution of the selected markets to total production for individual countries, weighted by the significance in the total agricultural production of the analysed countries. Next, the individual component indicators making up the Farm Receipts Gap Estimate were calculated. First, price disproportions were determined between particular national markets for agricultural products and an annual reference price adopted for particular agricultural markets (P_{oi}) based on OECD reports, separately for different years and markets (i)⁸². This is the external market price (FOB or CIF) taking account of the costs of transport and insurance of agricultural products. Next, price differences were calculated for each national agricultural market, using the average annual prices for particular agricultural products based on EUROSTAT data (European Commission 2014). These price differences were then multiplied by quantities of production, obtaining the price deviation value $(P_{li} - P_{oi}) * Q_i$. If the current price from a given national agricultural market was less than or equal to the reference value, then it was taken to be the reference value, and the deviation was zero (it was assumed that no negative price transfers occurred)⁸³. This indicator of price

⁸² Unlike in the case of the PSE, a single price was taken for all EU countries, according to the Law of One Price, and assuming that the flow of products between those countries took place without barriers and at zero cost.

⁸³ This assumes that part of the price differences results from variations in household income levels. Consequently, the continuing disproportions are a result of conscious actions by agricultural producers and their adaptation to the market situation. Only when a defined threshold is exceeded (in this case the reference price adopted for the entire EU market) can they be ascribed to existing internal barriers and constitute a producer's surplus.

transfers was transposed to total agricultural production, assuming that the average value of price support in other agricultural markets not included in the analysis was identical in percentage terms to the value calculated. The total value of price support was taken as the sum of the values for the individual agricultural markets, according to the formula:

$$W = \sum_{i=1}^n (P_{li} - P_{oi}) \times Q_i \quad (2.1)$$

At the next stage, an adjustment was made to account for the fact that the agricultural markets considered did not account for 100% of total production. It was consequently assumed that the level of price support in the other markets was the same as in those for which it had been calculated. At the next stage, the level of support was adjusted by the rise in prices of plant products designated as feed, which was a burden on the agricultural producers who used such feed in their production. This adjustment was made for the following markets: common wheat, barley, oats, maize, rape and potatoes. A determination was made of the quantity of agricultural plant production in the aforementioned markets which was used as feed. This value was then multiplied by the price difference, and the result was subtracted from the total amount of price support (*Z* coefficient). The value of the *Z* coefficient for internal transfers in agriculture was calculated by multiplying the previously determined price differences for the markets producing partly for feed. This value was found by summing the price differences ($P_{li} - P_{oi}$) for the agricultural products destined for use as feed. The differences were then multiplied by the quantity of production in particular agricultural markets used as feed, expressed in tonnes. The following markets were taken into account: common wheat, barley, oats, maize, rape and potatoes. The resulting value reduces the level of the Farm Receipts Gap Estimate for agriculture. The value of agricultural production was adjusted by the level of subsidies given directly to agricultural producers (D_i). Exchange rate values were used to determine the level of payments in countries outside the eurozone.

At the next stage, account was taken of those subsidies which cannot be unambiguously assigned to a specific type of agricultural production (*F*). These were calculated using data from the World Bank database⁸⁴. The value of coefficient *F* was divided into two parts. The first includes those payments which do not relate to production subsidies and cannot be ascribed unambiguously to a particular market for agricultural products, but are connected to various types of resources and incomes of agricultural producers. They were calculated by subtracting from the decoupled payments those payments which were previously assigned to payments directly coupled to agricultural production. The second element constituted subsidies for

⁸⁴ www.worldbank.org/agdistortions.

indirect consumption, and other payments not included in the earlier payments made to farms from the national budget. The sum of these two values gives the coefficient F . The final value of the Farm Receipts Gap Estimate was obtained by summing the component indicators and dividing by the total value of agricultural production in the country in question (Q_w), according to the following formula:

$$PGI = \frac{\left(\sum_{i=1}^n (P_{1i} - P_{0i}) \times Q_i - Z + D_i \right) + F}{Q_w} \times 100\% \quad (2.2)$$

These calculations make it possible to determine the amount of financial support transferred to agriculture. In the overall calculation, the indicator represents an attempt to estimate the amount of financial support to agriculture.

Measuring financial support – dilemmas in evaluating interventionism

The methodology described above for calculating transfers to agriculture is not free of significant defects. Nonetheless, the construction described is an attempt to reduce some of the imperfections that relate in particular to the valuation of price support. The approach based on the concept of economic surplus is criticised primarily on the grounds of the excessive restrictiveness of the assumptions adopted, and in particular (Alston, Norton, Pardey 1995, Scatasta, Wessler, Demont 2006): the assumption that conditions of perfect competition exist everywhere, and the ignoring of transaction costs resulting from changes in other markets for products or production factors when considering transformations in a given market. Other possible defects include an excessive attachment to the analysis of price effects while neglecting income elasticity, and the ignoring of transaction costs, full information and perfect allocation of markets⁸⁵. This is a partial analysis, and hence prices and production figures from other markets are treated as given data (exogenous variables)⁸⁶. Nonetheless, a change in the financial support given to agriculture in a large national market will have an influence on the equilibrium in other markets (and also on the level of price support at least, since the reference price will change). Also ignored are the positive and negative external effects, and public goods. The changes being made to the CAP are increasingly oriented towards public goods (Kulyk 2015). In this situation, transfers to agricultural producers need to be linked to an increasing degree to payments for environmental and social goods.

⁸⁵ In this situation we assume that the changes are homothetic. However, the transpositions do not demonstrate uniform elasticity, which leads to responses with different amplitudes. We then assume the homogeneity of the entities operating in particular markets.

⁸⁶ Changes in production and in the level of transfers in large markets, such as those of the USA and EU-27, will have an influence on other markets, including on the adopted reference price (P_{0i}).

Conditions of perfect competition also require the adoption of the assumption that uniform products, perfect information, full mobility of resources, absence of specific restrictions, and large numbers of buyers and sellers do in fact exist. Such assumptions are increasingly hard to maintain as a result of changes taking place, in particular the increasing degree of monopolisation of structures in processing and trade and the supply of production factors to agriculture. These processes are particularly visible in conditions of globalisation. Oligopolisation and oligopsonisation (where there is a small number of buyers relative to suppliers of agricultural products as a result of the concentration of channels of distribution) among intermediaries in many agricultural markets mean that analysing the financial support given to agriculture based on models of perfectly competitive markets may lead to erroneous conclusions, indicating a persistent flow of economic surplus to agriculture (Myers, Sexton, Tomek 2010). In fact, under the conditions considered, some of the funds transferred to agriculture will flow out to its related structures.

Moreover, under perfect competition, the economic surplus does not appear at the level of a single firm, but is shared by the owners of scarce production factors⁸⁷. In the classical model of the producer's economic surplus, there is also an assumption of the producer's risk-neutrality. However, when producers are faced with the problem of price uncertainty and policy changes, they may reshape the whole of the distribution produced by the market mechanism. In this case, unfortunately, the classical measure of the producer's surplus does not supply a correct estimate of the well-being resulting from interventionism in agriculture or price changes (Bullock, Garcia, Shin 2005). This can be shown by many empirical examples. A somewhat extreme case is that of South Africa, where a significant variation of more than 25% in crop sizes was recorded, causing high-amplitude price changes that were hard to predict (Poulton et al. 2006). The cause is generally the low price elasticity of the supply of agricultural crops. This effect is further strengthened by the fact that the elasticity of demand for agricultural products is generally higher than in the case of supply, causing significant instability in domestic markets. Consumers incur the costs of such a policy in the form of the transfer of economic surplus, which in the first instance flows to agricultural producers. In this way they pay for their aversion to risk. External limitations naturally arise with respect to the relationship of agriculture with related sectors, related to a number of factors (Kulyk 2013): processing capacities, imperfect competition in the processing industry and in trade, administrative costs, and the implementation of measures adopted. The assumptions adopted are appropriate to a small, open economy. In this view, agriculture creates

⁸⁷ Nonetheless, disproportions in farm structures lead to different effects in various classes of farms.

homogeneous products, which are also subject to international exchange. In evaluating direct support, it is important whether it is linked to agricultural production or whether it constitutes support for the creation of public goods. In the latter case the transfer has to be interpreted in an entirely different way, and has at most an indirect effect on product prices⁸⁸. A striving to increase the supply of public goods to society leads to a fall in agricultural production and employment, but a significant part of land inputs is retained in agriculture. An increase in land-intensive techniques of production in agriculture leads to a fall in the value of the Farm Receipts Gap Estimate, although in relative (percentage) terms it shows a significant increase (Blandford et al. 2008). It is believed, however, that in current conditions the value of such support is relatively small, and may be neglected. Considering this phenomenon in the context of the methodology of the OECD, it can be noted that overall for OECD countries such transfers are estimated at less than 5% of the PSE (Tangermann 2005). Their importance is nonetheless increasing year by year (Czyżewski, Kulyk 2011).

It is especially difficult to determine the reference price. According to the findings of institutional and post-Keynesian economics, the differences arising between world prices and internal market prices cannot be explained only by the applied policy of support for agriculture, which deforms those values. The assumption that the Law of One Price holds across an entire global market would appear to be false (Ardeni 1989). Such an assumption makes calculation easier and the analysis more transparent, but neglects a number of adjustments characteristic of imperfect competition. In such conditions transfers would be expected to reach agricultural producers directly⁸⁹. In reality, as indicated above, national agricultural markets are often dominated by a small number of large buyers, either in the processing industry or in trade (Wise 2004, Poczta-Wajda 2015). In such markets the prices of agricultural products are lowered, while they are raised in the processing or trade sectors⁹⁰.

The costs incurred by consumers are affected by the size of consumption per head of population, taking account of its share in the structure of overall consumption, taxes on consumption and the levels of national and world (reference) prices. In view of the significant contribution made by the analysed countries to global production and consumption (particularly when the values of their agricultural production are

⁸⁸ Undervaluation of production due to the weaker bargaining position of agricultural producers in the distribution chain and the absence of a true market valuation of the goods supplied by agriculture causes undervaluation of agricultural labour inputs, leading to lower rates of pay for work in agriculture, as there are numerous factors preventing the transfer of labour resources to non-agricultural uses (Lerman, Schreinemachers 2005).

⁸⁹ Neglecting the administrative costs of such transfers.

⁹⁰ Also, a fall in prices of agricultural products in certain markets in conditions of globalisation does not necessarily mean positive effects of liberalisation. Explanation should also be sought in the increased bargaining power of the processing and trade sectors.

summed), there is a direct link between national and world prices, in accordance with the theory of a large open economy (although this is not part of the described methodology). The size of production, however, is of fundamental significance in view of the low price elasticity of demand. Factors maintaining a high level of national prices include, apart from those already mentioned, price discrimination, increased importance of the quality of production, and the monopolisation of certain markets (for instance, by the introduction of regional products with legally protected names).

In the structure of support for agriculture as measured by the Farm Receipts Gap Estimate, interventionism in agriculture is best represented by the payments flowing directly to farms and coupled directly to agricultural production. Nonetheless, even in this case it is necessary to take account of the costs of this transfer, which constitute income of intermediaries. It is also necessary to deduct flows relating to payments for the supply of public goods⁹¹. Price support is the area in which interpretation is most difficult, and the proposed solutions (for example, the application of average prices) also give rise to many doubts. These relate to multiple factors: state interference, the degree of market organisation, level of competition, information asymmetry, market infrastructure, level of income and importance of agricultural products, and their heterogenisation. It must consequently be assumed that they constitute a transfer from consumers, resulting both from state action and from imperfections in allocation by the market mechanism, which is also stimulated by the actions of private firms in that market. In this case the basis is taken not as the lowest price in any of the EU national markets, but as a single average price for the whole EU market. This results from the assumption of the high mobility of factors within the EU countries. The level of price support is then relatively low, compared to the case in which reference prices are broken down by the national market (as is done, for example, in calculating the PSE).

In a standard economic analysis a social well-being function is introduced, used to find the optimum point for the division of the economic surplus. If we view the results obtained alongside social preferences, we will determine the amount of well-being that should be designated for the flow of the economic surplus to agriculture, in accordance with social expectations. In considerations of financial support to agriculture a taxpayer's economic surplus is additionally introduced. The problem of social well-being is then presented in terms of optimisation of the benefits enjoyed by three social groups: consumers, agricultural producers, and the state (Lopez, Hathie 2000).

⁹¹ In this case too, however, account must be taken of the difficulties of separating public goods from private goods produced in agriculture and of correctly estimating the value of these payments.

Another important issue is information asymmetry, which leads to the inappropriate allocation of resources in agriculture. Hence the mechanisms of support require action to ensure the delivery of appropriate information to the consumer, allowing a correct valuation of agricultural products or of food products in general. Problems of asymmetry may especially concern both scale (quantities of resources allocated) and scope (the division of resources) (Chen, Collins 2014). Other elements include the educational programmes conducted for various age groups, increased controls, and the aforementioned requirements relating to the conditions of food production or mechanisms for labelling products to confirm the fulfilment of certain requirements. On the other hand, such programmes (particularly the granting of a special status to agricultural products by means of certification) often lead to the creation of closed groups which obtain above-average income not only due to a higher quality of products (which is economically justified), but also due to a reduced level of competition, which leads to an increase in the political rent obtained as a result of state regulation.

Processes of globalisation and financialisation, which lead to the oligopolisation and defragmentation of structures of supply, processing and trade relating to agriculture, have increased their importance in influencing this sector of the economy. They may impact price relations to a greater degree. There then occurs an outflow of economic surplus to other entities, which is not intended, although to some degree it is also a consequence of the measures applied in agricultural policy. In terms of the agricultural market in Austria, it is estimated that 40% of the economic surplus is unintentionally leaked from agriculture to non-agricultural sectors (Salhofer, Schmid 2004). In this situation, an evaluation of the redistribution of income only in the relation between the taxpayer and the consumer, on the one hand, and the farm on the other hand, leads to an overestimation of the size of farms' incomes. The problem of redistribution of income as a result of financial support to agriculture must therefore be viewed more broadly, taking account of the indirect effects of such a process. The flow of economic surplus to agriculture stimulates changes in the price relations of the products sold and purchased by an agricultural producer. These phenomena produce a feedback effect, resulting from the original influx of economic surplus to agriculture.

Variation in the support for agriculture in the EU – an attempted assessment

The calculation of the amounts of financial support to agriculture based on the Farm Receipts Gap Estimate revealed significant disproportions between EU countries (Table 1). The countries that were within the EU structures for the whole of

the analysed period gradually reduced the size of their financial support to agriculture. However, this process was not uniform. Relative fast reductions were observed in such countries as Sweden (51%), Germany (46.2%) and the Netherlands (44.4%), while the smallest reductions were found in Italy (8.8%), Belgium (15.4%) and Portugal (18.7%). Increases were recorded only among the countries which acceded to the EU in that period. In consequence, neglecting the countries which entered the EU structures in 2004, the disproportions between countries in the total value of support were found to decrease (the standard deviation for mean values in the years 1995-1997 was 9.1%, while the figure for 2010-2012 was just 5.4%). There is also a significant degree of variation between years, resulting primarily from changes in the size of agricultural production being the standard of reference for the calculation of support (cf. formula 2).

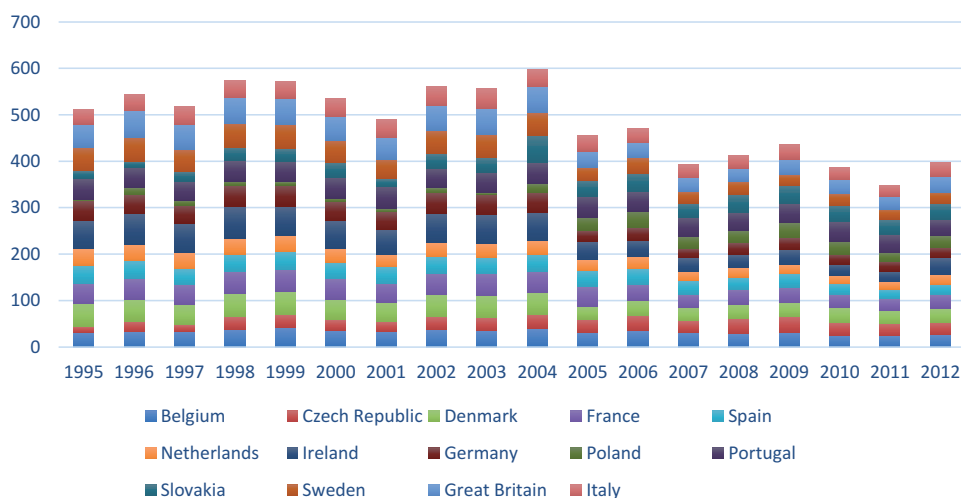


Figure 2.8. Changes in financial support to agriculture in selected EU countries

Source: as Table 2.4.

The costs of financial support to agriculture were borne by consumers to an ever smaller degree. In the clear majority of cases, the level of that support declined. Hence growth in the FRGE value was an effect of increased burdens on consumers. Agricultural policy became more and more pro-social, reducing the costs incurred by consumers: an increase in transfers from consumers means that as a result of state regulation, as well as imperfections in market allocation, they pay higher prices for agricultural products than consumers in other countries. This means that agricultural products from the area in question became more and more competitive in terms of price compared to those from other countries; this was one of the main goals of

Table 2.4. National values of the Farm Receipts Gap Estimate in 1995-2012, expressed as a percentage of total agricultural production

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belgium	31.73	33.06	34.05	38.43	41.77	36.42	34.46	38.34	36.17	40.27	31.90	35.73	32.24	28.70	32.23	25.82	24.60	26.83
Czech Rep.	13.58	22.96	14.41	26.75	27.84	22.35	20.02	26.49	27.08	30.44	28.58	32.22	24.28	32.59	33.13	26.93	26.15	27.07
Denmark	47.73	47.45	43.02	50.66	51.03	44.78	41.56	48.31	48.20	46.53	27.04	32.61	28.10	31.02	30.15	31.82	28.03	29.74
France	44.54	44.27	42.67	46.51	46.88	43.94	41.74	45.79	46.81	46.41	42.15	34.80	29.18	32.49	33.55	28.94	25.15	28.95
Spain	38.17	37.82	34.10	37.65	37.66	34.95	35.40	35.67	34.99	35.37	34.82	33.35	28.78	25.70	29.26	23.16	20.90	23.07
Netherlands	35.93	36.39	35.72	34.53	35.06	29.76	25.32	30.00	29.87	29.71	23.23	26.68	20.20	20.21	19.38	18.52	15.64	19.99
Ireland	61.01	64.80	63.16	67.67	62.36	59.82	54.09	64.01	62.43	61.69	39.53	34.57	29.17	28.60	32.55	22.95	23.33	36.96
Germany	42.45	41.23	38.68	45.23	46.31	41.44	38.47	43.52	43.75	43.50	24.37	27.26	21.10	25.50	25.03	22.20	21.27	22.84
Poland	2.99	15.25	10.35	9.96	7.17	7.60	7.21	10.84	3.37	18.27	27.81	35.58	25.02	26.29	32.12	27.89	18.45	23.84
Portugal	43.93	43.37	41.20	44.22	43.40	44.32	47.54	42.14	44.18	44.76	45.50	41.77	41.36	38.68	41.61	41.23	38.05	35.71
Slovakia	17.47	13.42	20.24	28.47	27.59	32.18	16.24	30.97	30.55	59.20	33.52	39.56	30.76	39.43	39.17	35.67	33.41	34.56
Sweden	49.71	51.73	47.55	52.28	52.13	47.35	42.37	49.73	50.83	48.68	29.35	33.24	24.68	27.37	22.86	24.97	22.08	24.35
UK	50.95	56.70	54.92	54.94	56.29	51.94	46.95	54.43	55.28	55.81	34.33	32.31	29.52	28.89	33.39	30.41	28.10	34.35
Italy	31.91	35.56	38.12	37.31	36.66	38.24	39.09	41.38	43.38	37.47	32.81	30.81	28.40	27.02	30.92	26.40	23.62	29.09

Source: calculated based on Eurostat database – Economic accounts for agriculture – values at current prices [aact_eaa01]; Anderson and Nelgen (2013), *Updated National and Global Estimates of Distortions to Agricultural Incentives, 1955 to 2011*, spreadsheet at www.worldbank.org/agdistortions, World Bank, Washington DC, June; Eurostat and Rural Development Report 2013; Eurostat and Rural Development Report 2005 (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

Table 2.5. Changes in the structure of financial support to agriculture in selected EU countries in the years 1995-2012

Country	Index of change in agricultural production	Index of change in price support	Price support as % of value of agricultural production		Index of change in price support as % of value of agricultural production	Index of change in support not assigned to agricultural production as % of value of that production	Support not assigned to agricultural production as % of the value of that production 1995-1997	Support not assigned to agricultural production as % of the value of that production 2010-2012	Index of change in support not assigned to agricultural production as % of value of agricultural production
			1995-1997	2010-2012					
Belgium	115.33	39.24	19.25	6.56	34.08	47.26	3.10	15.62	502.98
Czech Rep.	150.59	34.61	8.96	2.07	23.11	29.83	0.37	19.40	5295.55
Denmark	132.95	43.51	20.73	6.79	32.77	76.48	12.23	14.15	115.63
France	127.09	52.56	23.60	9.78	41.42	18.35	9.89	13.77	139.19
Spain	140.66	49.69	17.64	6.20	35.18	25.67	9.72	12.38	127.40
Netherlands	128.58	32.90	23.35	5.97	25.57	74.11	7.98	9.23	115.64
Ireland	122.41	30.42	35.12	8.44	24.04	3.90	10.65	15.86	148.90
Germany	127.04	20.27	22.51	3.53	15.66	2.86	10.75	15.46	143.72
Poland	195.46	92.79	7.28	3.58	49.21	660.02	0.17	14.72	8682.23
Portugal	115.31	89.59	24.35	18.92	77.72	58.64	9.74	13.28	136.42
Slovakia	130.70	181.68	8.55	11.87	138.78	150.28	3.72	16.97	455.81
Sweden	131.83	39.03	26.65	7.86	29.51	15.61	11.55	12.28	106.36
UK	121.38	42.15	27.08	9.43	34.84	0.95	11.93	17.69	148.21
Italy	119.84	72.29	20.61	12.42	60.25	17.99	8.79	10.87	123.65
<i>average</i>	<i>129.89</i>	<i>47.16</i>	<i>20.41</i>	<i>8.10</i>	<i>39.71</i>	<i>191.87</i>	<i>7.90</i>	<i>14.40</i>	<i>182.33</i>
Coefficient of variation for all countries			98.11	110.40	-	-	51.58	18.24	-
Coefficient of variation for countries joining the EU before 2004			19.18	45.01	-	-	24.98	16.97	-

Source: as Table 2.4.

agricultural policy, and will be maintained in the next financial perspective. The mechanism for reducing the costs of financial support borne by consumers involves, among other things, the institution of transfers from taxpayers to consumers. A reduction in relative prices then becomes possible, at least for some entities, thanks to various forms of subsidies to consumption. At the same time this increases demand for agricultural products, and thus increases the benefits from the scale of production in agriculture. Support for consumption also makes it possible to reduce the significance of the demand barrier in agriculture, particularly since a higher level of elasticity of demand for agricultural products is found among lower-income social groups (Urban, Michałowska 2015). The reduction in the level of price support resulted mainly from an increase in reference prices and from a reduction or even total elimination of the price gap.

Over the period as a whole, agricultural production in the countries under consideration showed constant growth (at an average level of 29.89%), despite the reduction in price support and increase in the importance of subsidies not linked directly to production (Table 2.5.), in addition to a fall in total support calculated as a percentage of production (Figure 2.8.). No relationship is found between the scale of reduction of price support and the rate of change in agricultural production itself. There was a change in the structure of support, with a marked increase in the importance of transfers from the taxpayer, and to a lesser degree those linked directly to agricultural production. The rate of growth in subsidies not coupled to agricultural production, expressed as a percentage of that production, was highest in places where a relatively low level of growth in agricultural production was recorded. In this sense it may be concluded that these subsidies represented a kind of substitute for the equalisation of lower productivity, making it possible to retain resources within agriculture. This is in accordance with the concept of sustainable development, according to which in some areas of the EU the productive function is dominant, while in others social or environmental functions are more important, which makes it possible to retain cohesion across the whole group. The system has led to a reduction in disproportions between countries, including those which functioned jointly in that structure prior to 2004. This was not a uniform process. Divergences in price support (measured by the coefficient of variation) increased from 19.18% to 45.01%, but at the same time there was a fall in disproportions in transfers not linked to agricultural production, from 24.98% to 16.97%. However, in view of the growth in the latter subsidies, the system as a whole exhibited a gradual convergence. It is thus possible to speak of an endogenous convergence resulting from the time for which countries belonged to the grouping. There were, however, still differences between countries as regards the total support and its structure.

The main beneficiaries of the support mechanism constructed in this way were large farms, often being oriented towards obtaining funds transferred to this sector of the economy (Boulangier 2010). This is consequently a factor causing additional variation in the level of financial support flowing to particular countries. If we accept that support for agriculture is supposed to provide fair incomes to farmers, then it should not lead to excessive growth in those incomes via budget transfers, but after a defined threshold is crossed any further growth in income should be the result of funds obtained through market exchange. Naturally a certain difficulty arises in connection with public goods, the supply of which is linked to the realisation of income that the market does not provide. In other cases we are dealing with an increase in the political rent.

In the mechanism of financial support to European agriculture, farmers' income is supported primarily through direct payments, with the entitlement to those transfers being linked increasingly to the fulfilment of conditions, particularly environmental ones. This is also a basic element in the European support model ensuring a reduction of the risk occurring in agricultural production, as it enables a stabilisation of income in conditions of fluctuating revenue from the sale of agricultural products. These payments are linked primarily to the resources allocated in agriculture, and in this sense this programme is much more transparent than measures supporting a mechanism of insurance or subsidies of an anti-cyclic nature (as found in the American model). In European agriculture this area is covered by the first pillar. There is also seen to be a further increase in the transparency of the system resulting from it gradually being made uniform and more transparent. In the case of the EU, actions in this regard include the convergence of rates of direct payments to farmers in different countries (significant differences still existed, but the scale of the disproportions was reduced⁹²).

As concerns the changes relating to agricultural policy in the 2014-2020 financial perspective, note should be taken of the application of degressive thresholds for direct payments and an upper limit on such payments (€300,000 annually per farm). This mechanism is intended to limit the increasing flow of payments to large entities, benefiting primarily from advantages of scale. An element linking the concept of sustainable agriculture with industrial agriculture is that EU direct subsidies are to be paid only to productively active farmers. Hence it will be agricultural production above all that is supported, which may lead to an increase in productivity. However, that growth will be checked by stricter requirements for the receipt of such payments. In an economic sense, these will constitute limits on the growth of productivity

⁹² The increase in rates applies to farmers from countries where the rates were less than 90% of the average for the whole of the EU.

in agriculture in quantitative terms. This does not therefore mean the negation of growth in agricultural production, which was one of the chief effects of the industrial model. An increase in agricultural production can even be expected, in view of the concentration of subsidies among active farmers. An additional obligation is introduced with regard to the designation of some land for ecological purposes, as well as an obligation to grow a variety of crops (ensuring biodiversity). Another differentiated element of support is the proposed one-off annual subsidy for small farms (up to €1000 annually). Naturally, in that group account must be taken of the reduction in costs linked to the fulfilment of the production requirements, but also the elimination of administration charges, which represents additional growth in income due to lower costs.

The process of environmental support is realised simultaneously via two pillars of the support system. The stimulation of innovative processes and assurance of the development of rural areas are realised primarily through the second pillar of the CAP. Rewarding innovations on farms is a factor that increases productivity, but often also the intensity of agricultural production (including through elements of precision agriculture). There is also an element of direct support for the creation of interest groups. This applies to support for the formation of producer groups. Such institutions exist to different extents among agricultural producers in various countries (such as Australia). This direction of change means an increase in transparency as regards the existence of those groups, but also an increase in the pressure that they are able to apply, leading to the possibility of them obtaining political rents. On the other hand, this makes the support process more transparent, and leads to a decrease of the asymmetry of information between decision-makers, society and agricultural producers.

Conclusions

The analysis has confirmed the hypothesis that, despite the application of an agricultural policy that is in principle uniform, the level of financial support for agricultural producers is not uniform between countries. The existing differences have slowly decreased as countries remain within the structures of the EU. It can also be noticed that these differences are an expression of the fulfilment of various functions in the economic systems of EU countries, which should not always be linked solely to the production of market goods.

An increasing convergence has been observed in the levels of financial support given to agriculture in the analysed countries, particularly since the time of the financial crisis. This applies both to the value of the support and the synchronisation

of its variation over time. This implies that it is becoming more dependent on global factors, in the conditions of financialisation of the world economy.

Significant differences were found between countries in the mechanisms shaping the structure of transfers. This applies in particular to the two main streams: transfers from taxpayers to producers, and transfers from consumers to producers. There has been a gradual change in the structure of support, away from transfers from consumers in favour of those involving taxpayers. This has resulted both from changes taking place in the global economy and the consequent growth in prices of agricultural products, as well as from transformations in the role of agriculture, and in particular the resources connected to agriculture in the economy.

The differences in the adaptations made by various countries result primarily from differences in the functions performed by the agricultural sector, and more broadly by rural areas. Hence, the relation of replaceability between transfers from taxpayers and transfers from consumers to producers has been accompanied by different adjustments depending on the scale of changes in particular countries. This has made it possible to balance various functions of agriculture across the EU, while at the same time exhibiting differences at national level.

Part 3.

National Perspective. Towards Valuing Political Rents

3.1. Flows of rents as an economic barometer for agriculture: the case of the EU-27

(Adam Majchrzak, Sebastian Stępień⁹³)

Introduction

Agriculture is a sector of the economy in which economic fluctuations are particularly marked. They are linked, on the one hand, to features of land as a production factor (Majchrzak 2015), and on the other hand, to the low price and income elasticity of demand for food products in conditions of forced consumption. These conditions of production imply an inefficient, in the Pareto sense, allocation of production factors and cause agricultural producers to be particularly strongly affected by fluctuations in their economic environment (Czyżewski 2007). In the long term, this leads to “drainage” of added value, from agriculture to the processing sector, chiefly via a price mechanism – losses in periods of downturn are insufficiently compensated by rents in periods of upturn (Zegar 2010). Although from the standpoint of the neoliberal paradigm there is no justification for treating the agricultural sector in a privileged manner – the point being, after all, to increase microeconomic rationality – such an approach ignores the external effects associated with agricultural production, both negative ones such as social stratification and environmental degradation, and positive ones related to the supply of public goods (Czyżewski, Stępień 2011). The interventionist policy and the creation of market institutions in the agribusiness sector are intended to adjust for market failures, but first it is necessary to establish the scale of those failures. A useful approach in this area may be the measurement of flows of economic rents related to fluctuations in agricultural prices, in particular the rents resulting from the flexibility of those prices (Czyżewski, Matuszczak 2017, Czyżewski 2009a).

The purpose of the present work is, in the first place, methodological. A synthetic indicator of the economic situation in agriculture is constructed based on the value of flows of economic rents in agribusiness (from and to agriculture) related to price changes in the sector and inflation. We define the economic situation as the sector’s state of economic activity. Secondly, the developed indicator is tested for all EU countries in the years 2005-2012, in order to evaluate the production decisions of farms in conditions of flexible prices of sold products. This makes it possible to verify to what extent farmers base their decisions on current price information rather than acting anticyclically, counteracting the negative effects of price fluctuation. The

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hypothesis is proposed that an outflow of economic rents in a given year implies a fall in the productive activity of farms, but with some delay. The analysis shows that the source of rent flows is primarily the variation of sale prices in conditions in which cost fluctuations balance out in the long term, and hence where costs can be treated as constant. The analysis is based on data from the FADN and the Eurostat. The time range, as noted above, covers the years 2005-2012, and the entities analysed are representative farms subject to agricultural accounting from defined economic size classes in the 27 member states of the European Union.

Economic fluctuation in agriculture – a theoretical approach

A fundamental feature of the economic cycle in agriculture, distinguishing it from other branches of the economy, is the significant fluctuation in the prices of raw agricultural products. This is particularly marked in conditions of crisis, when the prices of food goods, and consequently the incomes of farmers, decrease significantly (Sobiecki 2010) (we may note that in non-agricultural sectors, even in case of significant slowdown in GDP growth, deflation is rarely observed). If the economic situation worsens and the population's incomes fall, there is a decline in demand for food. Due to the low elasticity of agricultural production a surplus supply of goods arises, which leads to a significant price reduction. In this situation farmers reduce their volume of sales, and the fall in income leads to a decrease in consumption by the farmers and their families due to the need to cover current expenditure on production. Surplus crop production, for which there is no market demand, is used to feed farm animals, which in turn leads to an increase in livestock production and supply and a drop in prices. Agricultural prices thus fall to a greater extent than prices of industrial goods and services, leading to the "price scissors" effect, to the detriment of agriculture⁹⁴, and further to a decline in agricultural production, greater than in non-agricultural sectors. For example, in J. Popkin's analysis of cyclical fluctuations relating to various phases of a technological process, it is noted that in a period of recession the level of production of unprocessed goods fell by 15%, while production of final goods decreased only by about 10%⁹⁵.

The consequences of this process include an even greater impoverishment of farmers and a partial reduction, or diversification, of their current activity. Excess production is also utilised for self-consumption, and the funds saved in this way are used for the needs of the farm. This "adaptive servomechanism" ensures in principle

⁹⁴ Such a crisis affected Polish agriculture in the years 1928-1935. Prices of agricultural products fell by 65%, while at the same time their supply was increasing. The index of prices of agricultural products relative to prices of industrial goods fell from 0.69 in 1930 to 0.54 in 1935. Cf. (Musiał 2009).

⁹⁵ The study concerned the US economy in 1960-1975. cf. (Popkin 1984).

that farms do not go bankrupt, as they can function even while earning a “negative income”, supporting themselves through the decapitalisation of assets and non-farm income (Czyżewski 1995). This primarily applies to small-scale family farms, which are the dominant type in the conditions of European agriculture, particularly in countries like Poland, Romania, Bulgaria and Italy.

The sensitivity of the agricultural sector to economic changes caused by price fluctuations is a result of what may be called the asymmetry of disequilibrium. According to that concept, the closer one gets to the start of the technological chain, the greater the asymmetry in demand and supply, and this leads to certain consequences. In the case of agriculture, every reduction in demand (in conditions of economic crisis) for final goods (i.e. the food purchased by consumers) triggers an impulse involving a fall in orders for finished goods, then for semi-finished goods, and finally for raw agricultural products, which means that the last are susceptible to the greatest drop in prices, since their supply is inelastic. In the reverse situation, an increase in orders impacts agriculture to the greatest degree, pulling prices upwards⁹⁶, but only to a limited extent in view of the low elasticity of demand. In this case too, then, there is an asymmetry in price changes – prices of raw agricultural products rise faster than those of final goods – but at the same time there is an increase in costs of production (feed, fertilisers, plant protection products, services for agriculture, etc.), reducing the positive effects of the higher prices of agricultural products.

A negative effect of the changes in the economic situation in agriculture, brought about by the price mechanism, are the cyclic fluctuations in supply described by the so-called cobweb theorem (Ezekiel 1938). This explains the mechanism by which market equilibrium is attained subject to a given price and variable relations between the demand and supply of a given good. It is assumed that in case of certain disturbances a discrepancy may arise between the size of demand and supply. According to the originator of the concept, M. Ezekiel, the model is a useful tool for analysis if the following three conditions are satisfied (Akerman 1957):

1. Production is completely determined by the reaction of producers to price changes in conditions of pure competition. This means that a producer’s plans for future production are based on the assumption that current prices will be sustained, and that those plans will not have any impact on the market;

⁹⁶ This pattern was observed even before World War II, even though the socioeconomic and institutional environment of agriculture was entirely different then. Such results were obtained by, among others, C.L. Bean and V. Timoshenko, who found that the rapid economic growth in the United States in 1916-1919 led to a much greater rise in the prices of raw agricultural products than in the prices of industrial goods. In turn, during the depressions of 1921 and 1930-1931, agricultural prices fell more than proportionally to industrial prices. Cf. (Bean 1927, Timoshenko 1930).

2. At least one whole period must elapse between the making of the plan and the actual change in production;
3. The current price is determined by the available supply, which in turn results from the price in the preceding period.

In other words, the cobweb model is based on three assumptions, which shape the cyclic behaviour of prices and quantities. Firstly, there must be a delay between the time of the decision and the time of production. Secondly, the production plans of economic entities are based on current prices or prices from recent periods. Thirdly, current prices are chiefly a function of current supply, which in turn is conditioned by the price from the preceding period (Tomek, Robinson 2001).

The dynamic cobweb model is thus described by a delayed supply function, assuming that the whole of the production from a given period is sold (without stocks or storage), i.e. there is no delay in the demand function. This occurs when the producer is compelled, by technological considerations, to take production decisions one period before the goods are to be sold, and the sale price in period t is the price which exhausts the market, since demand must equal supply. We may note that such behaviour of agricultural producers is irrational, if all market participants act in the same way. Here, decisions concerning changes in production volumes should always provide for anticyclic actions, so as to anticipate the phases of the cycle and in that way reduce the market risk and maximise income in the long term.

Methodology for calculating a synthetic economic indicator

The methodology for calculating the value of a synthetic economic indicator first requires the computation, for farms in particular standard output (SO) classes, of the amount of income gained or lost on account of price changes relative to the previous year, based on a vector of agricultural products sold by the farm, using the following formula:

$$\Delta R_{ik} = \sum_{i=1}^n \left(\frac{Q_{itk} \cdot P_{it}}{HICP_{t(t-1=100)}} - Q_{itk} \cdot P_{it-1} \right) \quad (3.1)$$

where:

ΔR_{ik} is the change in revenue due to price differences in the period t relative to the previous year in farms in SO class k ;

Q_{itk} is the quantity of product i produced in year t on farms in SO class k ;

P_{it} is the price of product i in year t ;

P_{it-1} is the price of product i in year $t-1$;

$HICP_{t(t-1=100)}$ is the inflation rate (Harmonised Indices of Consumer Prices);

n is the number of products;

k denotes an SO class of farms;

t denotes a year.

The indicator provides information as to whether differences in the prices of products supplied by farms cause the income of those farms to be increased or decreased, and thus whether the price mechanism causes drainage of earnings away from the farm, or else reinforces those earnings.

Next, for each country, the value of the economic indicator was calculated using the following formula:

$$I_t = \sum_{k=1}^m \left(\frac{\Delta R_{tk}}{FR_{tk}} \cdot \frac{FR_{tk}}{\sum_{k=1}^m FR_{tk}} \right) \quad (3.2)$$

where:

I_t is the economic indicator for a given country in year t ;

ΔR_{tk} is the change in income due to price differences in period t relative to the previous year in farms in SO class k ;

FR_{tk} is the income in year t from a farm in SO class k ;

k denotes an SO class of farms;

k is the number of SO classes.

The indicator takes a value of zero when the price conditions in the agricultural sector are “fixed”, that is, when a farm’s income is not adjusted by the price mechanism. Positive values mean that market prices are favourable to agricultural producers, reinforcing the level of their income – the higher the value, the more favourable the situation for producers. Negative values of the parameter indicate drainage of earnings from agricultural producers, as a result of prices in agriculture and related sectors.

The next step involved the identification of groups of countries which had similar values of the economic indicator in the period under analysis. This was done using Ward’s method of cluster analysis based on Euclidean distance, which enables the grouping of objects that are most similar to each other and at the same time maximally different from others in terms of specified features (Błażejczyk-Majka, Kala 2005, Grzelak 2006, Stanisiz 2007). This procedure was carried out using the Statistica 12 package. Further analysis of the economic indicator values, also taking account of changes in income obtained from sales, was carried out on a selected group of countries, including one from each cluster.

Results and discussion

Based on the available source data, it was possible to calculate economic indicator values based on prices in European Union countries in the years 2005-2012 (cf. Table 3.1.). A cluster analysis led to the identification of five groups, as shown in the dendrogram (Fig. 3.1.) and graphs (Fig. 3.2.).

Table 3.1. Indicators of economic surplus based on prices in EU member states in 2005-2012

	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia	Finland	France
2005	-0.015	0.012	no data	0.021	-0.091	-0.039	-0.033	-0.073	-0.025
2006	0.035	0.057	no data	0.029	-0.004	0.032	-0.015	0.013	0.042
2007	0.060	-0.055	no data	-0.040	0.075	0.019	0.122	0.048	0.068
2008	-0.007	-0.023	-0.048	0.044	0.007	0.059	-0.049	0.037	0.031
2009	-0.129	-0.114	-0.221	-0.063	-0.275	-0.211	-0.285	-0.094	-0.154
2010	0.060	0.040	0.046	-0.172	0.053	0.090	0.126	0.011	0.045
2011	0.026	-0.021	0.128	0.084	0.131	0.103	0.105	0.052	0.085
2012	0.027	0.074	0.095	-0.004	-0.005	0.054	-0.001	0.015	0.033
	Greece	Spain	Nether-lands	Ireland	Lithuania	Luxembourg	Latvia	Malta	Germany
2005	-0.011	0.003	0.008	-0.020	-0.051	-0.030	-0.085	-0.073	-0.038
2006	0.021	-0.045	0.052	0.001	-0.085	0.016	0.008	-0.032	0.043
2007	0.038	0.013	0.016	0.199	0.119	0.067	0.060	0.049	0.086
2008	-0.013	-0.010	-0.023	0.012	0.016	-0.022	-0.046	0.051	0.009
2009	-0.039	-0.108	-0.111	-0.154	-0.317	-0.137	-0.050	0.005	-0.222
2010	-0.010	0.044	0.076	0.100	0.094	0.055	0.130	-0.042	0.097
2011	0.002	-0.006	0.011	0.095	0.126	0.052	0.085	0.024	0.090
2012	-0.017	0.045	0.023	0.098	-0.019	0.034	0.008	0.045	0.030
	Poland	Portugal	Romania	Slovakia	Slovenia	Sweden	UK	Hungary	Italy
2005	-0.081	-0.016	no data	-0.069	-0.051	-0.021	-0.039	-0.043	-0.077
2006	0.021	-0.074	no data	-0.028	0.030	0.013	0.019	0.053	0.026
2007	0.105	0.021	no data	0.091	0.065	0.088	0.091	0.099	0.025
2008	-0.021	0.013	0.032	0.011	0.006	0.059	0.030	-0.062	0.015
2009	-0.120	-0.058	-0.103	-0.265	-0.184	-0.147	-0.058	-0.149	-0.081
2010	0.071	0.012	0.025	0.107	0.014	0.047	0.060	0.055	0.014
2011	0.117	-0.021	0.103	0.092	0.071	0.033	0.066	0.105	0.055
2012	0.021	0.014	0.051	0.019	0.015	-0.006	0.014	0.063	0.029

Source: based on FADN and Eurostat data (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

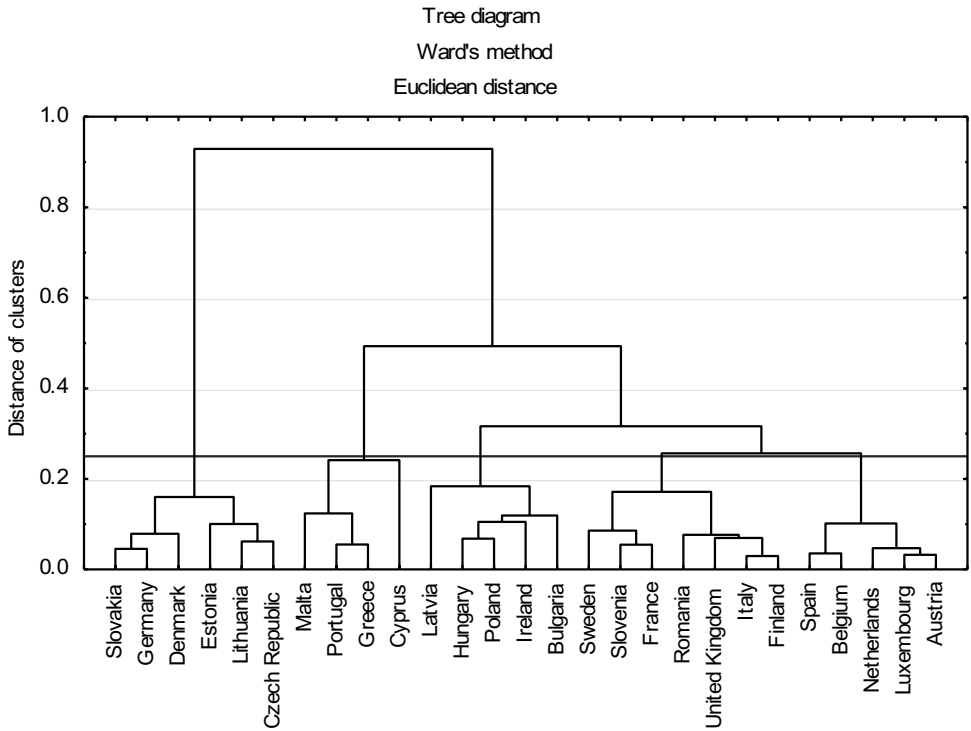


Figure 3.1. Dendrogram of the values of the indicator of economic surplus based on prices in EU member states in 2005-2012

Source: own compilation (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

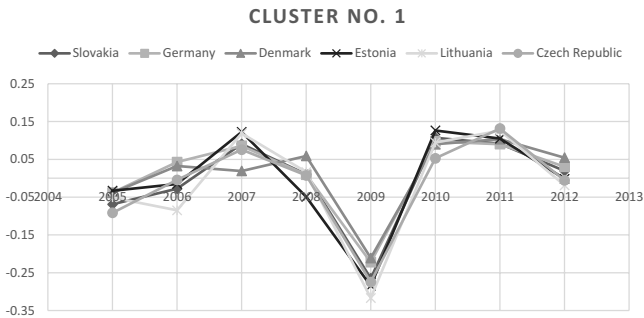


Figure 3.2. (continuation on next page)



Figure 3.2. Values of the indicator based on flows of economic rents in EU member states in 2005-2012 (by cluster)

Source: own compilation (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

Based on the obtained results it is possible to identify a full economic cycle (two consecutive maximum values of the indicator) in 2007-2011 for clusters 1, 3 and 4, in 2007-2010 for cluster 2, and in 2006-2010 for cluster 5. The observations indicate that the economic rents due to price changes can in most countries be treated as a kind of economic barometer (of economic activity in agriculture), although there are differences in the strength of reaction of farms to changes in price conditions.

Table 3.2. Annual changes in production on farms in selected EU member states in 2006-2012

	2006	2007	2008	2009	2010	2011
Germany	---	6%	-1%	-1%	16%	5%
Portugal	---	9%	4%	-15%	3%	---
Poland	---	14%	29%	-30%	14%	7%
France	---	4%	3%	-10%	12%	5%
Netherlands	15%	7%	9%	-6%	13%	---

Source: based on FADN and Eurostat data

In Germany, the year 2007 saw increased production as well as positive values of the economic indicator, resulting from the increase in prices of goods supplied by the agricultural sector relative to the preceding period. In 2008 the indicator began to fall, and the income obtained proved to be lower than in the previous year, in conditions of falling production and sales. In 2009 there was a further fall in production and in the income obtained by farms, resulting both from the level of supply and from unfavourable changes in prices. Only in 2010 (and then in 2011) did production begin to rise, accompanied by a growth in prices for raw agricultural products, as reflected by the positive value of the economic indicator. It should also be noted that in the analysed period the annual change in production and in income did not fall below -1.5%, which suggests that the decisions taken by farms were largely rational and anticyclic. The unfavourable changes produced by the price mechanism were levelled out by adjustments made at the level of individual agricultural producers. Thus, their reactions were not in accordance with the cobweb theorem as described previously.

Fluctuations in the calculated values of the economic indicator in the countries of the second cluster were significantly smaller than those observed in the other groups. Particularly noteworthy is the absence of a significant worsening in price conditions in 2009. Nevertheless, in Portugal, production and income fell in 2009 to a much greater degree than in Germany. In this situation, even following the increase in production in 2010, it remained at a level of more than 8% below that of 2007. It may be concluded that farms in that country adjust to price changes less successfully; that is, they react excessively to deteriorating price conditions. This may result from a greater fragmentation of production and the absence of appropriate institutional solutions.

The above observation is confirmed by the results obtained for Poland (cluster 3). In that country the economic indicator takes positive values in 2007, 2010 and 2011, and negative values in 2008 and 2009. The favourable price conditions of 2007 led to a marked increase in production in the following year (2008), despite the worsening price relations (negative value of the indicator). This had consequences in 2009, when apart from the significant fall in prices of raw agricultural products, their supply also decreased. As a result, real farm income fell by 30% in that year, this being the largest fall among the countries analysed. An upturn followed in 2010 due to an improvement in price conditions, which in turn contributed to strong rises in production in 2011 and 2012, despite the worsening price relations. Overall, Poland exhibited a high degree of variation in both production and income, resulting from changes in price conditions, which failed to keep up with the market. Farms' reactions in shaping the level of supply reflected the situation described in the cobweb theorem, which from the standpoint of economic efficiency does not represent rational behaviour. In these conditions, the hypothesis put forward at the outset was not confirmed, and the indicator functioned with a significant delay.

In the other two analysed countries, France and the Netherlands, annual changes in production corresponded to changes in the economic indicator, which indicates a greater flexibility on the part of producers and a better adjustment to changes in market conditions. In this case the hypothesis proposed at the outset was confirmed⁹⁷.

Conclusions

The main consequence of the changes in the economic situation in agriculture is a large variation in sale prices. This variation was confirmed by the calculated values of the proposed economic indicator. The largest fluctuations were observed among such countries as Germany, Denmark, the Czech Republic, Slovakia, Estonia and Lithuania. At the other extreme (with the smallest amplitude of fluctuation) were Portugal, Greece, Cyprus and Malta. At the same time, the calculated value of the indicator was reflected in changes in production and farm income, although this reaction was simultaneous in the case of some countries, and delayed in others. This partially confirms the hypothesis that an outflow of economic rents from agriculture implies a fall in productive activity, and vice versa⁹⁸ (in some cases, including Poland, the reaction was delayed, as described in the cobweb theorem).

⁹⁷ More about the situation of agricultural holdings in the European Union after 2004: (Grzelak 2016).

⁹⁸ In Australia, Spain, Italy and Estonia the variation in production (crops, in this case) was greater than the variation in prices. The analysis also shows that in the case of the UK, Australia and Canada, for the majority of farms (75%, 72% and 55% respectively) there was a negative correlation between price changes and the level of production. For Italy, Estonia and Spain such farms accounted for, respectively, 36%, 32% and 25% of the total. Cf. (Gimer, Kimura 2010).

It has also been shown that the relationship between the values of the economic indicator and the production of raw agricultural products differ between countries. In Germany, which belonged to the group of countries with high fluctuations of the indicator, the variability of production is relatively low. Even in the most difficult period for agriculture (2009) the fall in production there was only 1%, while in Portugal it was 15%, and in Poland as much as 30%, despite a smaller fall in the economic indicator. In the authors' view this is a result of the different agrarian structures, the scale and technology of production, and differences in the functioning of market institutions (integrative links, contracting systems), as well as the reactions of the producers themselves.

In conclusion, an analysis of changes in the economic situation based on flows of economic rents is an atypical approach, but one which helps to indicate the causes of changes in productive activity on farms, and enables a comparison of the scale of such changes between countries. This approach may be a useful analytical tool for agricultural policy, which is becoming particularly important in the conditions of increasing globalisation. Consequently, there is a need for adaptation to the mechanisms of globalisation, accompanied by the creation of instruments of coordination at supranational level. This has for many years been the objective of the European Union in creating the instruments of its Common Agricultural Policy.

3.2. Public goods in the Common Agricultural Policy of European Union countries⁹⁹

(Katarzyna Smędzik-Ambroży, Marta Guth¹⁰⁰)

Introduction

Public goods represent one of the categories of market failure. The concept of public goods refers to fundamental, generally available benefits which can be enjoyed jointly. Theoreticians differentiate public from private goods in that the latter become people's property after payment is made for them, while with the former this is not necessarily the case (Niewęglowska 2011; Cooper, Hart, Baldock 2009). These features mean that it is difficult to obtain payment for the provision of such goods, which in turn causes a lack of stimuli to provide them (Baldock, Hart, Scheele 2014). Hence, *putting* it simply, one can say that public goods are goods which are desired by society but which the market mechanism is not able to deliver. According to Paul Samuelson (1954), these goods have the following properties:

- no-one is excluded from the benefits resulting from their use (they are non-excludable);
- an increase in the number of users neither eliminates nor reduces the possibility of the use of a given good by all users (they are non-rivalrous).

The second condition is not as universally accepted as the first. Some scholars, such as Knut Wicksell and Mancur Olson, omit it entirely (Fijor 2011). An analysis by the OECD (2001) concerning the multifunctional model of agriculture has identified the production of public goods as a new function of agriculture. Consequently, interest in the subject of public goods created in agriculture has grown in recent years. Both public goods and merit goods are produced in agriculture in conjunction with the production of market goods (agricultural production) (Jakubowski 2012). The literature offers various classifications of the public goods produced in agriculture. Jakubowski (2012) lists four types of goods, distinguished by the properties of being excludable and rivalrous. In turn, Buchanan (1968) and Head (1962), the authors of a report published by the Institute for European Environmental Policy, as well as Duer (2012) distinguish three degrees of social use of goods generated by agriculture: low, medium and high (cf. Table 3.3.).

⁹⁹ This chapter includes parts of the article by B. Czyżewski and K. Smędzik-Ambroży titled *The Regional Structure of CAP Subsidies and Factor Productivity in Agriculture in the EU28* (2016).

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Table 3.3. Classification of goods based on degree of use by society

Degree of use by society			
Low	Medium		High
Private goods	Club goods	Local public goods	Global public goods
Rivalrous	Non-rivalrous for a small group of users	Non-rivalrous but with a high risk of exhaustion given an excessive number of consumers	Non-rivalrous, with a possible risk of exhaustion given an excessive number of consumers
Non-owners excluded from consumption	Limited set of users, others excluded from consumption	Others may be excluded only at high cost	No possibility of excluding others from consumption
e.g. agricultural products	e.g. private parks	e.g. regional landscape, local sources of drinking water	e.g. climate, biodiversity

Source: Cooper, Hart, Baldock (2009); Duer (2012)

Wilkin (2010) presented a simplified classification of public and merit goods in agriculture, encompassing environmental goods, which include biodiversity, agricultural landscape, soil conservation and water conditions; economic goods, including food safety and food and energy security; and socio-cultural goods, which include the economic and social vitality of the countryside, enrichment of national culture, and shaping of a local, regional and cultural identity. In different studies a distinction is made between global and local public goods. The first category includes goods that are universal for all countries, groups of people and generations. Examples are the production of oxygen and protection of biodiversity. Because these are universal goods and are equally important for all people, reward should be given for them according to a uniform system in all countries. Local public goods are goods which are consumed at a local level; examples might include the landscape and the cultural heritage of the countryside (Małażewska 2015; Brelik 2015).

In the literature (cf. Carson and Czajkowski 2014; Boyle, Welsh, and Bishop 1993; Adamowicz 1994; Cameron and Englin 1997; Breffle and Morey 2000; Ferrini and Scarpa 2007; Hanley, Kriström, and Shogren 2009; Bateman et al. 2004; Carson and Louviere 2011; Czajkowski, Hanley and LaRiviere 2014) several types of remuneration for the supply of public goods by farmers are identified, including:

- direct valuation of the supplied goods and payment for them (for example, per job created, per hectare of land where erosion has been combated, by quantity of carbon sequestered in the soil) (Maciejczak 2009);
- payment for the use of rights of ownership of resources or production factors to the extent necessary for the supply of public goods;
- payment for lost income in the case of supply of public goods relating to the environment (exclusion of means of production from profitable use);

- compensation for transaction costs or other barriers in the reallocation of resources needed to supply public goods (FAPA 2009).

It should be borne in mind that the creation of a system of remuneration for public goods will bring about additional operational costs, including, for example, the costs of incentives, consultation, communication, administration, implementation, monitoring and evaluation. The issue of remuneration for public goods in agriculture is therefore a very complex one. The development of a system will certainly require the solution of a number of significant problems. The most important of these include:

- difficulties with a precise valuation of the public goods supplied by European agriculture;
- the need to distinguish between “not harming the environment” and “supplying public goods”¹⁰¹;
- the need to develop a mechanism of coordination of demand and supply (negotiation between farmers and society);
- selection of the most appropriate mechanisms motivating farmers to supply public goods (FAPA 2009).

Increasing numbers of studies suggest that certain systems of agriculture, usually more extensive systems of livestock farming and mixed systems, systems of permanent cultivation with a large percentage of semi-wild plants, and organic systems, as well as certain agricultural practices encompassed by the concept of sustainable agriculture, support a wider range of public goods than industrial systems do. There is a wide spectrum of agricultural practices which supply public goods and the continuation of which is of key importance if those goods are to be supplied at the level required by society. The scale of the supply of public goods in agriculture is affected by many factors, of which the most important ones include appropriate land management, type of land use and intensification of land management, farm structure, including field size and scale of operations, having an effect both on the logistics of production and on the structure of the landscape, location factors – the location of the farm relative to water courses, more natural elements, groundwater resources, easily flammable forests, situation in a coherent landscape, historical factors – relics, archaeological values – and socioeconomic structure – e.g. semi-subsistence farms.

Public goods are produced in agriculture on private land, although land is a common national legacy. A part of the benefits resulting from the work of farmers is thereby transferred to third parties without any compensation to the farmer. These are

¹⁰¹ According to RISE, a level of environmental targets should be set that farmers are obliged to achieve at their own cost (e.g. cross-compliance), but society may pay the costs of attaining higher environmental standards (RISE 2009).

what are called the external effects of management (Baum, Śleszyński 2009). There must therefore be an awareness that without adequate incentives (social outlays) public goods are not and will not be produced in optimum quantities – the absence of intervention may lead to undersupply, oversupply or even a complete lack of such goods. The consequence of such a situation may be an ineffective allocation of social resources. National governments and international organisations have several ways of regulating the supply of public goods: systems of subsidies, tax mechanisms and legal regulations (RISE 2009). According to an analytical report by a thematic working group on “Public goods and the public system of intervention” dated 14 June 2010, “although the term ‘public goods’ is not officially used in the documentation setting out the justification for intervention under the regulation on rural development (Council Regulation 1698/2005) or in the Community Strategic Guidelines for Rural Development (Council Decision 2006/144/EC), many of the priorities identified as requiring action are in accordance with that idea, with payments being justified only when action goes beyond that required by law. As a result of this, although many of the means under rural development policy have the potential to deliver public goods, that is not always the basic logic behind the intervention.”.

The European Agricultural Fund for Rural Development (EAFRD) is the political support instrument with clearly the greatest potential to provide active incentive to supply public goods, through a deliberate and targeted approach. It delivers by far the greatest source of financing as an incentive to provide particular agriculture-related public goods in Europe. The degree to which it is used for the delivery of public goods is nonetheless strongly dependent on the way in which member states design their internal rural development programmes – the actions they prioritise, the eligibility criteria they apply, the way in which measures are designed and targeted, and the way in which the various systems are implemented. There is one obligatory means for the development of rural areas – the agri-environmental measure. However, in view of the extensive nature of the objectives of rural development policy, including competitiveness, environmental and social goals, and the differences in the degree to which economic, social and environmental issues are prioritised in various member states, there are large differences between the ways in which the supply of environmental and social public goods is treated in particular rural development programmes (European Network for Rural Development, 2010).

The goal of the present study was to determine whether in the EU-28 countries there are agricultural support models which differ in terms of the contribution of the payments for public goods to the total value of the political rent¹⁰². By an

¹⁰² The political rent is taken to be the sum of cash transfers (subsidies and payments) to farms in the EU under the Common Agricultural Policy (after Bezat-Jarzębowska, Rembisz 2013).

agricultural support model, the authors mean a structure for such support, reflected in the contributions of particular types of Common Agricultural Policy payments to the total political rent. In the authors' view, the significant differences across the EU-28 relating to, among other things, the supply of public goods (their type, quantities and quality) by different countries and regions of the EU (see: Matuszczak 2013; Giannakis, Bruggeman 2014) mean that it is not possible for a single agricultural support model with identical contributions accounted for by the subsidies for those goods to exist in the EU. The authors therefore propose the hypothesis that one can distinguish several agricultural support models in the EU-28, differing in terms of the contribution of the payments for public goods to the total political rent (Czyżewski, Matuszczak 2016). This hypothesis was tested based on the latest data (2012) on representative farms in each EU-FADN region.

Materials and methods

An identification was made of areas within the EU-28 having similar agricultural support models, characterised by similar contributions of the payments for public goods to the total political rent. For this purpose, an agglomerative cluster analysis was performed (using Ward's method) covering 131 representative farms for EU-FADN regions, according to the criterion of contributions to the political rent from the following grouping variables: X1 – value of subsidies for public goods, being the sum of set-aside payments, agro-environmental payments, less favoured area (LFA) payments and other rural development payments; X2 – value of subsidies for plant and animal production (the sum of other subsidies to plant and animal production including the balance of payments and penalties for milk production, subsidies for other cattle production and for sheep and goat production); X3 – value of single farm and area payments; X4 – value of subsidies for indirect consumption; and X5 – value of investment subsidies.

The disjointness of the clusters was verified by evaluating the significance of the differences between the average contributions of subsidies to the political rent. The assumption of homogeneity of variance of the variables between groups of regions was evaluated using Levene's test and the Brown–Forsythe test. The hypothesis of homogeneity of variance in comparable groups for the individual variables X1–X4 was rejected, except in the case of the variable representing the contribution of subsidies for indirect consumption. Therefore, to evaluate the significance of the differences between the averages from the samples (clusters), the non-parametric Mann-Whitney U test (Stanisz 2007) was used. It was confirmed that the clusters (identified at a level of approximately 50% of the maximum distance) differ significantly in terms of the structure of budgetary subsidies to agriculture, including

the contribution of support for public goods (aggregate X1) to the total political rent. The computations were performed using the Statistica 10 program. The analysis thus covered 131 representative farms for particular EU-FADN 28 regions in the year 2012, and concerned the contributions of particular types of payment to the political rent received by a representative farm in a given region. Due to the absence of information in the EU-FADN statistics concerning the values of subsidies to representative farms in the regions Entre Douro e Minho and Trás-os-Montes, these were excluded from the analysis. Similarly, the analysis did not include the French overseas departments.

Results

Three clusters of regions were identified, differing in terms of agricultural support models, including the contributions of support for public goods (aggregate X1) to the total political rent (cf. Table 3). In the most numerous group of regions (cluster A) a model was found in which agriculture was supported chiefly by single farm and area payments (these accounted for more than 59% of the political rent). Farms in these regions also received significant economic benefits from the provision of public goods – agro-environmental, set-aside and LFA payments and other rural development subsidies accounted for almost 17% of the political rent of representative farms in those regions. The next most numerous cluster (B) contained regions in which the contribution of public good payments to the political rent was clearly the lowest. Farms from the regions in this cluster were supported primarily by single farm and area payments (aggregate X3), which accounted for almost 80% of the political rent. Meanwhile, in the structure of agricultural support in these regions, the contribution of public good payments was clearly the lowest, at less than 9% (cf. Table 3.4.). This shows that farms from this cluster receive the least reward for the supply of public goods, which is reflected in the model of CAP support implemented in these region. Cluster B therefore featured a model in which support for production was replaced almost exclusively by direct support to farms. The reverse situation was found in the case of farms from the least numerous cluster, which contained only 24 regions from the EU-28. The model implemented here combined various support mechanisms, with payments for plant and animal production as well as single farm and area payments making a significant contribution to the political rent. At the same time, cluster C featured the highest contribution of public good payments (33%), significantly greater than the one recorded in the other clusters (cf. Table 3.4.). This shows that farms in the regions making up cluster C performed productive functions and at the same time supplied a large quantity of public goods, and consequently the agricultural support model implemented in this group of regions might be called the

most sustainable. More than the other two models, it combined the microeconomic effectiveness of farms resulting from their productive functions with current social expectations in the EU, reflected in the support given for the supply of public goods by farms. Such an agricultural support model has certainly led to a decline in the phenomenon of the “technological treadmill”¹⁰³ in the area of its implementation; hence by means of the structure of the political rent, conditions have been provided for the sustainable development of rural areas, in which a particularly important role is played by recognition of the importance of the supply of public goods by farms.

Table 3.4. Average contributions of particular types of subsidies to the political rent in 2012, by cluster (%)

CLUSTER	Number of regions	X1 ¹	X2	X3	X4	X5
A	57	16.78	8.82	59.48	1.55	3.92
B	50	8.75	3.22	79.77	2.08	1.73
C	24	32.88	17.18	27.26	2.30	9.89
Total	131	16.66	8.21	61.32	1.89	4.18

¹X1 to X5 – contributions of particular types of subsidies to the political rent, namely: X1 – contribution of subsidies for public goods; X2 – contribution of subsidies for plant and animal production; X3 – contribution of single farm and area payments; X4 – contribution of subsidies for indirect consumption; X5 – contribution of investment subsidies (see methodology)

Source: elaborated by the authors, based on EU-FADN data (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

The geographical distribution of the differentiated agricultural support models in the EU-28 is shown in Fig. 3.3. Over most of the area of the EU in 2012 a model was implemented in which support for agricultural production was replaced by single area and farm payments and support for public goods (model A or C; see Fig. 3.3.). This is in line with the desired direction of evolution of the European agricultural model towards sustainable agriculture, this being most strongly supported in model C (which features the largest contribution from payments for the provision of public goods).

¹⁰³ The technological treadmill involves the following sequence of events: increase in production (supply) above demand → fall in prices → change of technology to increase production and reduce unit costs → increase in supply → fall in prices, etc. (Kuś 2012). Tangible capital investment thus becomes essential for retaining a specified level of effectiveness of agricultural production, which becomes a direct cause of the cumulative increase in the intensiveness of agriculture.

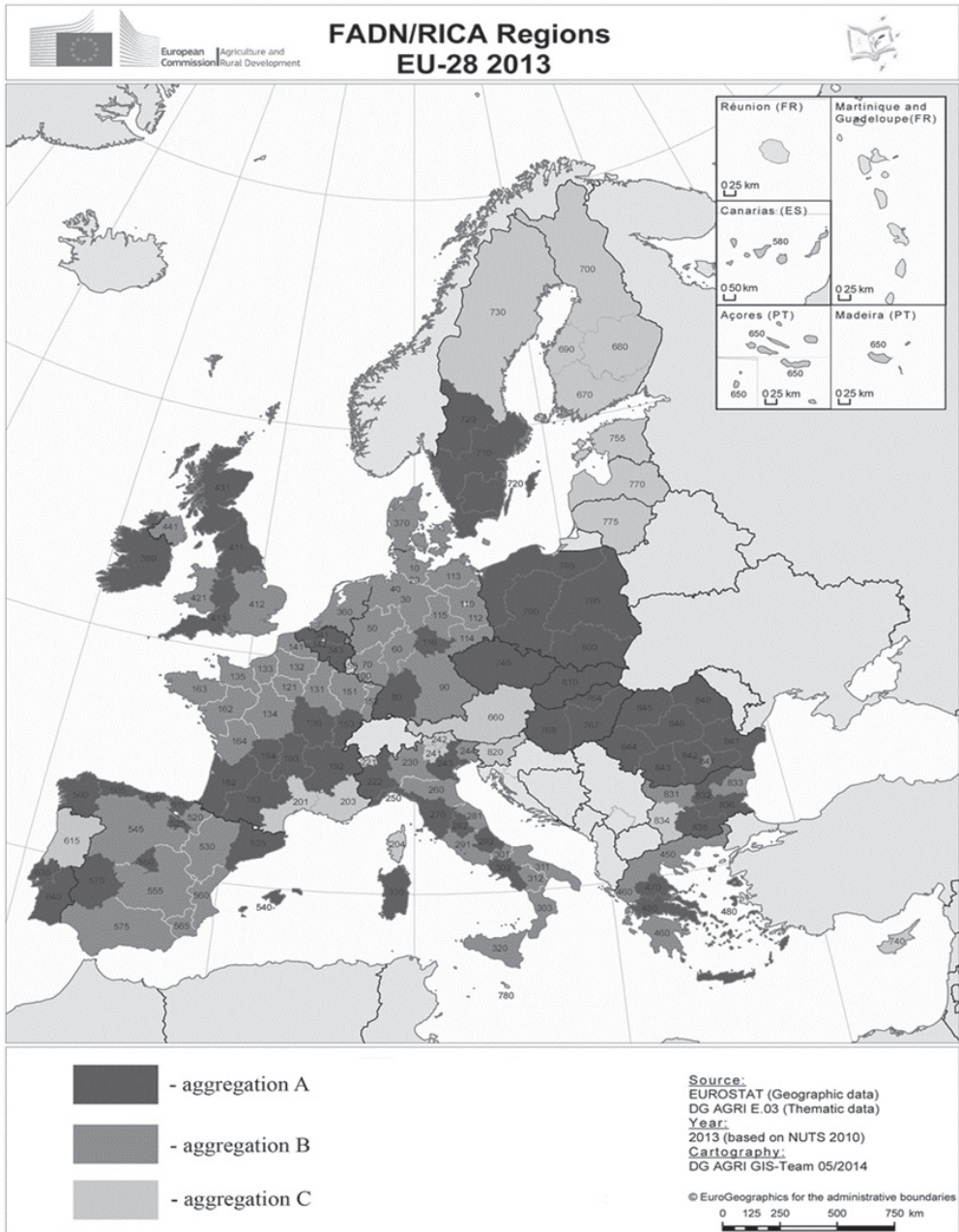


Figure 3.3. Clusters of EU-28 regions in 2012 according to structure of FADN subsidies

Source: by the authors, based on EU-FADN data (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

In most of the regions of the “old” EU member states, however, the model implemented in 2012 was model B, oriented exclusively towards direct payments, which are treated as a substitute for support for production, and create relatively weak stimuli for sustainable development, whereas in the countries of Central and Eastern Europe model A was dominant, which provides an opportunity for the valuation of the public goods supplied by agriculture. This is also confirmed by analyses by other authors, who have noted, among other things, that direct support goes primarily to farms from areas of intensive agriculture (see: Kutkowska, Berbeko 2012; Giannakis, Bruggeman 2015). In a small group of regions a highly sustainable model was found, combining different forms of support for farms (cluster C). Subsidisation for the provision of public goods was found here alongside the maintenance of high subsidies for agricultural production and significant direct support (uniform payments). This group included most of the island regions of the EU, and the northern part of Europe, consisting of the regions of Finland, the Swedish region of Lan and Nora, and the regions of Lithuania, Latvia and Estonia. This cluster also included a few regions of Southern and Central Europe, mainly mountainous regions (see Fig. 3.3.).

To recap, the groups of the EU-28 regions identified by the cluster analysis have been found to differ significantly in terms of the structure of budgetary subsidies for agriculture, but only models A and C were to a greater or lesser extent in line with the development priorities of the European agricultural model accentuated in the new programming period of 2014-2020. This was confirmed by the significant support given in these agricultural support models for the supply of public goods. Therefore, the results of the analysis make it possible to accept the hypothesis that several agricultural support models can be distinguished in the EU-28, differing in terms of the contribution of public good payments to the total political rent.

Conclusions

The reforms carried out to date and those proposed since 2013 indicate that the EU’s Common Agricultural Policy is becoming “green”, that is, to an increasing degree it is integrating the goals of protecting and preserving the natural environment with the economic and social goals of the development of agriculture and rural areas. As a result, the importance of public goods in the reformed CAP is constantly increasing, particularly in the case of environmental public goods, which include water quality, climate protection, soil protection, and the protection of biodiversity and the landscape. The degradation of the natural environment caused by an increased intensity of production, as well as the threat to food safety, are just some of the phenomena that indicate the need for a change in the approach to agricultural problems. To sum up the considerations contained in this chapter, it can be stated that

the groups of the EU-28 regions identified by the cluster analysis have been found to differ significantly in terms of the structure of budgetary subsidies for agriculture, but only model A (in which single farm and area payments were dominant, and the contribution of public good payments was approximately 17%) and model C (which combines different mechanisms of support for farms, with the highest contribution from public good payments, at around 33%) were to a greater or lesser extent in line with the development priorities of the European agricultural model accentuated in the new programming period of 2014-2020. This was confirmed by the significant support given in these agricultural support models for the supply of public goods. Therefore, the results of the analysis make it possible to accept the hypothesis that several agricultural support models can be distinguished in the EU-28, differing in terms of the contribution of public good payments to the total political rent. Over most of the area of the EU in 2012 a model was implemented in which support for agricultural production was replaced by single area and farm payments and support for public goods (model A or C). This is in accordance with the desired direction of evolution of the European agricultural model towards sustainable agriculture, which is most strongly supported in model C (which features the largest contribution from payments for the provision of public goods). In most of the regions of the “old” EU member states, however, the model implemented in 2012 was model B, oriented exclusively towards direct payments, which are treated as a substitute for support for production, and create relatively weak stimuli for sustainable development, whereas in the countries of Central and Eastern Europe model A was dominant, which provides an opportunity for the valuation of the public goods supplied by agriculture.

3.3. Systems of taxation of agriculture in certain EU countries. Universal and distinctive features and an evaluation

(Marian Podstawka¹⁰⁴)

Introduction

Agriculture, as a sector of the national economy, has various distinctive features. These result from the economic characteristics of land, one of the basic factors of agricultural production, in particular its lack of mobility, relative differences in quality and location, and limitations relating to the intensity of production. Agricultural land is a production factor given from outside, hence in cost accounting it is not treated as subject to depreciation. Moreover, agricultural production is conditioned by natural factors, and provides lower effectiveness of inputs and lower profitability than other forms of economic activity. Agricultural land is a production factor requiring special protection in view of its limited nature. It is the basis for the existence of present and future generations. It is therefore necessary to ensure the preservation of its productive functions for the future. However, actions related to the protection of land require certain expenditure. All of these properties of agricultural land cause agriculture to be treated preferentially in systems of taxation. The range of privileges granted to agriculture under such systems results from the particular economic, social and historical conditions to which it is subject and which make the prediction of production effects more difficult in agriculture than in other sectors. Farming carries a significantly greater degree of uncertainty than other types of economic activity, and this reduces farmers' willingness to invest. These conditions make the retransfer of income to agriculture necessary, and justify the provision of support through the tax system. The countries of the European Union have different tax systems, even though their public authorities are working for the same goals. Such differentiation is the result of the sovereign decisions of individual nations. The differences between systems of taxation are the subject of a great deal of discussion among economists. According to one view, such differences are disadvantageous, generating additional transaction costs and leading to unhealthy forms of competition (Zodrow, Mieszkowski 1986) and (Wilson 2004).

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A second viewpoint is that tax differences are beneficial, as they lead to the rationalisation of public expenditure and reflect the comparative advantages that particular EU countries enjoy in the effectiveness of use of production factors in agriculture (Wilson, Wildasin 2004) and (Mendoza, Tesar 2005).

The operation of different tax systems in agriculture in EU countries is a normal practice which leads to competitive advantages within the sector. One element of tax competition is the choice of the base for taxation. In most EU countries, tax is levied on the income earned from agricultural activity. A further factor affecting the level of taxation and competitiveness of agriculture in individual countries is the method used to determine taxable income. EU countries apply a variety of methods for calculating farms' income, from simple estimation methods to those based on financial accounting.

While it is not our purpose here to make a detailed analysis of the determination of bases for taxation in agriculture and the consequences thereof, it should be noted that the tax system in agriculture is expected (like the tax system in general) to perform three basic functions: fiscal, stimulating and controlling. It should also take account of the historical conditions of the economic and financial processes operating in individual countries. Hence the tax policy of EU countries as applied to the agricultural sector is modelled individually depending on the needs and level of development of agriculture (Goraj, Naneman, Zagórski 2014). The variable used to identify the different levels of development of agriculture in various countries is agricultural income.

The aim of this work is to evaluate the systems of taxation of agriculture in EU countries, drawing attention to their common and differentiating features.

Hypotheses:

1. The tax systems applied to agriculture in EU countries are very similar in terms of their structure and the elements of construction of particular taxes.
2. In view of the specific economic and organisational conditions applicable to agricultural production, resulting chiefly from the land factor, limitations stemming from natural factors and the drainage of financial surplus from agriculture, it is appropriate to continue to tax agriculture preferentially and with differentiation between countries.

Research methods

The methods used to verify the hypotheses and achieve the research aims included comparative analysis, descriptive analysis, expert analysis and numerical evaluation.

The evaluation of the tax systems of the analysed countries was performed using the formula below (3.3). It was assumed that the best tax system is one in which no taxes are levied, in which case the indicator takes the value 0, while the worst case is a system with 10 taxes, when the indicator takes the value 1.

$$\text{TSE} = \frac{\text{no.tx} \cdot 10}{100} \quad (3.3)$$

where:

TSE is the numerical evaluation of the tax system;

no.t. denotes the number of taxes.

The evaluation of minimum and maximum income tax rates was made based on the assumption that the most favourable tax for agriculture is one which has zero rates, in which case the indicator takes the value 0. The most restrictive is one which has both maximum and minimum rates of 100%, when the indicator takes the value 1. The following formula (3.4) was used:

$$\text{TRE} = \frac{\text{max.rate} + \text{min.rate}}{100 - \text{max.rate} + 100 - \text{min.rate}} \quad (3.4)$$

where:

TRE is the numerical evaluation of tax rates.

The evaluation of maximum VAT rates was performed using the formula (3.5):

$$\text{TRE}_{\text{VAT}} = \frac{\text{Max. VAT rate}}{100} \quad (3.5)$$

where:

TRE_{VAT} is the numerical evaluation of the maximum VAT rate.

Other evaluations, concerning the manner of calculating the income tax base and the tax preferences applied to agriculture, were made using an expert method.

Data were obtained from the Polish and international literature, published statistics and websites.

Farm income in EU countries

There is more than one concept of income. It is defined differently in economics, in accounting, and in the context of tax law. In economics it refers to the positive difference between revenue and the total actual expenditure. Income reflects the economic surplus which is the basis for the existence of an economic entity, serving to satisfy its consumption and investment needs. Many economists regard income as the best object of taxation (Gomułowicz, Małecki 2000). Income was first taxed in Great Britain in 1799, and the practice became widespread in Europe in the second

half of the 19th century. However, taxable income is a conventional value, defined by way of regulation, being the excess of taxable revenue over the costs allowed under tax law. Hence taxable income cannot be identified with income in the economic sense. Taxable income is one of the most controversial categories in the study of finance. This is because tax law may allow the deduction of different types of costs and recognise different types of tax-exempt revenue. The most accurate view of income taxation may be that given by H. Heller, who evaluates taxable income in terms of the ability to pay tax (Heller 2005). He regards income as constituting all goods serving to satisfy personal needs, such as the value of goods and services produced for one's own needs, the value of consumer goods of permanent use, and the value of housework (cleaning, cooking, etc.). A similar concept of taxable income is presented by R.A. and P.B. Musgrave, who take income to mean the increase in overall economic wealth (R.A. Musgrave and P.B. Musgrave 1980). They regard any increase in wealth, whether regular or irregular, expected or unexpected, realised (consumed) or unrealised (saved), as income subject to taxation.

The income of a farm has certain specific features in comparison with other professional groups. These result from various conditioning factors, including the following:

- a farmer plays the roles of both farm owner and worker;
- in the production process the farm is integrated with the household;
- agricultural income is obtained both in cash (from the sale of goods and services) and in kind (own consumption);
- a farm's income structure may include income from paid work, welfare benefits, agrotourism, processing of agricultural products, and the like;
- agricultural income is subject to a high degree of instability.

An evaluation of the income situation of farms is important not only for farmers, but also for the EU decision makers who shape the Common Agricultural Policy. The collection, processing and analysis of information from the EU is handled by the Farm Accountancy Data Network (FADN). Figure 3.4. shows in outline the method of calculating taxable income from a family farm according to European Union law.

According to this scheme, to calculate the income from a family farm, the total value of crop, livestock and other production is calculated, and then direct costs and general farm costs are deducted to give the gross value added – the surplus representing the effects of the engagement of land, labour, capital and management. This is reduced by depreciation costs to obtain the net value added, which reflects the payment of all production factors: land, capital, labour and management. When the net value added is reduced by costs of salaries, rent and interest, the resulting figure provides information about the income and tax situation of the family farm.

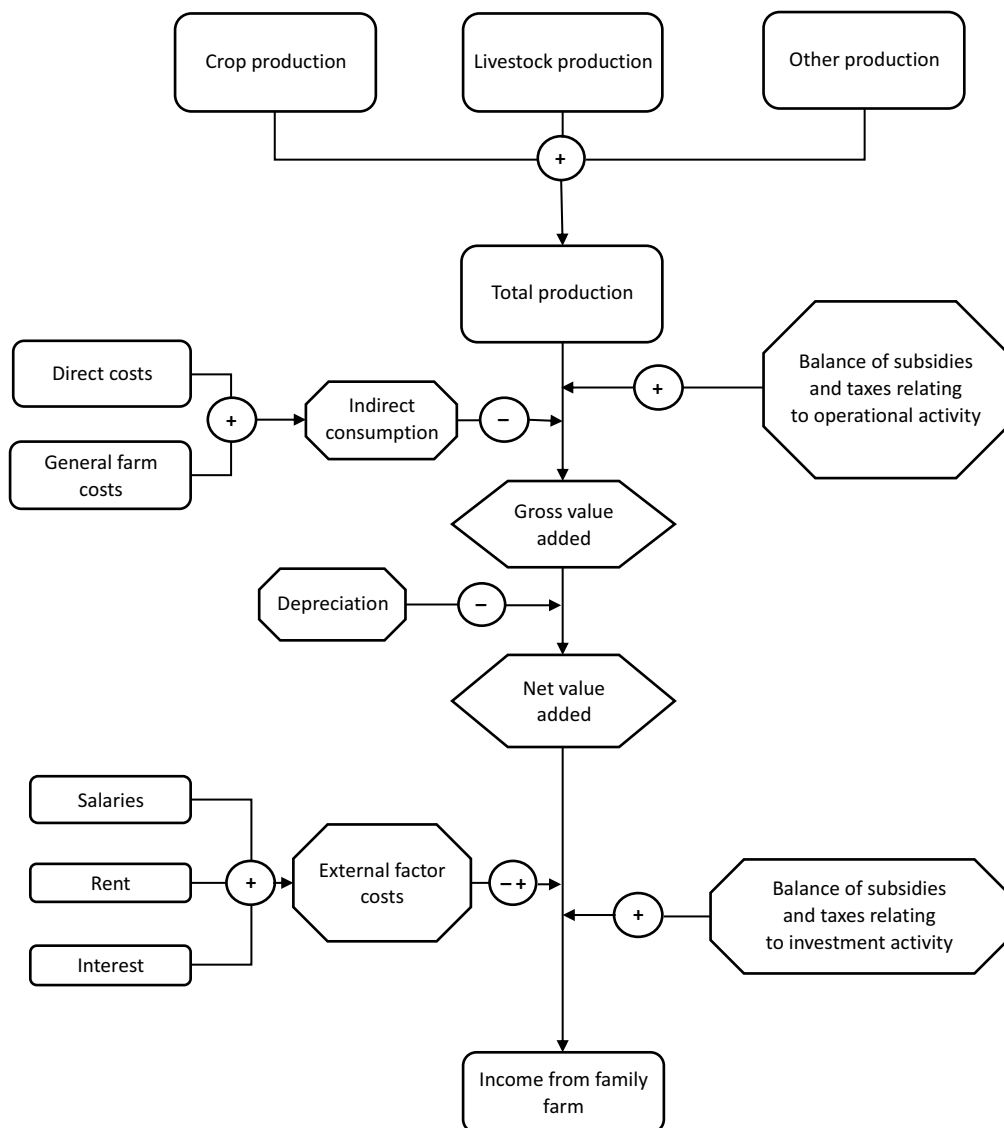


Figure 3.4. Calculation of taxable income from a family farm according to FADN

Source: (Floriańczyk, Mańko, Osuch, Płonka 2013)

A characteristic of EU agriculture is its differentiation in terms of levels of production and income. Information about the differences in the income situation of farms in different EU countries is given in Table 3.5.

Table 3.5. Levels of income of family farms in EU countries (€)

Country	Year			
	2005		2012	
	FNI ^{a)}	FNI/FWU ^{b)}	FNI	FNI/FWU
Belgium	47758	30557	64250	38725
Cyprus	6832	6157	9573	9592
Czech Republic	17940	9533	50501	19035
Denmark	15586	17137	62308	75410
Germany	27944	19604	45381	31985
Greece	14076	12186	11500	12160
Spain	20526	19140	21075	19906
Estonia	15026	7732	25903	16568
France	29518	20056	47403	33116
Hungary	5818	6555	18821	21592
Lithuania	7207	4396	17131	11321
Ireland	18241	17119	22532	19867
Italy	20900	20243	22469	23435
Luxembourg	37405	26944	37284	25692
Latvia	10624	5229	13161	8262
Malta	12569	8898	8560	6940
Netherlands	39917	27639	65913	45801
Austria	23441	16152	27779	21111
Poland	5830	3729	10681	6711
Portugal	8354	3153	12839	10041
Finland	19901	15752	21966	21692
Sweden	11838	9943	16492	14711
Slovakia	-12193	7653	-9175	13768
Slovenia	4989	2771	5417	3866
UK	32672	25197	51632	39470

^{a)} FNI (Farm Net Income) – income from a family farm

^{b)} FNI/FWU (Farm Net Income/Family Working Unit) – income from a family farm per fully employed person

Source: based on the European Commission FADN data

The data in Table 3.5. demonstrate the significant differences in levels of family farm income in EU countries, which in 2005 ranged from a negative income of more than €12,000 per farm in Slovakia to a positive figure of almost €48,000 in Belgium. Markedly better incomes from agriculture are enjoyed in the “old” EU member states such as Belgium, Germany, France, Luxembourg, the Netherlands and the UK, while lower income levels are recorded in newer member states (Hungary, Lithuania, Poland, Slovakia, Slovenia).

Taxation of agriculture in EU countries

Agriculture is subject to various taxes in the countries of the EU, including taxes on income, on assets, and on consumption. The various systems are generally similar in terms of the types of tax, the rules for determining the base for their calculation, and the applied tax rates and preferences.

An assessment will be made here of the tax systems applied to agriculture in selected EU countries, including income tax. An evaluation will be made of the rules for determining the tax base, and the rates applied. VAT will also be assessed, as well as the preferences applied to agriculture in tax policy. Finally, a single evaluative measure will be obtained, making an evaluation possible of the agricultural tax systems in the selected countries¹⁰⁵.

Table 3.6. Structure and evaluation of tax systems in agriculture in EU countries

Country	Income taxes			Taxes on assets			Taxes on consumption	TSE
	Income tax	Corporation tax	Capital gains tax	Inheritance and gifts tax	Tax on transfer of ownership	Tax based on the value of real property or its use	VAT and excise duties	
Belgium	+ ¹	+	+	+	+	+	+	0.7
UK	+	+	-	+	+	+	+	0.6
Denmark	+	+	+	+	+	+	+	0.7
Ireland	+	+	+	+	+	+	+	0.7
Netherlands	+	+	+	+	+	-	+	0.6
Czech Republic	+	+	+	+	+	+	+	0.7
Hungary	+	+	+	+	+	+	+	0.7
Germany	+	+	+	+	+	+	+	0.7
Spain	+	+	+	+	+	+	+	0.7
France	+	+	+	+	+	+	+	0.7
Italy	+	+	+	-	+	+	+	0.6
Portugal	+	+	-	+	+	+	+	0.6
Greece	+	+	-	+	+	+	+	0.6
Austria	+	+	-	-	+	+	+	0.5
Luxembourg	+	+	-	+	+	+	+	0.6
Sweden	+	+	+	-	+	+	+	0.6
Finland	+	+	-	+	-	+	+	0.5
Poland	-	-	-	+	+	+	+	0.4

¹+ present

- absent

Source: (Pawłowska-Tyszko, Soliwoda 2014)

¹⁰⁵ No evaluation was made of taxes on assets, since these are excessively diverse in terms of their types and the elements of their construction.

Table 3.6. shows that all of the listed countries except Poland have tax systems in which agriculture is subject to both individual and corporate income taxes. Many of them also apply capital gains taxes; these are absent in Greece, Austria, Luxembourg, Finland and Poland. All of the countries listed, including Poland, levy VAT on agricultural taxpayers. The most common asset-based taxes are those based on the value of real property and on land use, and those charged on transfer of ownership. The first category is present in all of the countries in Table 3.6. apart from the Netherlands, while the second is absent in Finland. The greatest non-uniformity among EU countries is observed in the case of taxes on inheritance and gifts: these are not applied in such countries as Italy, Austria and Sweden, but occur in the remaining countries.

Table 3.7. shows the differences and similarities relating to the determination of the income tax base in agriculture in EU countries.

Table 3.7. Methods of determining the income tax base for agriculture in EU countries, and their evaluation

Country	Method of calculating tax base	Evaluation
Belgium	The tax base is the actual income, including income from rent and lease of agricultural property, direct payments, securities and employment, reduced by social security contributions on employment contracts, single person allowances, home loan interest, alimony, gifts, and farm workers' salaries. The tax base may also be determined on the basis of standard quantities.	1.0
UK	The tax base is the total income from agricultural activity plus income from savings, dividends, employment, real property, deposits, social security, direct payments and investment subsidies, reduced by capital expenditure (depreciation is not included in production costs) and any losses.	1.0
Denmark	The tax base is the income from the farm plus personal income from salaries, pensions, capital, securities, sale of real property, and direct payments, reduced by social security contributions, loan interest and costs of upkeep of a residential building.	1.0
Ireland	The tax base is the income from agricultural activity plus income from securities and from employment, interest on deposits and loans, real property rent, old-age and disability pensions, and direct payments, reduced by tax relief on account of stocks and investment.	1.0
Netherlands	The tax base is the total income from agricultural activity, direct payments, employment, real property, savings and investments, reduced by expenses relating to the financial condition of the taxpayer such as alimony, education, health care and social security contributions.	1.0
Czech Republic	The tax base (taxable income) is the sum of income from agricultural activity, direct payments, capital and rent, reduced by investment tax relief, losses, gifts, and research and development allowances. Investment subsidies are not subject to taxation.	0.5
Hungary	The tax base is the income from employment (excluding self-employment), from agricultural activity and from real property. Capital gains are not subject to taxation, except for those obtained from foreign subsidiary companies. Compensation and old-age and disability pensions are also not taxed. It is also possible to exclude up to 50% of income from taxation as a provision for development.	0.5

Table 3.7. cont.

Country	Method of calculating tax base	Evaluation
Germany	The tax base is the total income from employment, EU subsidies, agricultural and economic activity, forestry, capital, rent, leasing and services, reduced by social security contributions, expenditure on children's education, alimony, scholarships, and losses.	1.0
Spain	The tax base is the income from employment, production rights, agricultural activity, services, dividends, interest, real property, CAP payments and compensation, reduced by extraordinary losses.	1.0
France	The tax base is the total income from agricultural, forestry and economic activity, employment, capital investments, real property, and beekeeping, reduced by 25% in case of keeping financial accounts and use of a national expert, and by lease payments and extraordinary losses. EU subsidies are included in the tax base only if accounts are kept, but not when the tax base is determined based on standard quantities.	0.5
Italy	The tax base is a quantity of taxable income estimated many decades ago, originating from agricultural activity, employment, capital and land, reduced by alimony payments.	0.5
Portugal	The tax base is the income from employment, agricultural and economic activity, EU subsidies, investments, and benefits and social welfare (old-age and disability pensions).	1.0
Poland	Polish farmers are currently not subject to income taxation. It applies only to a small degree of income from special types of agricultural production, which may be determined according to actual or estimated values. The standards for estimation are out of date and lead to small tax bases and consequently low tax burdens.	0.2

Source: (Pawłowska-Tyszko, Soliwoda 2014)

A significant issue having an impact on the assessment of tax policies applied to agriculture are the set tax rates. These are evaluated in Table 3.8.

Table 3.8. Income tax rates applicable to agriculture in EU countries, and their evaluation

Country	Tax rates in 2015	TRE
Belgium	For corporations 24.98-33.00%. Individual rates 25-50%.	0.60
UK	For corporations 24%. Separate rates for each type of income, 10-50%.	0.43
Denmark	For corporations 23.5%. Individual rates 13.64-55.6%.	0.53
Ireland	For corporations 10-25%. Individual rates 20-41%.	0.41
Netherlands	For corporations 20-25%. Individual rates 1.95-52% (income from shares taxed at 25%).	0.37
Czech Republic	For corporations 19%, for individuals 22%.	0.25
Hungary	For corporations 10-19%, for individuals 6-16%.	0.12
Germany	For corporations 15-17.5%, for individuals 14-45%.	0.42
Spain	For corporations 30%, for individuals 24.75-42%.	0.50
France	For corporations 15-33.33%, for individuals 5.5-45%.	0.34
Italy	From 23% to 43%.	0.49
Portugal	For corporations 12.5-27.5%, for individuals 46.5%.	0.87
Poland	For corporations 19%. For individuals 18-22%.	0.25

Source: (*Agricultural...* 2014)

Table 3.9. gives an assessment of VAT as applied in selected EU countries. The evaluation is made based on the maximum VAT rates applicable to basic means of agricultural production.

Table 3.9. Evaluation of maximum VAT rates in selected EU countries

Country	Max. VAT rate	TRE _{VAT}
Belgium	21%	0.21
UK	20%	0.20
Denmark	25%	0.25
Ireland	23%	0.23
Netherlands	21%	0.21
Czech Republic	21%	0.21
Hungary	27%	0.27
Germany	19%	0.19
Spain	21%	0.21
France	20%	0.20
Italy	21%	0.21
Portugal	23%	0.23
Poland	23%	0.23

Source: based on msp.Money.pl.

Next, Table 3.10. shows an evaluation of the tax preferences applied with respect to agricultural activity in the analysed EU countries.

Table 3.10. Evaluation of tax preferences applied to farmers and agricultural activity in selected EU countries

Country	Preferences related to estimation of taxable income	Preferences related to forms of relief and deductible costs	Evaluation
Belgium	YES	relief is available on account of: – investment – pension contributions up to 30% reduction of the tax computed – charity expenditure, 45% reduction of the tax computed – children – individual depreciation	0.5
UK	YES/NO	relief is available on account of: – loss of income – investment – home upkeep costs – sales of 20% of livestock and agricultural land	0.7
Denmark	YES/NO	– one-off individual depreciation – costs of upkeep of a residential building are deductible (1% of its value) – pension scheme contributions are deducted from income – losses of income may be deductible – investment relief is available; costs include cost of purchase of basic herd, depreciation of long-term plantations, expenditure on food and accommodation for workers	0.6

Table 3.10. cont.

Country	Preferences related to estimation of taxable income	Preferences related to forms of relief and deductible costs	Evaluation
Ireland	NO	<ul style="list-style-type: none"> – investment relief is available for stocks – pension scheme contributions are deducted from income; personal relief is available, as well as relief for elderly persons and for the purchase of a residential building and land 	0.8
Netherlands	NO	<ul style="list-style-type: none"> – relief is available for investment in energy-saving and environmentally-friendly technologies, and for the investment of capital in fixed assets – depreciation may be determined individually 	0.8
Czech Republic	YES/NO	<ul style="list-style-type: none"> – individual (one-off) depreciation – biological assets are not depreciated – investment relief is available for research and development activity – 5% of income may be deducted for charity purposes – productive herd not subject to depreciation – child relief is available, investment subsidies are untaxed 	0.6
Hungary	YES/NO	<ul style="list-style-type: none"> – dividends and old-age and disability pensions are untaxed – losses may be deductible – relief is available for research and development expenditure 	0.7
Germany	YES/NO	<ul style="list-style-type: none"> – housing, investment and personal relief are available, pension scheme contributions, training costs, alimony, gifts, church tax, fees for tax advice and expenses relating to care and accommodation of elderly persons are deductible from the tax base – deductions are available for children and on account of age – losses and accelerated depreciation are taken into account – a certain amount (€45,000) from the sale of a farm is exempt; investment subsidies are untaxed; basic plantations and herds are subject to depreciation 	0.6
Spain	YES/NO	<ul style="list-style-type: none"> – social security contributions, assistance, loan interest and local taxes are deductible – EU subsidies are taxed; losses are taken into account 	0.7
France	YES	<ul style="list-style-type: none"> – the tax base is reduced by 20% if financial accounts are kept – EU subsidies are taxed 	
Italy	YES/NO	<ul style="list-style-type: none"> – investment and personal relief are available, as well as relief for children, religious contributions and home help 	0.8
Portugal	YES/NO	<ul style="list-style-type: none"> – deductions are available for dependents, the birth of a child and education expenses 	0.8
Poland	YES/NO	<ul style="list-style-type: none"> – income tax is levied only on special types of agricultural production – relief is available for rehabilitation, purchase of medicines, donations to public benefit organisations, Internet access, purchase of new technologies, and children 	0.6

Source: (Pawłowska-Tyszko, Soliwoda 2014)

Table 3.11. below shows the overall evaluation of the tax systems of the selected EU countries as applied to agriculture.

Table 3.11. Overall evaluation of tax systems in agriculture in selected EU countries

Country	Evaluative indicators for:					Synthetic evaluation index (SEI)
	tax systems	method of calculation of tax base	income tax rates	tax preferences for agriculture	maximum VAT rates	
Belgium	0.7	1.0	0.60	0.5	0.21	3.01
UK	0.6	1.0	0.43	0.7	0.20	2.93
Denmark	0.7	1.0	0.53	0.6	0.25	2.49
Ireland	0.7	1.0	0.41	0.8	0.23	3.14
Netherlands	0.6	1.0	0.37	0.8	0.21	2.98
Czech Republic	0.7	0.5	0.25	0.6	0.21	2.26
Hungary	0.7	0.5	0.12	0.7	0.27	2.29
Germany	0.7	1.0	0.42	0.6	0.19	2.91
Spain	0.7	1.0	0.50	0.7	0.21	3.11
France	0.7	0.5	0.34	0.5	0.20	2.24
Italy	0.6	0.5	0.49	0.8	0.21	2.60
Portugal	0.6	1.0	0.87	0.8	0.23	3.50
Poland	0.4	0.2	0.25	0.6	0.23	1.68

Source: own compilation

Table 3.11. shows that among the analysed countries, excluding Poland, the differences in the evaluations of the tax systems applicable to agriculture differ only slightly. A lower score indicates a tax system that is more preferential to agriculture, while a higher score represents a more restrictive system. One may distinguish those of the analysed countries for which the value of the indicator exceeded 3.0, namely Belgium, Ireland, Portugal and Spain. In these countries the policy of taxation applied to agriculture is comparatively the most restrictive. A second group consists of countries with indicator values somewhat lower than 3.0, namely the UK, the Netherlands, Germany and Italy. These countries apply a relatively less restrictive tax policy towards agriculture. The third group, consisting of the countries with the most preferential agricultural tax policies, includes Denmark, the Czech Republic, Hungary, France, and of course Poland.

Conclusions

1. Differences exist between countries of the EU in terms of the level of income earned from agriculture.

2. The tax systems applicable to agriculture in the analysed EU countries (apart from that of Poland) are very similar to each other. They include taxes on income, on assets, and on consumption (VAT).
3. The tax systems of the analysed EU countries differ in terms of some of the elements of construction of particular taxes. These differences relate to the tax rates, tax-free sums, relief and exemptions.
4. The tax system applied to agriculture in Poland is distinctive in that it does not include any tax on income from traditional agricultural production.
5. The numerical evaluation of the tax systems applied to agriculture in the analysed EU countries shows them to be very similar to each other. There are no marked differences as regards the degree to which they are restrictive or preferential.
6. The evaluation of the tax systems applied to agriculture in the selected EU countries reveals a distinction between those with the most restrictive tax policies (Belgium, Portugal, Ireland, Spain) and those applying relatively less restrictive taxation to agriculture (the UK, Germany, Italy, the Netherlands).
7. Taking account of historical factors and the different levels of income earned from agriculture in EU countries, it is appropriate to continue the existing solutions as regards its taxation. At the same time, consideration might be given to the possibility of bringing the tax system applied to agriculture in Poland into line with those used in other EU countries.

3.4. Political rents in the EU-27. Comparative analysis

(Bazyli Czyżewski, Anna Matuszczak¹⁰⁶)

Introduction

The concept of political rent is defined based on the theory of rent seeking – but is it conceptually appropriate to contemporary agricultural policy in developed countries? By definition, political rent is inextricably linked to the wastage of resources and to exclusive benefits provided to selected social groups at the expense of others. No attempts have yet been made in the literature to quantify political rents, even though this might lead to an improvement in the effectiveness of public expenditure. This, in the authors' view, is a significant gap. The present chapter aims firstly to review the concepts of rents and rent seeking as used in the literature on political economy with regard to their appropriateness to the discussion on EU agricultural policy. Secondly, the authors attempt to develop a methodology for quantifying political rents in agricultural policy, and apply it to a comparative analysis of rents from the CAP in all of the EU-27 countries in the years 2005-2012. In this way they refute certain widespread myths concerning the CAP, while seeking an answer to the research question as to what part of the subsidies paid to agriculture in the EU-27 is justified by the concept of payment for public goods or compensation for imperfections in agricultural markets, and what part has no objective justification and represents a pure political rent according to the rent-seeking theory. This reasoning makes it possible to evaluate the effectiveness of the allocation of subsidies from the CAP between EU countries and between classes of farms, and also to propose recommendations for the improvement of that allocation.

Dilemmas of rent seeking in EU agriculture

Rent seeking is not a new phenomenon in economic reality. It involves economic entities striving to obtain benefits (primarily financial or material) by exerting influence on relevant institutions, such as through lobbying¹⁰⁷. More detailed definitions refer to active rent seeking, which denotes the expenditure of resources by private firms and interest groups for the purpose of obtaining protective forms of regulation from those in authority (Sztaba 2002).

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¹⁰⁷ The term was first defined by Krueger (1974), although the phenomenon had been considered previously by Tullock (1967).

Rent seeking in EU agriculture, however, does not concern only political lobbying. The claim that subsidies and other instruments of the CAP produce exclusive benefits for farmers at the cost of consumers is somewhat trivial and not entirely accurate. The question would appear to be more complex, as the benefits are not always exclusive, in view of the fact that farmers provide certain public goods, and moreover agricultural producers need to fulfil certain requirements, expending their resources, in order to receive those privileges. According to Tullock, rent seeking is profitable only in conditions of perfect competition and absence of economies of scale (Tullock 1991; Tullock 1980a). If economies of scale are present, the total value of investment required to obtain a political rent is greater than the rent itself (Tullock 1991; Tullock 1980b)¹⁰⁸. This would mean that small family farms, which are not able to generate economies of scale in production, are net beneficiaries of political rents, while large farms, for which meeting the CAP's environmental requirements carries a significant alternative cost, may not receive any net rent. In other words, the cost of producing the public goods required in exchange for political rent exceeds the value of the rent. The present study aims to establish whether this theory of Tullock is applicable to agriculture in the European Union.

In the literature, particularly in the field of political economy, political rents are considered widely, in terms of both the mechanisms for seeking (competing for) them, and their consequences for market processes and well-being. Below we give a review of various theoretical and empirical approaches to the concept of political rent, particularly those which shed a new light on the problem of rent seeking in relation to EU's Common Agricultural Policy. The following hypotheses may be ascribed to these approaches, put forward by the authors cited below (see more Czyżewski, Matuszczak 2017):

- 1) political rents deform market mechanisms and prices;
- 2) rent seeking creates entry barriers to new firms;
- 3) the occurrence of natural resources as production factors encourages rent seeking;
- 4) market imperfections determine the distribution of political rents;
- 5) rent seeking may be complementary to an increase in production (*the theory of complementarity between rent seeking and production*);
- 6) lower income leads to more risky attitudes in rent seeking.

Researchers quite frequently consider the effect of political rents on prices and the related social repercussions (Angrist, Kugler 2008; Deininger 2003), including

¹⁰⁸ "(i)f the organizing of private monopolies, or of influencing the government into giving you public monopolies, is subject to diseconomies of scale, then the total investment in rent seeking will be less than the total value of the rent derived." By contrast, "(w)hen there are economies of scale... total investment to obtain the rents is greater than the rents themselves".

in the agricultural sector. For example, it has been shown (Hvid 2015; Dube, Vargas 2013) that a fall in coffee prices in Columbia, which was largely politically conditioned, led to reductions in wages, and consequently workers were more ready, by way of demonstrating their dissatisfaction, to engage in internal armed conflicts. We know, however, that in countries with a developed democratic system and solid institutional apparatus those damaged by falls in prices organise in order to exert a stronger influence on the politicians and officials who might, by means of regulation, change their situation.

It is debatable, however, whether the second of the aforementioned theses carries over to agriculture. It has been claimed (Parente, Prescott 1994; Bardhan 1997) that when monopoly rights are very strong, firms do not need to introduce innovations to maintain their market share. If firms believe that it is more profitable to allocate resources to protecting their existing monopolies than to research and development, then rent seeking will lead to a systematic weakening in pro-innovative activity (Brou, Ruta 2013). A kind of analogy to the situation of a monopolist is seen in the ownership of farmland in most EU countries. The market for agricultural land is subject to various regulations which undoubtedly create specific entry barriers (Czyżewski, Majchrzak 2014). The present system of area payments not related to production (decoupled payments) exacerbates this problem, leading to ossification of the agrarian structure. Land becomes still less mobile, because even unprofitable farms retain it in order to collect rents.

Another trend in the literature indicates that countries that are rich in natural resources have a tendency to create higher political rents and are more susceptible to rent seeking (Wadho 2014). Does the presence of natural resources in agriculture encourage rent seeking, in line with theories of political economy (Torvik 2001)? Ultimately it certainly does, although the mechanism here is entirely different than in the case of fossil fuels or metal ores. The more valuable the natural environment in rural areas, the lower the level of agricultural output. This relationship can be observed in the case of agriculture, because the market value of the environment is determined by its recreational, scenic, touristic and ecological utility (including its potential for organic food production). This is linked to lower potential advantages of scale and the “profitability” of rent seeking. On the other hand, it is easier for politicians to justify the social appropriateness of paying political rents that are linked to the condition of the natural environment. Payments for public goods have a higher degree of social legitimacy than, for example, attempts to correct the market and compensate for the effects of the cyclical nature of agricultural production.

The best-developed line of research is the one concerned with the effect of imperfections of the market (imperfect competition) and of agricultural policy (imperfect implementation) on the distributional effects (“incidence”) of agricultural

policy (Alston, James 2002; Gorter, Swinnen 2002; Swinnen 2010b). It is found that only 20% of total market and price support in agriculture in the OECD countries creates a net surplus in agriculture, while the remainder flows out to related sectors (OECD 2000), including to landowners (except for individual farms). This phenomenon is referred to by the authors as a “surplus drain” from agriculture, and is particularly marked in the countries of Central and Eastern Europe. Research conducted in Poland shows that it occurs regardless of the scale of agricultural interventionism, and for example in the years 1990-2003, prior to Poland’s accession to the EU, it was equally strong. It can be concluded from this that market imperfections in sectors related to agriculture affect not only the division of political rents to agriculture (if such exist), but also the division of the surplus resulting from increasing agricultural productivity in general. In view of the importance of this problem and the lack of adequate research in this area, we will devote the remainder of this paper to it. In Western Europe and the USA, where agricultural interventionism has operated continually since the 1950s, studies have confirmed that imperfect competition in the areas of agricultural food processing and the manufacture of means of production and service provision to agriculture has a significant effect on the distribution of political rents (McCorrison, Sheldon 1991; Salhofer, Schmid 2004). In turn, it has been shown that the net effect of area payments on the profits of single-product farms is negative. For example, in extensive grain production, while farms profit directly from subsidies and indirectly from the increased efficiency resulting from subsidised investments, they lose significantly due to the increase in prices of rent and purchase of land, the marginal productivity of which increases, stimulating demand. These losses are dominant in the balance of costs and benefits of decoupled payments. Mixed farms, however, may gain overall, as payments from the CAP make it easier for them to obtain credit.

Diverging from the main line of thought concerning the decrease in overall well-being due to the payment of political rents is the “theory of complementarity of rent seeking and production” (Teng 2013b). Based on a model formalisation, that author challenges the universality of the thesis whereby rent seeking is identified with a fall in productivity, and proposes a theory in which increased production and rent seeking are not substitutes. These processes become complementary when the entities seeking rent are also producers, and their production output at the same time constitutes input to the rent-seeking effort. It is not easy to apply this generalisation to agriculture (it would be as if farmers paid lobbyists in agricultural products), but certain analogies may be noted. If it is accepted that the “products” of agriculture include specific public goods, they may also represent a bargaining counter for the agricultural lobby and politicians. In this sense the aforementioned complementarity

of production and rent seeking also arises in agriculture. This is an issue to which we shall return in a later part of our considerations.

The last of the above-mentioned lines of research into political rents refers to the relationships between income (in the sense of material status) and the political risk of rent seeking (Teng 2013a). Stratification of income leads to a polarisation of political views within society. Social groups that have little to lose are ready to make risky political choices (Goemans 2000), which may provide them with exclusive benefits even at the cost of evident losses in total well-being. This problem applies in particular to countries with a fragmented agrarian structure, where semi-subsistence farmers are highly susceptible to the influence of populist slogans.

The above review of the literature leads to the important conclusion that political rents in agriculture diverge from the essence of the concept of rent seeking, which is inextricably linked firstly to the wastage of resources and the loss of overall well-being, and secondly to exclusive benefits obtained by selected social groups at the expense of others.

- If the resources devoted to rent seeking even partly serve to produce public goods, then that part cannot be regarded as wastage (according to the theory of complementarity of rents and production).
- If the payment of political rents to agriculture results in the delivery of any public goods, then these benefits are not exclusive.
- If market imperfections in sectors related to agriculture cause rents and economic surplus to be captured by other entities, then it is even more the case that these benefits are not exclusive.

The above considerations motivated us to attempt to give a new definition of political rent in agriculture, and to develop a methodology for measuring it. There are no reports in the literature concerning attempts to quantify political rents, even though this might lead to an improvement in the effectiveness of public expenditure. It is generally accepted that agricultural incomes are primarily the result of institutional actions rather than an action of the market (subsidies account for approximately two-thirds of agricultural income in EU countries on average). For many years in more than half of EU countries the costs of agricultural production have been estimated to exceed the revenue generated, and if it were not for the subsidies paid to farms, agricultural production would become entirely unprofitable and would have to be discontinued.

We must be aware, however, that the stream of subsidies received by farmers does not in its entirety constitute a political rent as hitherto construed. In this study an attempt is made to evaluate a new category – the “pure political rent” obtained by agriculture in the various countries of the EU-27. To enable this category to be considered, it is necessary to distinguish within the total pool of subsidies received

by a farmer the payment made for public goods generated by the farm, and the part which serves to compensate for the drainage of economic surplus resulting from market imperfections, which cause the prolonged opening of the “price scissors” in agriculture¹⁰⁹. The residual amount can then be regarded as a surplus benefit not having any economic justification, and representing the result of rent seeking.

CAP and compensation for market imperfections

We stated above, based on a review of the literature, that the distribution of political rents is dependent on market imperfections in agriculture and related sectors. Moreover, market imperfections decide not only about the division of political rents, but also about the division of economic rents in general. It is appropriate here to define the concept of an economic rent.

Two different approaches can be found in the literature. The first concerns the choice between the provision and non-provision of services by a given factor of production. This approach was proposed by J. Robinson, who viewed an economic rent as the minimum payment for an engaged factor, which gives it an incentive to continue to provide services with defined productivity (Robinson 1948). The second is the approach of Pareto, which considers the choice between different forms of economic activity: the economic rent is the surplus remuneration of a factor of production giving it an incentive to provide services in its current use. This definition was made precise by P. A. Samuelson, who described an economic rent as the surplus income above the alternative remuneration which a factor might receive in another use (Brooke 2010, Samuelson 1951, Pareto 1896). Some economists contest all of the above definitions. They consider a rent to be any surplus which might be realised without affecting the supply of a given factor of production. A defect of the other definitions is the failure to take account of the non-financial benefits from provided services. Nonetheless, in economics textbooks it is the Paretian approach that has become the norm, and generally the following two definitions of economic rents are given: the additional payment received by a production factor above the transfer income necessary to provide it with an incentive to provide its services in that use (Begg, Fischer, Dornbusch 1993, Kamerschen, Mckenzie, Nardinelli 1992); or any long-term payment received for the use of a resource of a factor of production that exceeds its alternative cost (Kamerschen, Mckenzie, Nardinelli 1992). In the long-term, theoretically, economic rents vanish. The mechanism operates in the following way: at the first stage there is an increase in the real productivity of specified factors

¹⁰⁹ There are also discussions in the literature concerning the distribution of political rents in the context of market failure, for example relating to land, credit, and fishing restrictions (Wilen 1989, Holzer, Lepton, François 2012).

– as a result of the introduction of innovations, for example. These factors provide unique services that have not hitherto been valued by the market. Higher productivity in the short term thus generates an economic surplus and rents to particular factors. At the second stage, however, marginal costs are equalised at a new, lower level, including payment for the aforementioned services, including as a result of the spread of more efficient technology. Rents become costs, and vanish as a result of a striving for effective allocation. This is how an effective market mechanism should function. Paradoxically, however, market players themselves attempt to delay the process of disappearance of economic rents, because these determine their competitive position. Rents are therefore a “forbidden fruit” of the economy – they themselves represent market imperfections, but at the same time, in a market economy there is a continuous seeking of rents, not only of the political kind. This also means that economic rents are a broader concept than political rents, the latter being included in the former.

The question arises of whether it is possible to speak of a “negative economic rent”. This would be either a negative difference between actual income and the income which theoretically persuades factors to provide services, or a long-term payment which is lower than the alternative cost. This would appear to be impossible from a rational choice perspective. Such a situation arises, however, in individual agriculture, when agricultural income is insufficient to pay for the farmer’s own labour and the costs of assets and land. Theoretically, in such a situation the production factors should not provide services – but if the payment for labour and cost of land and assets are not treated in the category of market costs, such a situation may persist. Negative rents on individual farms in agriculture represent benefits to purchasers of agricultural products. Purchasers here are taken to include all recipients – the final consumer as well as suppliers and intermediaries. In a situation where the technical efficiency of agriculture is improving (for example as a result of innovations), a farm should theoretically produce some economic rent, at least over a short period. In conditions of low flexibility of demand for agricultural products, or in other words, in conditions of high price flexibility¹¹⁰, and inflexible supply of agricultural raw materials, this does not happen. We put forward the thesis, which is important for our further considerations, that the high flexibility of agricultural prices and the low flexibility of supply of agricultural raw materials result from market imperfections in areas related to agriculture (under perfect competition, changes in supply should not affect prices). Economic rents in agriculture, whether positive or negative, are therefore essentially rents of price flexibility, and we shall henceforth

¹¹⁰ Tomek and Robinson (2001) define the price flexibility coefficient as $(\Delta P/P):(\Delta Q/Q)$, where P denotes prices and Q output. For more about the technical efficiency of individual farms see (Smędzik-Ambroży 2012).

refer to them as such. They take positive values in conditions of decreasing supply of agricultural products, and negative values when supply is increasing. In this latter situation, the negative rents of farmers correspond to positive rents of other sections of agribusiness. We should add that price flexibility and supply inflexibility are particular characteristics of the markets for agricultural raw materials and food, and do not apply, for example, to the first sector of agribusiness (Davies, Goldberg 1967), namely the manufacture of means of production for agriculture.

A model of the flow of economic rents in agribusiness

In order to model the flow of rents of price flexibility in agribusiness, it is necessary to separate the processes of production and changes in real productivity from changes in prices of products and inputs. The change in real productivity in the agricultural sector without subsidies can be expressed as follows (3.6):

$$\Delta TFP = \left(\sum_{i=1}^n \boxed{Q_{it}} \cdot P_{it-1} - \sum_{i=1}^n Q_{it-1} \cdot P_{it-1} \right) - \left(\sum_{j=1}^m F_{jt} \cdot R_{jt-1} - \sum_{j=1}^m F_{jt-1} \cdot R_{jt-1} \right) \quad (3.6)$$

where:

Q_i is the quantity of product i in successive years ($t-1$, t);

F_j is the quantity of external input j in successive years ($t-1$, t);

P_i is the price of product i in year $t-1$;

R_j is the price of external input j in successive years ($t-1$, t);

ΔTFP is the change in the productivity of factors of production (in money units) resulting from the change in real effects and inputs (neglecting the CAP).

In the above equation, the variable Q_i (marked with a box) is determined by price expectations. Productivity is understood here as the output produced with given inputs. We assume that the second bracket (relating to inputs) in equation (1) is constant, in view of the fact that, among other things, the land factor and a number of other assets are immobile in the case of agriculture (fixed costs).

In turn, the flow of rents resulting exclusively from the change in prices of sold products and externally purchased means of production in agriculture is given by the equation (3.7):

$$\Delta A_{St} = \left[\sum_{i=1}^n \left(\frac{\boxed{Q_{it}} \cdot \boxed{P_{it}}}{HICP} - Q_{it} \cdot P_{it-1} \right) \right] - \left[\sum_{j=1}^m \left(\frac{F_{jt} \cdot \boxed{R_{jt}}}{HICP} - F_{jt} \cdot R_{jt-1} \right) \right] \quad (3.7)$$

where:

$HICP$ is the inflation rate;

ΔA_{St} is the change in the sector's economic rents in period t relative to $t-1$ (the drainage or inflow of economic surplus through prices);

other symbols have the same meaning as in equation (1).

It is assumed that:

$$\Delta TFP = \text{expected change in income}$$

$$\Delta TFP + \Delta A_i = \text{actual change in income}$$

Price expectations in agriculture relate to the values shown in the boxes (in equation 2) for prices of products (P_{it}), prices of inputs (R_{jt}) and inflation ($HICP$). We assume that R_{jt} and $HICP$ are independent of changes in the demand for means of production in agriculture and the supply of raw materials, as the markets for inputs are more competitive, and agriculture makes a relatively small contribution to GDP. Prices of products are equal to the world price plus a national price deviation (3.8):

$$P_{it} = P_{global} + \Delta P_{national} \quad (3.8)$$

The national price deviation $\Delta P_{national}$ is an inversely proportional function of national agricultural production, while the world prices P_{global} are independent of it. In agriculture, as was mentioned earlier, the problem of flexibility of prices is observed, understood as a more than proportional change in agricultural prices in response to a unit change in the supply of raw material (Tomek, Robinson 2001). Hence:

$$\Delta P_{national} = b * \Delta Q_{it} \quad (b < 0) \quad (3.9)$$

or more precisely:

$$\Delta P_{national} = b * (1/\Delta Q_{it}) \quad (b < 0) \quad (3.9a)$$

The hyperbolic function theoretically fits better, because increasingly large increments in output (and productivity) in practice bring about slower rather than proportional falls in prices (cf. Fig. 3.5.).

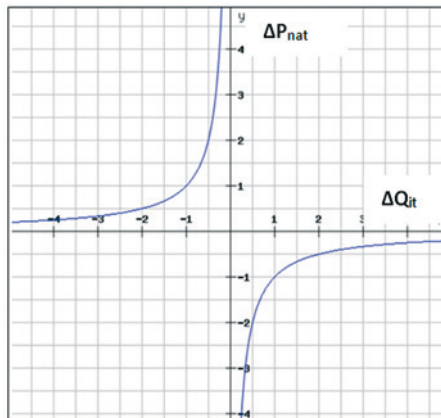


Figure 3.5. Model relationship between national price deviations and changes in output in agriculture in conditions of high flexibility of agricultural prices

Source: own elaboration using http://calcoolator.pl/rysowanie_wykresow_funkcji.html (8.07.2016).

The reason for this is the existence of a profitability threshold, below which it is not profitable at all to harvest crops (such as fruit and grains) or sell livestock (naturalisation of production), along with the possibility of exporting surpluses of agricultural raw materials to regions where the supply is lower. The market's reaction to a fall in production is inverted, and causes an increase in prices. In this case, however, the marginal price increments also become smaller and smaller, in view of the increasing level of imports, and in extreme cases the use of strategic national reserves. Hence:

$$P_{it} = P_{global} + b*(1/\Delta Q_{it}) \quad (b < 0) \quad (3.10)$$

If price expectations in world agriculture are adaptive (as would be indicated at least by the uncertainty relating to weather conditions), P_{global} is described by the function (3.11):

$$p_{global_t}^e = p_{global_t-1}^e + \lambda(p_{global_t-1} - p_{global_t-1}^e), \text{ where } \lambda \in (0,1) \quad (3.11)$$

$p_{global_t}^e$ denotes expected world prices in the period t ;

$p_{global_t-1}^e$ denotes expected world prices in the period $t-1$;

p_{global_t-1} denotes actual world prices in the period $t-1$;

λ is a parameter.

To conclude, the best situation for farmers is one in which $P_{it} = P_{it-1}$, and it is in that direction that they should adjust national output (ΔQ_{it}). The correctness of those adjustments depends on the constancy of parameter b , which corresponds to the price flexibility of demand for agricultural raw materials. Various studies indicate that coefficients of price flexibility of demand for food are slow to change (Zielińska 1979; Zieliński 2002). The point is to act in an anticyclical manner – that is, to increase output and productivity in a period of economic upturn in agriculture (rising agricultural prices), and to reduce them during a downturn, and not the opposite, as generally occurs in countries with a fragmented agrarian system. In turn, the correctness of forecasts of world prices depends on the trends in prices of agricultural raw materials and farmers' access to information about those prices. If both conditions are satisfied, namely $b = constant$ and $p_{global_t}^e = p_{global_t}$, then ΔA_{St} tends to 0 in the long term, and market imperfections do not affect the distribution of economic or political rents.

The second of these conditions is generally not satisfied in countries with fragmented agriculture, in particular in the new EU member states of Central and Eastern Europe (including Poland). As a result, they experience a long-lasting and persistent opening of the price scissors in agriculture, and drainage of surplus from the agricultural sector. Hence there is a rich literature in those countries on the subject of surplus drainage, while in Western Europe and the United States the problem has

not been raised for a long time. It should also be noted that in the countries of Central and Eastern Europe, more or less until the 1980s, economic theory was dominated by Marxist concepts, including the theory of value based on labour. Under that approach it was much easier to determine the value of surplus drainage from agriculture. Today, however, there is no agreement among economists as to the theoretical or empirical basis for the phenomenon. The problem of drainage of rents is nonetheless taking on an ever greater practical importance, because it may hamper the further restructuring of agriculture and the process of concentration of resources in that sector. As to the statement that “agriculture should shrink, but not weaken” (Woś 2003) there is general agreement among economists of various schools. There is debate, however, concerning the reasons for the drainage of added value from the sector, and the consequent proposed solutions to that problem. Many economists attempt to show that the source of the problem is to be found in the inherent features of the market economy, which means that the supply-and-demand mechanism depreciates the sectors in which market imperfections occur in the form of low coefficients of flexibility, immobility and indivisibility of resources, transaction costs, monopolies or monopsonies, entry and exit barriers, and external effects. These problems are a characteristic feature of the agricultural sector, and became particularly visible in the period of political transformation in Poland and other countries of Central and Eastern Europe (Czternasty, Czyżewski 2004). In such conditions market allocation cannot be effective, and prices lose their equilibrising properties. Hence there seems to be a need for state intervention to correct the aforementioned imperfections of the market mechanism by means of appropriate income retransfers and fiscal and monetary policy, with the aim of optimising flows between agriculture and related sectors. In the absence of such action, the agricultural sector will gradually be excluded from processes of expanded reproduction and market exchange, thus producing a number of adverse effects of an economic, social and political nature. This, in brief, is the case made by the supporters of intervention in the agricultural sector, which has in fact been effected within the framework of the CAP for more than half a century, and for significantly longer in certain highly developed countries.

However, if interventionism and protectionism in agriculture, which have been established for centuries (being derived from mercantilism, or even from Platonic ideas), are the cause of the low effectiveness of the structures in that sector, and the present actions of the EU merely reinforce the status quo (Czyżewski 2009c), then market imperfections would be brought about largely by agricultural policy itself, which prevents the rationalisation of costs and effective allocation of resources – in terms of changes in the area structure, for example – to make them more productive. The problem here is one of national policy imperfections or market failure. Supporters of this viewpoint argue that the incomes of production factors are shaped by the

effective allocation of inputs in various subsystems of the national economy, and they challenge the claimed accumulation of market imperfections in agriculture. According to A. Kowalski and W. Rembisz, external effects are generated not by a defective market, but on the contrary, by an absence of market mechanisms in terms of certain products (Kowalski, Rembisz 2005). The market mechanism forces an increase in the intensity of agricultural production, which undoubtedly triggers negative external effects in the form of degradation of the well-being of the countryside, broadly defined – the natural environment, landscape, rural culture, etc. Can the market effectively regulate the supply of public goods, as wished by the proponents of the concept of imperfections in the policy of interventionism? Supporters of the “state failure” concept also deny the problem of information asymmetry, which in their view applies to all sectors equally. Attention should nonetheless be drawn to the degree of monopolisation in the sectors related to agriculture, which in the countries of Central and Eastern Europe is very high compared with other sectors. A similar debate concerns public goods. Are they present only in agriculture, because only then are there grounds for agrarian intervention? The current reforms of the CAP indicate that agricultural land is a basic public good, because it is inextricably linked to the well-being of the natural environment. For this reason EU agricultural policy should ensure its durability and renewability, so that it can be passed on to subsequent generations in an undeteriorated state.

The solution to state inefficiencies may be liberalisation and deregulation of processes of production and exchange in agriculture, setting in motion mechanisms of competition leading to permanent structural changes in the sector. Insofar as family farms are acted on by market stimuli, and the modern state is able to give up the doctrine of food self-sufficiency and national ownership of land, and permit a widening of social inequalities, the liberal recipe is entirely justified.

The final argument of the opponents of state intervention in the agricultural sector involves challenging the assumptions concerning the mechanism of drainage of added value (Czyżewski 2009b). A surplus of produced added value over realised (divided) value is in fact only possible under an input approach based on costs of production (Kowalski, Rembisz 2005), which derives from classical economics. The theory of value based on labour is considered by some economists not to fit the contemporary reality. It can be debated whether in the light of current metamorphoses and social awareness of the importance of agriculture, this is not a sector in which the input theory should be maintained even at the cost of budget transfers. That, however, is a subject for another discussion.

In the authors’ view, the thesis of surplus drainage is confirmed also in the light of modern subjective theories of value, wherein prices are shaped based on the rational expectations of market players. This is the objective of the methodology,

proposed above, for the quantification of flows of economic rents, whereby real changes in productivity (ΔTFP) are treated separately from nominal flows (occurring exclusively through price changes, ΔA).

Measuring political rents

The value of political rents for a representative farm over a long period lasting for n years is computed as (3.12 and 3.13, see more Czyżewski, Matuszczak 2017):

If $\Delta A_{S1} + \Delta A_{S2} + \dots + \Delta A_{St} < 0$

$$\begin{bmatrix} PR_1 \\ PR_2 \\ \dots \\ PR_t \end{bmatrix} = \begin{bmatrix} \sum_{i=1}^n S_{1i} \\ \sum_{i=1}^n S_{2i} \\ \vdots \\ \sum_{i=1}^n S_{ti} \end{bmatrix} - \begin{bmatrix} \sum_{j=1}^m VPG_{1j} \\ \sum_{j=1}^m VPG_{2j} \\ \vdots \\ \sum_{j=1}^m VPG_{tj} \end{bmatrix} + \begin{bmatrix} \Delta A_{S1} \\ \Delta A_{S2} \\ \dots \\ \Delta A_{St} \end{bmatrix} \quad (3.12)$$

If $\Delta A_{S1} + \Delta A_{S2} + \dots + \Delta A_{St} \geq 0$

$$\begin{bmatrix} PR_1 \\ PR_2 \\ \dots \\ PR_t \end{bmatrix} = \begin{bmatrix} \sum_{i=1}^n S_{1i} \\ \sum_{i=1}^n S_{2i} \\ \vdots \\ \sum_{i=1}^n S_{ti} \end{bmatrix} - \begin{bmatrix} \sum_{j=1}^m VPG_{1j} \\ \sum_{j=1}^m VPG_{2j} \\ \vdots \\ \sum_{j=1}^m VPG_{tj} \end{bmatrix} \quad (3.13)$$

where:

$PR_{1...t}$ is the political rent in period $1...t$;

t is the number of periods

n is the number of subsidies;

m is the number of payments for public goods

S_i is the subsidy paid to agriculture under the CAP;

VPG_j is the payment for the public goods supplied by a representative farm according to the CAP institutional valuation;

other symbols have the same meanings as in equation (3.6).

By the above methodology, $PR_{1...m}$ was computed for an average farm from the EU-FADN representative sample, according to classes based on standard output (SO) in the EU-27 countries in the period 2005-2012 (approximately 85,600 farms are represented by the EU-FADN sample). For the purpose of estimating the value of rents for the whole population of representative farms using the FADN sample in a given country, the aggregate values $\sum_{i=1}^n S_{im}$, $\sum_{i=1}^n VPG_{im}$ and ΔA_{Stm} for an average

farm were multiplied by the number of representative farms in the class in question. The SO classes are defined based on the value of output corresponding to the average situation in a given region for various types of agricultural production. In the EU-FADN methodology, farms with an SO value in the range €2000-8000 are described as “very small”, those over €8000 up to €25,000 as “small”, those from €25,000 to €50,000 as “moderately small”, those over €50,000 up to €100,000 as “moderately large”, those above €100,000 up to €500,000 as “large”, and those above €500,000 as “very large”. Price indices and values of HICP for the agricultural sector are taken from the Eurostat database.

Long-term political rents in the EU countries related to the gross receipts

In accordance with the methodology adopted, political rents were computed for farms belonging to various standard output classes over a period of eight years, in the “old” and “new” member states of the EU. We recall that the values given represent that part of EU agricultural subsidies which has no objective justification either as payment for public goods or as compensation for market imperfections affecting agriculture (leading to high flexibility of agricultural prices). They therefore have the features of political rents to a large extent. The analysis made by the authors represents a pioneering attempt to quantify the phenomenon of political rent, and refutes many of the myths that have developed around it.

The sum of political rents in the EU in the period under analysis was estimated at close to €350 billion, which is no small amount if compared with the EU’s entire budget for the years 2007-2013, which amounted to approximately €860 billion. An analysis of the rent realised in a given country over the analysed period as a proportion of total political rent in the EU shows that the greatest beneficiaries of rent seeking are the countries where agriculture is the strongest, including France (which receives almost one-fifth of the total rent), followed by Germany (14.1%), Italy (11%) and Spain (10.3%). Hence farmers in just four countries capture more than half of the political rents from the CAP. It may be thought that this is linked to the lobbying strength of agricultural organisations from those countries and their engagement in the creation of agricultural policy. Confirmation of this comes from the fact that of the total political rents in the EU-27, the EU-15 countries account for as much as 83%, with only 17% going to the remaining member states (Tab. 3.12. and Tab. 3.13.).

Another issue is the contribution of political rents to the production (gross receipts) of agriculture in a given country, shown in the penultimate column, comparable to the PSE indicator. On average in the EU-27 this contribution is

Table 3.12. Political rents realised in the EU-15 countries in 2005-2012

Country	Political rent (€ bn)	Political rent as % of gross receipts from agriculture (comparable to PSE and FRGE c.f. Tab. 2.4.)	Political rent of country as % of total rents in EU-27
Austria	9.45	21.66%	2.7%
Belgium	2.52	5.72%	0.7%
Denmark	7.80	12.04%	2.2%
Finland	7.69	28.75%	2.2%
France	67.26	14.61%	19.3%
Germany	49.29	14.77%	14.1%
Greece	16.75	21.00%	4.8%
Ireland	11.74	25.83%	3.4%
Italy	38.39	10.89%	11.0%
Luxembourg	0.54	21.24%	0.2%
Netherlands	6.42	4.32%	1.8%
Portugal	3.55	7.27%	1.0%
Spain	36.12	12.09%	10.3%
Sweden	5.51	15.23%	1.6%
UK	25.77	15.69%	7.4%
EU-15 total	288.8	13.02% (weighted mean)	82.7%
EU-27 total	349.42	13.63% (weighted mean)	100.0%

Source: author's calculations based on FADN data (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

13.63%, and although in the EU-12 it is slightly higher, and in the EU-15 somewhat lower than average (Tab. 3.12. and Tab. 3.13.), there are countries in which that value is exceeded almost twofold. We shall notice however that it is 40% less than the PSE indicator which accounts for 22.6 in the EU. It means that the PSE is erroneous to some extent while assessing political rents and its error increases with regard to the countries of intensive agriculture (i.e. Belgium, cf. Tab. 2.4.)

The authors analysed the reason why political rents account for more than 25% of the production of agriculture in Ireland, 28% in Finland, 26% in Latvia, 24% in Lithuania, or 21% in Slovakia. In all of the extreme cases the problem lies in the low real productivity of agriculture, and not in market imperfections, which affect agriculture in all countries to a similar degree. For example, Irish agriculture uses a very large quantity of materials – the ratio of indirect consumption to production averages approximately 1 over the year, compared with an EU average of 0.66. A similar conclusion applies to agriculture in Finland, Slovakia and Latvia. It can be asked whether such extreme differences in the level of subsidisation of low productivity from the CAP budget is socially just, in terms of the balance of costs

Table 3.13. Political rents realised in the EU-12 countries in 2005-2012

Country	Political rent (€ bn)	Political rent as % of gross receipts from agriculture (comparable to PSE and FRGE cf. Tab. 2.4.)	Political rent of country as % of total rents in EU-27
Bulgaria ¹	2.91	12.08%	0.8%
Cyprus	0.34	7.59%	0.1%
Czech Rep.	5.79	18.65%	1.7%
Estonia	0.91	19.94%	0.3%
Hungary	9.62	21.33%	2.7%
Latvia	1.80	26.79%	0.5%
Lithuania	3.51	24.61%	1.0%
Malta	0.09	10.37%	0.0%
Poland	22.36	16.35%	6.4%
Romania	8.85	9.00%	2.5%
Slovakia	3.05	21.30%	0.9%
Slovenia	1.38	15.14%	0.4%
EU-12 total	60.61	15.46% (weighted mean)	17.40%
EU-27 total	349.42	13.63% (weighted mean)	100.0%

¹ 2008-2012 in the case of Bulgaria and Romania

Source: author's calculations based on FADN data (granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

and benefits for the community as a whole. What benefits does the EU taxpayer obtain by subsidising highly inefficient agriculture in certain countries? Naturally, indirect benefits can be found, such as the maintenance of agricultural incomes and thereby the livelihood of rural areas, prevention of the depopulation of those areas, and assurance of internal demand for food. This may be an indication of how the CAP could be more effectively modified so as to achieve the desired effects, or at least those relating to the supply of public goods. Perhaps countries with structurally inefficient agriculture should supply more public goods than they do at present, if they wish to maintain their current ratio of political rents to production, or else subsidise their agriculture to a greater degree out of national funds.

Rents of price flexibility and non-equivalent subsidies in EU-15 and EU-12 countries

The next part of the analysis concerns the allocation of rents of price flexibility in the years 2005-2012, as well as non-equivalent subsidies, namely those the receipt of which is not conditional on the supply of public goods. In practice, this concerns chiefly the subsidies from the first pillar of the CAP (uniform area payments and supplementary payments), but also the balance of subsidies and penalties for milk

production, and subsidies for external consumption, costs of external factors, investment, etc. The presentation of these two values alongside each other makes it possible to assess the dynamics of political rent. When rents of price flexibility are negative, non-equivalent subsidies serve to absorb the effects of market imperfections (Czyżewski, Matuszczak 2017).

As regards the results of the analysis, it is hard to identify any unambiguous trend in changes in the scale of market imperfections (measured in terms of the value of rents of price flexibility) or non-equivalent subsidies, but the results presented in Tables 6 and 7 suggest the following conclusions:

- 1) The overall variability of non-equivalent subsidies among the EU-27 countries is relatively large – the coefficient of variation ranges from approximately 3% to 34%. It is higher in the new member states of the EU-12 than in the EU-15, the respective average values being 24% and 10% (cf. Tables 3.14. and 3.15.). It may be concluded that political factors play a greater role in the EU-12 countries. This nonetheless has a destabilising effect on agricultural output.
- 2) At the same time this can be considered a manifestation of a political cycle, which is expressed by significant fluctuations in the total value of non-equivalent subsidies, including chiefly supplementary payments, since national governments adjust the pool of supplementary payments in a given year to the current budgetary and political situation, depending on the current capabilities of the national budget. Hence, the popular opinion that CAP subsidies have been stable since decoupling is a myth.
- 3) An exception is uniform payments, the timetable of which in each country is determined at Commission level for the entire financial framework. However, subsidies for indirect consumption, external production factors and investments go primarily to farms in the highest SO classes, where susceptibility to market imperfections and drainage through prices is the greatest. In this sense they are also conditioned by the economic cycle, because in conditions of worsening price relations a larger part of them flows out of agriculture.
- 4) The above implies that the CAP does not perform an anticyclical function (having the economic cycle in mind), because a significant part of the subsidies (approximately one-third) decreases in conditions of economic downturn, when member states' budgets deficits are rising. On top of this are the irregular fluctuations, from the standpoint of the Community as a whole, related to the electoral calendars of particular countries. Hence political rents function only to a certain extent as a buffer against economic fluctuations in agricultural markets, and “market imperfections” still destabilise resource management conditions in agriculture to a significant degree.

- 5) The effect of the economic cycle on agricultural markets is manifested in the inflow and outflow of economic surplus through agricultural price fluctuations. For this reason in 2008 and 2009 the economic rent showed a marked decrease, and in some countries there was no rent at all in that year (cf. Tables 3.14. and 3.15.).
- 6) An analysis of the correlation between the amount of non-equivalent subsidies and the adverse impact of market imperfections on agriculture (negative rents of price flexibility) shows greater differentiation among the EU-15 countries (between -0.67 and 0.82) than among the EU-12 countries (between -0.39 and 0.47). It is possible to distinguish several characteristic groups of countries, in which:
- there is no relationship between the two values, as in (for example) Greece, Sweden, Lithuania and Malta;
 - there is a relatively strong negative correlation, as in Ireland (-0.67) and Belgium (-0.59). Such a correlation should be evaluated positively, since it implies that a higher drainage of surplus through prices is accompanied by higher subsidies, which may cautiously be viewed as an anticyclical feature (although it is not clear whether this is intentional);
 - there is a relatively strong positive correlation between rents of price flexibility and subsidies, as in Finland (0.82), France (0.63), Denmark (0.47) and Bulgaria (0.46), which can be interpreted as procyclical action, inconsistent with the aims of the CAP.

The question thus arises of how consciously such countries as Ireland and Belgium shape their national agricultural policy (in the form of supplementary payments and others left to the discretion of the member states) to give it an anticyclical character. Admittedly, it is not explicitly laid down anywhere that the CAP is to be anticyclical, but this is implied indirectly by other aims, such as the stability of agricultural incomes. It is in any case certainly not the intention that subsidies, particularly those left to the discretion of individual countries, should be procyclical – this would be inconsistent with the overall idea of agricultural policy. Hence, if non-equivalent subsidies are to be of a deliberately anticyclical nature, then at times when prices are becoming less favourable to agriculture (when there is drainage of economic surplus through price flexibility) those subsidies should increase. It should be noted, however, that this principle again conflicts with the idea of decoupling, since such anticyclical actions could easily bring about a repeat of food overproduction, which has already been a problem for the EU. It is therefore debatable whether EU agricultural policy should retain its dual nature, with declared systemic decoupling on the one hand, but with various doors left open for the level of subsidy to be linked to output. These doors are not, however, used consciously by

Table 3.14. Drainage of economic surplus and non-equivalent subsidies¹ in the EU-15 countries in 2005-2012 (€m)

Country	2005		2006		2007		2008		2009		2010		2011		2012		Coefficient of variation for non-equivalent subsidies	
	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies		
Austria	224	1161	277	1221	368	1194	-233	1262	-799	1318	507	1255	119	1063	154	973	-0.38	0.10
Belgium	76	625	359	726	-324	769	-1616	797	-1415	748	-684	829	-1570	792	-957	789	-0.59	0.08
Denmark	-307	926	331	1027	-251	967	-149	991	-1257	984	1104	994	705	1001	546	1031	0.46	0.03
Finland	-267	465	15	1065	182	1072	-42	1092	-64	994	37	1067	35	1030	79	1009	0.82	0.21
France	-1276	7981	1775	8954	4128	8106	-277	8372	-7415	7815	4420	8670	3904	8524	1212	8676	0.63	0.05
Greece	-19	1901	63	2448	442	2232	-473	2444	-198	1974	107	1999	-60	1855	-48	1714	-0.07	0.13
Spain	599	4127	-1389	4440	514	4009	-1884	4749	-2701	4813	1363	5597	-964	5584	1365	5900	0.24	0.15
Netherlands	48	684	556	859	-171	777	-935	784	-1404	865	1865	928	-528	940	409	917	0.28	0.11
Ireland	-114	1471	37	1479	244	1009	-194	1753	-462	1834	518	1461	353	1401	-26	1459	-0.67	0.17
Luxembourg	-6	55	7	60	16	64	-13	63	-28	66	19	69	9	82	7	79	0.31	0.13
Germany	-486	5523	1219	6301	2291	5959	-2190	6061	-4571	6420	6241	6553	2104	6294	514	6182	0.25	0.05
Portugal	-66	484	-202	488	15	419	-140	452	-309	540	50	580	-166	593	17	681	0.16	0.16
Sweden	-40	648	17	705	304	674	-40	723	-382	667	388	668	51	754	-87	713	-0.06	0.05
UK	-780	3830	216	3701	1230	3392	932	3202	438	3344	-126	3297	-229	3206	-855	3318	-0.31	0.07
Italy	-2741	5123	1071	5507	2418	4844	-2474	4279	-372	4261	1267	4703	1531	4840	1027	4831	0.26	0.09

¹non-equivalent subsidies understood as the difference between total subsidies and payments on account of public goods (set-aside, LFA, payments)
Source: author's calculations based on FADN data (see more Czyżewski, Matuszczak 2017; granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

Table 3.15. Drainage of economic surplus and non-equivalent subsidies¹ in the EU-12 countries in 2005-2012 (€m)

Country	2005		2006		2007		2008		2009		2010		2011		2012		Correlation of rents of price flexibility and non-equiv. subsidies	Coefficient of variation for non-equivalent subsidies
	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies	rents of price flexibility	non-equivalent subsidies		
Bulgaria ²	-	-	-	-	-	-	-212	472	-734	598	276	612	452	594	467	711	0.47	0.14
Cyprus	-4	54	0	53	-22	42	17	86	-16	55	-53	38	31	40	-1	41	0.39	0.31
Czech Rep.	-258	577	15	734	267	748	-81	892	-982	879	342	935	575	1022	-34	225	0.17	0.34
Estonia	-21	64	-10	78	60	81	-60	138	-133	118	111	136	63	156	6	158	0.14	0.32
Lithuania	20	327	19	514	140	240	-102	359	-202	554	247	561	141	515	-161	473	-0.07	0.27
Latvia	-53	161	26	221	39	211	-115	260	-69	267	146	253	33	291	-10	190	0.10	0.19
Malta	-9	11	-3	12	5	14	5	16	9	8	-6	12	-6	10	4	8	0.00	0.25
Poland	-597	1390	963	1882	1379	2320	-2129	3019	-1821	3055	2347	3464	1830	3635	-400	3595	0.12	0.30
Romania	-	-	-	-	-	-	220	1823	-348	1769	105	1549	786	1574	648	1822	-0.18	0.08
Slovakia	-93	216	-36	268	132	290	-71	345	-245	478	218	485	124	511	73	456	0.25	0.30
Slovenia	-2	100	32	107	34	136	-94	203	-65	200	11	233	10	204	6	210	-0.39	0.30
Hungary	-112	1059	333	979	753	1122	-1079	1204	-409	1221	665	1290	532	1453	607	1287	0.17	0.12

¹non-equivalent subsidies understood as the difference between total subsidies and payments on account of public goods (set-aside, LFA, agri-environmental payments, other payments for rural area development)

²for Bulgaria and Romania during the period of their membership, i.e. from 2008

Source: author's calculations based on FADN data (see more Czyżewski, Matuszczak 2017; granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

many countries, particularly those of the EU-12. As a result, in the EU-12 most of the “coupled programmes” implemented by national governments have an unintended procyclical effect (cf. the positive correlation coefficients in Table 3.14.). Perhaps it would therefore be better to aim for a complete decoupling of subsidies from output, and to restrict the CAP to uniform payments only.

Conclusions

The new approach proposed by the authors is necessary, as it provides an indication of how to improve the effectiveness of allocation of support for agriculture in individual EU countries. Quantification of the political rent in agriculture enables a more rational and socially appropriate distribution of assistance from the CAP in accordance with the goals set for agricultural policy in the new financial framework after 2014. Although the division of payment envelopes between member states has already been decided, since 2014 the CAP has gained flexibility in terms of the structure of both pillars and transfers between them. These matters remain in the hands of the governments of member states. Calculations show that the structure of payments under the first and second pillar in the years 2007-2013 was strongly influenced in many countries by the political cycle, not to mention the fact that certain programmes had effects that were procyclical and destabilising. The chaos existing in this regard weakens the point of “decoupling” that has been implemented by the EU since 2003. The problem may be that in many countries breaking the link between subsidies and output was reflected more in declarations than in facts, and that ways are constantly being sought to “get round” that requirement. Such attempts exacerbate the King’s effect, and mean that a large part of the subsidies are not capitalised within agriculture, but are captured by related sectors. What we have in mind here is the fact that, for example, investment support goes mainly to the largest farms, where it is subject to the strongest drainage through price flexibility. Redefinition is also required as regards the issue of social fairness in the determination of the sizes of national CAP envelopes. The calculations of political rents show that historical payments are neither a rational nor a just solution.

Part 4.

Regional Perspective. How to Measure and How to Support Sustainability in Agribusiness?

4.1. Sustainable development in the Pila subregion

(Joanna Strońska-Ziemann, Andrzej Czyżewski¹¹¹)

Introduction

Of the vast range of published criteria for measuring and evaluating sustainable development, most of them are geared to the global or national level (Bühler-Natour, Herzog 1999, Graymore et al. 2008). It should be emphasised that sustainable development is not, according to the literature, a single, well-defined concept. There are numerous perspectives, yet whichever view is chosen, it always entails a normative choice of indicators (van Zeijl-Rozema et al. 2008). Two different perspectives on sustainable development and its assessment were analysed: UNECE's measurement of sustainable development at the national level, and the Dutch method for measuring at the regional level – INSURE.

Sustainability in the literature

According to UNECE, sustainable development is development that could be continued for a very long time, meaning increasing well-being for several generations. According to that institution, the measurement of sustainable development may be based on the concept of well-being, provided that it is broadened beyond its traditional scope in economics. Therefore, instead of focusing on consumption defined as enjoyment of goods and services purchased in the market, it should be construed as enjoyment of any good or service that contributes to well-being, including things freely provided by nature like forest products and beautiful sunsets. It should also include the enjoyment of the benefits of human rights or psychological fitness as forms of consumption. There are two opposing views on the relationship between short- and long-term well-being and sustainable development. The first, called the *integrated view*, holds that the goal of sustainable development is to combine the well-being of the current generation and the potential for the well-being of future generations. According to the second, the *future-oriented view*, the main concern of sustainable development is to ensure the potential for the well-being of future generations. Yet it is important to emphasise that it is wealth per capita, not the total wealth of society, that should not decline over time. Although increase of wealth does not guarantee sustainability of development, deterioration of capital stocks per capita would make sustainable development impossible. Sets of indicators depend on priorities and data

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availability among countries – everywhere a strong relationship between policy and indicators can be noticed. Thus, it is important to set appropriate sustainability goals, as then adequate indicators might be selected; obviously the clearer the goals, the clearer the indicators. The criteria to be used when making decisions on indicators should include objectivity and ease of use (Reed et al. 2006), availability of time series, and inclusion in official government-formulated sustainable development indicator (SDI) lists (Herrera-Ulloa et al. 2003). There are also further criteria that should be included such as simplicity, scope, quantification, sensitivity, and timeliness (Kelly, Moles 2002). When indicators are chosen it is important to decide on the weight that is assigned to each factor. Some analysts believe that all indicators have equal importance (this view is expressed in reports of the European Commission 2005a, 2007, Provincie Limburg (België) 2006, IISD, JRC 2009), whereas others use participatory processes to rank indicators by importance (Kelly, Moles 2002, Mickwitz, Melanen 2009). In order to make a reliable assessment of sustainable development, not only should a set of indicators be chosen, but they should also be optimally combined (cf. Grosskurth, Rotmans 2005, Wiek, Binder 2005). Therefore regression analysis is commonly used (Putzhuber, Hasenauer 2010) to seek out weakly correlated indicators (Herrera-Ulloa et al. 2003). Broad consistency among countries can be observed; for example, most sustainable development indicator sets include an indicator on greenhouse gas emissions. Within the European Union there is an inevitable convergence among the national indicators used, because the indicators used by newer member states are influenced by those adopted by older member states, which usually had better-established national indicator sets. Sustainability is measured based on a very broad view of consumption and consequently of capital, i.e. five equally important individual stocks: financial capital (stocks, bonds and currency deposits), produced capital (machinery, buildings, telecommunications and other types of infrastructure), natural capital (natural resources, land and ecosystems providing services such as waste absorption), human capital (an educated and healthy workforce), and social capital in the form of functioning social networks and institutions. According to this perspective, the measurement of sustainability is indeed viable, as it can be precisely determined whether a particular form of capital per capita is increasing or declining over time and whether there are inevitable tradeoffs which should be weighted while development proceeds.

At the regional level, indicators usually do not tell us much about how well a system is progressing in terms of the goal of sustainability, as it is difficult to take account of the specific regional situation. According to some researchers, the measurement of sustainable development based on national-level data might fail to capture critical issues at the regional level (Bühler-Natour, Herzog 1999, Herrera-Ulloa et al. 2003, Reed et al. 2006). Yet it is important to assess sustainability at

the level of regions which have an optimal size for successfully implementing sustainable development: they are small enough to be of direct interest to residents, and large enough to possess critical mass for creative solutions (Zilahy, et al. 2009). Also, such a unit of analysis incorporates processes that go beyond the regional level (McManus 2008). However, since values might differ significantly across regions, Stevenson and Ball (1998) suggest using materials that allow for variability instead of applying generic standards. In the view of some researchers, sustainability should be determined by values of the local community which fit within the broad framework of the triple bottom line (people, planet, profit – i.e. social, environmental and economic aspects) or the Brundtland definition (Stevenson, Ball 1998, Reed et al. 2006, Wallis 2006). Consequently, tools used to assess progress have to be developed within the context of the local landscape (Wallis 2006). The INSURE¹¹² project was launched to develop meaningful indicators of sustainable development at the regional level. It has the aim of designing a generic approach for the assessment of sustainable development without following the standard approach of predefining a universal indicator set. However, it did not design a context or goals for each region, but showed how important it is to define them when measuring sustainable development. INSURE operationalised the step of setting goals and context by using an existing political expression of sustainable development.

Based on these two methodologies it might be concluded that, while a generic approach may be applicable to analyses at national level, no such standard approach using a predefined universal indicator set is possible in the case of regions. Therefore, although some general approach might be followed, it is necessary to design certain individual indicators appropriately to the problems of a particular region. The sustainability of development of the Pila subregion was assessed based on elements of both the UNECE and INSURE methodologies. From the UNECE methodology the availability of time series and the strong link between sustainability goals and indicators were maintained; also the simplicity and quantification of data were taken into consideration. It was decided that all indicators would have equal importance, therefore no weights were applied. After indicators available at municipality level had been chosen, the commonly applied regression analysis was used to seek out weakly correlated indicators. The five individual stocks mentioned in UNECE's methodology – financial capital, produced capital, natural capital, human capital and social capital – were combined into four equally important components: financial and produced capital together formed an economic component, natural capital formed an environmental component, social and human capital together created a social component, and the part of produced capital concerning infrastructure formed a

¹¹² Flexible Framework for **I**ndicators for **S**ustainability in **R**egions, Using System Dynamics Modelling

spatial component. However, the INSURE methodology was also taken into account in the choice of indicators – values fit within the framework of the triple bottom line (people, planet, profit – i.e. social, environmental and economic aspects). Accordingly, the indicator of development for each municipality included the four above-mentioned components and was intended to determine the differences between municipalities in the subregion, i.e. to quantify the deviation of each municipality from the median value of the subregion. Initially, the reference point was planned to be the mean value for the subregion, but due to the danger of a strong distortion of the mean by extreme values, the median value was used instead.

Regional sustainable development indicators

Due to problems related to the simultaneous comparability of several variables, a multivariate analysis was used. A separate taxonomic analysis was carried out and the overall indicator for each of the 11 subcomponents was assessed. Based on the results, a comprehensive evaluation of the components and subsequently an overall assessment of sustainable development were performed. The partial indicators were treated as diagnostic features of development; therefore the taxonomic analysis of the whole component comprised an analysis of the aggregated indicators of each component. Furthermore, to enable a comparative analysis, a synthetic indicator of the achieved level of development was assessed, this being a function combining the partial information. Consequently, the data were standardised from 0 to 1, and then the standardised sums method was used based on the formula for the synthetic Perkal index (4.1):

$$s_i = \frac{1}{2} \sum_{j=1}^m z'_{ijn} \quad (4.1)$$

where:

z'_{ijn} is the standardised value of the j -th feature in the i -th object, calculated using the formula (4.2):

$$z'_{ijn} = \frac{x_{ij} + \bar{x}_j}{s_j} \quad (4.2)$$

where n is the number of objects.

Considering the level of delimitation chosen for assessment, there were many problems associated with gathering data. These were mainly caused by the lack of relevant information in official statistics at the NUTS 5¹¹³ level, insufficient aggregation of sectors, and delays in the publication of data from general censuses. In consequence, the indicators had to be adjusted and adapted to the real possibilities of obtaining data.

¹¹³ Classification of territorial units according to the Council of Ministers Ordinance (Journal of Laws of 2000, No. 58, item 685). NTS 5 is the municipal level.

Table 4.1. Components of regional sustainable development in the Pila subregion

Environmental component	Operating environment	Use of water supply system (dm ³) per capita	
		Stocking density (SD) on 100 ha of arable land	
		Percentage of population served by municipal wastewater treatment plants	
		Percentage of homes with gas supply	
		Percentage of homes with central heating	
	Attractiveness	Ratio of forest land to total area	
		Rate of linkage to the general public	
		Number of tourists accommodated per 1000 inhabitants	
	Environmental protection	Ratio of national and landscape parks and nature reserves to total area	
		Expenditure on environmental protection to total expenditure	
		Average municipal budget expenditure on environmental protection per inhabitant in 2004-2006 (PLN)	
	Social component	Demographics	Proportion of working age population
Age dependency ratio (people)			
Feminisation rate (%)			
Factor attractiveness of migration per 1000 population			
Natural increase per 1000 population			
Education		Percentage of adult population with higher education	
		Average test result on completion of primary school (points)	
Social activity		Turnout in elections	
		Proportion of councillors with higher education	
		Library books per inhabitant	
		Average municipal budget expenditure on culture and protection of national heritage per inhabitant	
Living conditions		Percentage of homes in newly constructed buildings	
		Average municipal budget expenditure on social welfare per inhabitant	
		Proportion of people living on unearned sources of income	
		Percentage of population using water supply	
Economic component		Economic activity	Registered unemployment per 100 people of productive age
			Total number of farms per 100 hectares
			Number of individual farms per 100 hectares
	Employment rate (people of working age)		
	Employment among women (aged 17-60)		
	Agricultural sector	Percentage of individual farms over 1 ha producing mainly for the market	
		Percentage of farmers with higher education	
		Average total GR area	
	Finances of municipalities	Percentage of individual farms engaged in non-agricultural activities	
		Average municipal revenue per inhabitant	
		Average revenue from personal and corporate income tax per inhabitant	
		Funds for financing municipalities' tasks from other sources per inhabitant	
	Non-agricultural sector	Ratio of capital investment to total budget expenditure of municipalities	
		Percentage of non-agricultural sector employment in the service sectors	
	Spatial component	Level of urbanisation	
Density of road network			

Source: own compilation based on Boltromiuk (2011). The components were comprehensively analysed and assessed

The economic component

The economic component was described by 16 partial variables, aggregated into four subcomponents – agriculture (4 variables), non-agricultural (3 variables), economic activity (5 variables), and municipal finance (4 variables) – covering all aspects of the economic activity of the population in municipalities of the subregion. Agriculture was described by four variables, all of which are stimulants. The percentage of individual market-oriented farms of size larger than 1 ha showed the level of development of agriculture, while the percentage of users of individual farms with higher education reflected the level of human capital among farmers. The average area of a farm provided information on the degree of fragmentation of farms in the subregion, which of course also reflects their economic viability and survivability. The percentage of individual farms running non-agricultural businesses showed the willingness of farmers in the subregion to seek additional sources of income as well as the level of entrepreneurship in rural areas. Non-agricultural sector variables included the degree of servitisation of the economy, linked to the role of services in the local economy as well as the structure of employment in 2002. Another variable – private entities delivering public services to public entities providing such activities (education, health, social welfare) – showed the contribution of local entrepreneurs in providing more sophisticated services and their ability to initiate such projects. This variable also provides information about the level of unmet needs of the local community in terms of those services, as well as their awareness of specific organisational regulations and laws. The number of entities per 1000 residents showed the level of entrepreneurship and diversification of local farmers. Economic activity was measured by five variables, of which one – unemployment per 100 people of age 17-60 – was a destimulant. It was initially planned to calculate the percentage of people working in agriculture, but it was impossible to obtain information on the number of people employed in agriculture in 2010¹¹⁴. In consequence, this variable was replaced by the number of farms per 100 ha in total, complemented by a variable showing the number of individual farms per 100 ha. Both variables were necessary due to the relatively high proportion of farms with a legal form not allowing them to be classed as individual entities. The indicators reflected the economic activity of residents of the analysed municipalities, as a decreasing number of farms indicated improvement of the economic viability of the remaining ones, as well as an increase in the level of employment outside

¹¹⁴ Since 2005 data have been aggregated, with agriculture combined with forestry, hunting and fishing, which distorts the data on employment in agriculture itself. An analysis for the years 1992 and 2002 led to the conclusion that the number employed in agriculture per 100 ha decreased, and only in the case of cities an increase was recorded, due to the decrease in arable land and fairly stable numbers of people employed in agriculture.

agriculture. Another variable, the employment rate, showed the level of activity of the population of working age, and the last, employment among women, reflected how many professionally active women work in non-agricultural sectors, which is an important factor in the labour market especially in rural areas. The last group of variables describing the economic component – finances of municipalities – consisted of four variables, all of which are stimulants containing information on expenditure and revenue of local budgets. The first variable, average municipal revenue per inhabitant, illustrated the wealth of the analysed municipalities, while the second, average revenue from personal and corporate income tax per inhabitant, reflected the affluence of inhabitants. It should be noted that these variables do not reflect the situation of typical agricultural communities, because farms do not pay income tax. Funds for the financing of municipalities' tasks from other sources per inhabitant showed the effectiveness of local authorities in raising funds from sources other than the state budget to implement various tasks. This variable is especially important at the present time, when municipalities have the possibility of obtaining funds from the EU. The last of the variables describing this component – the ratio of capital investment to municipalities' total budget expenditure – reflected the role of investment for local authorities and their willingness to raise standards of living and meet the needs of the local community.

The social component

The social component was described by demographics (6 variables), education (3 variables), social activities (3 variables) and living conditions (11 variables). The greatest problems with obtaining data from official statistical collections throughout the entire period related to education. This is because data describing the educational level of citizens are only collected in censuses, and at the last census they were not aggregated at municipal level. It was also impossible to obtain data on the results of tests on completion of primary school for 1996, as this preceded the reform of the education system.

The first subcomponent was described by the percentage of population of working age, which reflected the proportion of the population of the municipality aged 18 to 59 years in the case of women and 18 to 64 in the case of men. This shows the proportional share of potential labour resources in society. It is complemented by the demographic load factor, which represents the non-working-age population per 100 people of working age. Thus, both groups are presented – the potential labour resources, and that part of the population which is not involved in the production of national income, but only in its division. Another indicator, the rate of feminisation (%), gives the ratio of women to men. Factor attractiveness of migration per 1000

population shows the areas of outflow and influx of people in relation to the flow of people changing their place of residence. The natural increase per 1000 people and the number of marriages per 100 people present demographic trends in the subregion as well as a population forecast. Education was described by three variables, illustrating the level of education of various age groups in society. The percentage of highly educated adults reflected the better-educated part of the population. Another variable, the percentage of children attending pre-school, showed the level of early schooling, which is very important in rural areas, as pre-school-age children there usually stay at home rather than take advantage of institutional education. The average test result on completion of primary school for the years 2002 and 2010 reflects the quality of education in primary schools in the subregion. The social activity of the adult population eligible to vote was described by the turnout in elections. The proportion of better educated councillors on the legislative bodies of municipalities illustrated the quality of the governing class in the subregion. Another variable – number of NGOs per 1000 population – shows the willingness of the local community to cooperate and associate into formal organisations. Unfortunately, this is not a perfect indicator, as it indicates only the number of registered organisations, not taking into account their actual operation or completed projects. The next variable, the number of events per 1000 population, measures the development of culture in the subregion. Budget expenditure on culture per capita shows how important cultural development is for the local authorities. Living conditions were described by a large number of variables, so this is an element which is measured in detail and most accurately. The first variable was library books per inhabitant, which describes how well the reading needs of inhabitants are met. The percentage of apartments in newly constructed buildings out of the total number of inhabited dwellings, assuming that new homes have better facilities and a higher standard than those in old buildings, reflects the increase in the standard of living and wealth of inhabitants. Average municipal budget expenditure on social welfare per inhabitant is a destimulant, indicating the level of welfare assistance provided to residents. Another destimulant in this subcomponent – the percentage of people living on benefits – indicates the proportional size of the non-working population. The next variable, UFA¹¹⁵ per person (m²), reflects the standard of living of the inhabitants of the subregion. The number of people per home is strongly connected with the previous variable and reflects the standard of living of society. Municipal investment per person illustrates the interest of local authorities in improving the quality of life, for example by maintaining greenery, order on the streets and lighting. The number of people per pharmacy reflects the community's overall access to medicines and

¹¹⁵ Usable floor area.

pharmaceutical advice. The last variable – the percentage of the population using the water supply system – indicates improvement in the living conditions of the population in the subregion.

The environmental component

The factor of attractiveness of the environment caused the most problems in measuring the environmental component, as there was no information available concerning the attractiveness of the subregion's terrain in the analysed period. The measurement was made using the classical model applied in such an analysis: pressure-state-response (PSR). The first variable – use of the water supply network (dm³) per capita – represented the pro-ecological attitudes of residents. Another – stock density per 100 ha of arable land – was a destimulant and showed the impact of agriculture on nature. The next variable – percentage of population served by municipal sewage treatment plants – measures the development of pro-environment infrastructure, including both sewage treatment plants and the connected sewage system. The length of operational sewerage in m² per person shows the condition of the waste disposal infrastructure and the length of the network connected to sewage treatment plants, thus it is a variable complementary to the previous one. The percentage of homes with central heating reflects the standard of living, while the percentage of homes equipped with gas heating is a complementary variable to the previous one and reflects the ecological attitude of inhabitants of the subregion. On the other hand, it may also indicate the wealth of the inhabitants, since gas heating would appear to be a more expensive but also a convenient solution. Data on air pollution proved to be extremely difficult to obtain. Overall dust and gas emissions were analysed; however, the availability of data for only some cities and major differences in values between years resulted in the abandonment of this variable in further analyses. The attractiveness of the environment was described by such indicators as the ratio of forests to total area, which indicates areas of dense forests that are disadvantageous for agricultural use. The contribution of permanent grassland to total agricultural land pointed to the intensity of agricultural land use. The last variable describing this component – number of tourists accommodated per 1000 inhabitants – reflects tourist attractions in the subregion, as well as the development of tourism infrastructure in municipalities. Unfortunately, data were available only for nine municipalities, and so a comprehensive assessment of this factor was impossible. Environmental protection was described by such variables as the ratio of national parks and nature reserves to total area, reflecting the policy concerning the protection of the surface of the subregion. The ratio of expenditure on environmental protection to overall expenditure, and average municipal budget expenditure on environmental protection

per inhabitant, are variables reflecting the importance of environmental protection for the local government, as well as directions of disbursement of the budget related to the implementation of EU projects.

The spatial component

The spatial component was described by two variables¹¹⁶ – the ratio of urban to rural population, indicating the level of urbanisation of the subregion, and road network density, determined by the ratio of the length of municipal roads to the area of the municipality.

Levels of components

Each component separately, as well as the synthetic indicator of sustainable development, were examined for each of the rural municipalities of the subregion in the three analysed periods – the pre-accession period (1996 and 2002) and post-accession period (2010). The same variables and measurement methods were adopted, which ensured a full comparability of the sustainability of development in the municipalities of the subregion in the entire analysed period. The component values for 1996 are presented in the table 4.2.

Table 4.2. Component indicators in 1996

Municipality	Environmental component	Social component	Economic component	Spatial component	Synthetic indicator
Pila subregion	0.42	0.22	0.26	0.31	0.30
Budzyń	0.32	-0.04	0.12	1.31	0.43
Chodzież	-0.19	-0.14	0.07	-0.37	-0.16
Margonin	0.76	0.10	0.35	0.14	0.34
Szamocin	0.27	0.26	0.20	0.33	0.27
Czarnków	-0.41	-0.28	-0.47	1.66	0.13
Drawsko	0.65	-0.17	-0.08	1.00	0.35
Krzyż Wielkopolski	0.49	0.07	0.41	0.53	0.38
Lubasz	-0.33	0.17	0.43	-0.58	-0.08
Połajewo	-0.36	-0.13	-0.42	-0.51	-0.36
Trzcianka	0.82	0.56	0.41	0.49	0.57
Wieleń	-0.21	-0.23	0.00	0.15	-0.07
Białośliwie	0.29	0.18	0.12	-0.56	0.00
Kaczory	0.73	0.03	0.06	-0.59	0.06
Łobżenica	-0.02	0.05	-0.03	0.00	0.00
Miasteczko Krajeńskie	-0.02	0.36	-0.22	-0.58	-0.12
Szydłowo	-0.11	-0.40	-0.20	-0.58	-0.32
Ujście	0.07	-0.15	0.60	0.19	0.18

¹¹⁶ Unfortunately it was not possible to obtain data on, among others, railway network density, GDP per capita, or, for example, parameters related to innovation.

Table 4.2. cont.

Municipality	Environmental component	Social component	Economic component	Spatial component	Synthetic indicator
Wyrzysk	-0.31	0.00	0.03	0.06	-0.05
Wysoka	-0.16	-0.14	-0.14	0.01	-0.11
Damaśławek	-0.52	-0.15	0.39	-0.51	-0.20
Gołańcz	-0.20	0.04	-0.01	0.96	0.20
Mieścisko	0.04	0.07	-0.15	-0.55	-0.15
Skoki	-0.02	-0.09	0.32	0.13	0.08
Wąpno	-0.52	0.02	-0.19	-0.36	-0.26
Wągrowiec	-0.67	-0.52	-0.30	-0.55	-0.51
Jastrowie	0.00	0.04	0.25	0.52	0.20
Krajenka	-0.22	0.19	-0.30	0.21	-0.03
Lipka	-0.33	-0.15	-0.26	-0.58	-0.33
Okonek	-0.09	-0.03	-0.20	0.07	-0.06
Tarnówka	0.26	-0.32	-0.42	-0.60	-0.27
Zakrzewo	-0.04	0.09	-0.39	-0.57	-0.23
Złotów	-0.54	-0.29	-0.36	-0.58	-0.44

Source: Own calculations based on Central Statistical Office data (Local Data Bank)

As can be seen from the above table, in 1996 the Trzcianka municipality turned out to have the highest values for the environmental and social components. Expenditure on environmental protection per capita was very high in this municipality, and the development of infrastructure and forest cover were also higher than in other parts of the subregion. In terms of the economic component the highest level was recorded in Ujście, distinguished by a high level of entrepreneurship, employment, and income levels from personal and corporate income tax.

Table 4.3. Component indicators in 2002

Municipality	Environmental component	Social component	Economic component	Spatial component	Synthetic indicator
Pila subregion	0.07	-0.05	0.31	0.12	0.11
Budzyń	0.06	0.05	0.25	1.38	0.44
Chodzież	0.53	0.18	-0.01	-0.41	0.07
Margonin	0.37	0.07	0.02	-0.03	0.11
Szamocin	0.14	-0.34	-0.16	0.16	-0.05
Czarnków	-0.41	-0.03	0.10	1.75	0.35
Drawsko	-0.08	-0.06	-0.39	0.69	0.04
Krzyż Wielkopolski	0.28	0.02	-0.06	0.28	0.13
Lubasz	-0.20	-0.16	0.10	-0.62	-0.22
Połajewo	-0.05	0.45	-0.36	-0.56	-0.13
Trzcianka	-0.06	0.12	-0.03	0.27	0.08
Wieleń	-0.27	0.00	-0.08	-0.02	-0.09
Białośliwie	-0.07	0.24	-0.02	-0.61	-0.12
Kaczory	0.60	-0.06	0.03	-0.64	-0.02

Table 4.3. cont.

Municipality	Environmental component	Social component	Economic component	Spatial component	Synthetic indicator
Łobżenica	0.12	0.22	0.06	-0.12	0.07
Miasteczko Krajeńskie	-0.44	0.02	-0.43	-0.63	-0.37
Szydłowo	0.13	0.26	-0.21	-0.62	-0.11
Ujście	0.49	0.28	-0.05	0.01	0.19
Wyrzysk	-0.06	-0.44	-0.04	-0.07	-0.15
Wysoka	0.27	0.08	-0.23	-0.12	0.00
Damasławek	-0.23	-0.12	-0.05	-0.56	-0.24
Gołańcz	-0.07	-0.08	0.03	0.66	0.14
Mieścisko	0.03	-0.11	-0.10	-0.59	-0.19
Skoki	0.09	-0.14	0.26	0.01	0.05
Wapno	-0.12	-0.45	0.07	-0.40	-0.23
Wągrowiec	-0.72	0.25	-0.13	-0.59	-0.30
Jastrowie	-0.16	0.19	-0.21	0.28	0.02
Krajenka	0.13	-0.14	-0.33	0.01	-0.09
Lipka	-0.36	-0.11	-0.25	-0.63	-0.34
Okonek	-0.37	-0.23	-0.34	-0.09	-0.26
Tarnówka	0.67	-0.13	-0.44	-0.65	-0.14
Zakrzewo	0.03	0.01	-0.20	-0.61	-0.19
Złotów	-0.44	0.01	-0.40	-0.63	-0.36

Source: Own calculations based on Central Statistical Office data (Local Data Bank)

The table above shows indicator values in 2002. The highest values for the environmental component were recorded for Tarnówka (with a value nine times higher than in the subregion as a whole), where low stocking density (SD) on 100 ha of arable land, a well-developed infrastructure network and a high proportion of protected areas were recorded. For the social component the highest value was obtained by Połajewo (almost 10 times greater than the average), with a high percentage of children aged up to 6 years attending pre-school, and a relatively low municipal budget expenditure on welfare. In terms of the economic component, the highest values were recorded in Budzyn and Skoki, both of which had high rates of entrepreneurship.

Table 4.4. Component indicators in 2010

Municipality	Environmental component	Social component	Economic component	Spatial component	Synthetic indicator
Pila subregion	-0.01	-0.06	0.10	0.11	0.03
Budzyń	0.86	-0.10	0.43	1.38	0.64
Chodzież	0.22	0.27	0.16	-0.41	0.06
Margonin	0.70	0.35	0.42	-0.03	0.36
Szamocin	0.15	0.04	0.09	0.15	0.11
Czarnków	-0.21	-0.26	-0.40	1.75	0.22

Table 4.4. cont.

Municipality	Environmental component	Social component	Economic component	Spatial component	Synthetic indicator
Drawsko	-0.18	-0.03	-0.18	0.69	0.08
Krzyż Wielkopolski	0.11	-0.22	-0.31	0.27	-0.04
Lubasz	-0.22	0.22	0.30	-0.62	-0.08
Połajewo	-0.13	-0.20	-0.37	-0.56	-0.31
Trzcianka	-0.15	0.04	-0.07	0.27	0.02
Wieleń	-0.22	-0.12	-0.24	-0.03	-0.15
Białośliwie	-0.29	0.30	-0.31	-0.61	-0.23
Kaczory	0.54	0.13	-0.10	-0.64	-0.02
Łobżenica	-0.25	-0.38	-0.06	-0.13	-0.20
Miasteczko Krajeńskie	-0.39	0.38	-0.42	-0.63	-0.26
Szydłowo	0.60	-0.13	0.24	-0.62	0.02
Ujście	0.01	-0.27	-0.05	0.01	-0.08
Wyrzysk	-0.26	-0.27	-0.26	-0.07	-0.22
Wysoka	-0.09	-0.39	-0.43	-0.11	-0.25
Damasławek	-0.14	0.07	-0.16	-0.56	-0.20
Gołańcz	0.06	0.06	0.13	0.66	0.23
Mieścisko	-0.54	-0.17	-0.18	-0.59	-0.37
Skoki	-0.47	-0.16	0.23	0.02	-0.10
Wąpno	-0.15	-0.17	-0.24	-0.40	-0.24
Wągrowiec	-0.29	-0.22	-0.07	-0.59	-0.29
Jastrowie	-0.30	-0.05	-0.44	0.28	-0.05
Krajenka	0.57	0.04	-0.30	0.00	0.23
Lipka	-0.50	-0.10	-0.19	-0.63	-0.35
Okonek	0.00	-0.08	-0.20	-0.06	0.01
Tarnówka	-0.23	-0.23	-0.26	-0.65	-0.34
Zakrzewo	0.09	0.11	-0.29	-0.61	-0.18
Złotów	-0.57	-0.23	-0.05	-0.63	-0.37

Source: Own calculations based on Central Statistical Office data (Local Data Bank)

In the final year of analysis, in terms of the environmental and economic components, the highest values were recorded in the municipality of Budzyn, which had an outstanding network infrastructure, a high level of municipal investment, a high ratio of private to public entities, a high level of entrepreneurship and high budget income from personal and corporate income tax. In terms of the social component the highest values were obtained by Miasteczko Krajeńskie, which was characterised by a relatively high birth rate and the highest number of marriages.

Conclusions

Based on the results of the methodology described above for evaluating regional sustainable development, maps were prepared showing the units with the highest and lowest values of the indicator.

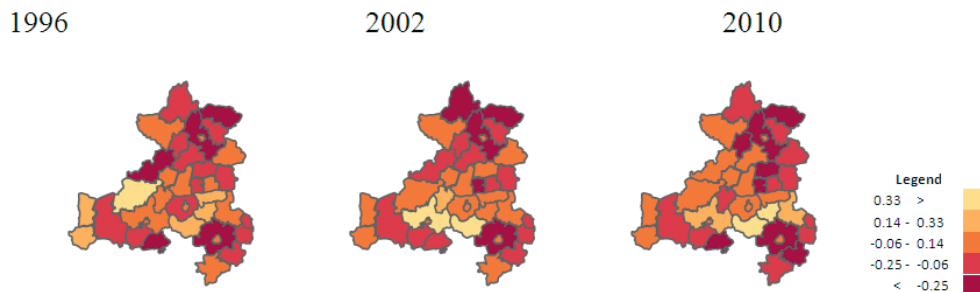


Figure 3.6. Synthetic indicator values in 1996, 2002 and 2010

Source: Own calculations based on Central Statistical Office data (Local Data Bank)

To conclude, throughout the entire period municipalities in the northern and south-eastern parts of the Pila subregion were described by lower values. On the other hand, stable high values of the synthetic indicator were recorded in the southern parts of the subregion (the municipalities of the Chodzież powiat) and in the north in the municipalities of the Czarnków-Trzcianka powiat. The methodology enables not only an assessment of sustainability, but also a comparison of synthetic indicators in the entire analysed period. The observed relationships are largely consistent with the diversity of the educational region Pila (Polcyn 2014).

4.2. Human capital in agribusiness as a factor in sustainable development – problems of measurement in the case of firms in the agri-food sector

(Firlej Krzysztof, Karolina Palimąka, Mateusz Mierzejewski¹¹⁷)

The historical context

The European Council summit of May 2000 set out directions to be taken in the continued development of a united Europe. This development would be based on a more effective use of human resources. This was a decision influenced by the significant advantage in economic development enjoyed by the United States, whose economy was based to a large extent on using human resources more effectively. Differences in development also resulted from such factors as the faster ageing of the European population (in 2000 the percentage of the EU's population being of productive age was 66%, compared to around 75% in the United States (Niklewicz 2011) and the divergence in the quality of intellectual capital (the proportion of graduates in the United States was approximately 17% higher). The concept of long-term economic development that resulted from the actions of the European Council moved the main emphasis to human capital understood in a variety of ways, innovations and inventions, and not to savings which might determine paths of further progress.

However, the objectives of the Council's original concept were not realised, partly due to the weakness of political leadership, polarisation of the interests of member states, and the excessive number of goals and priorities together with the low level of responsibility assigned to individual members of the community. Another problem was the absence of appropriate overall indicators serving the implementation of certain measures, such as GDP per capita based on PPP, labour productivity, rate of employment, rate of employment of older persons, R&D spending as % of GDP, etc.

In response to the ineffectiveness of the Lisbon concept, social consultation was carried out in 2009-2010, which led to the formulation of the Europe 2020 strategy, which is based on three priorities (European Commission 2010b):

- intelligent growth – based on education, innovation and scientific research;
- sustainable growth – movement to a low-emissions economy;
- inclusive growth – linked to poverty reduction and job creation.

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Based on the agreed priorities, the final objective is to achieve five goals relating to employment, innovation, education, poverty reduction, climate and energy, being directly linked to the improvement of the competitiveness of the economy as a whole (European Commission).

Agriculture and the knowledge-based economy

Agricultural enterprises make up a sector which is most often associated with traditional forms of enterprise based on the three basic factors: land, capital and labour. At present, those enterprises are subject to pressure to introduce innovative production methods and new practices. The tasks most commonly set for agriculture include seeking new sources of means of production, the implementation of innovative production technologies, the establishment of contacts with new markets, and reorganisation of the sector's related industry (Wójcik 2011). In the case of Polish agriculture, attention is also drawn to the important role played by the process of creative destruction which generates new solutions and structures (Schumpeter 1960), posing a difficult challenge to an agricultural system which is fragmented, lacks efficiency (Poczta, Mrówczyńska-Kamińska 2008) and is characterised by a relatively low level of education (Kozera 2011) (that is, human capital). Significant in this context is not only the level of education but also its quality (Hnatyszyn-Dzikowska, Polcyn 2015).

In academic work relating to consulting in the agricultural sector, five categories of farmers are identified (Kania, Drygas, Kutkowska, Kalinowski 2011): innovators (approximately 2.5% of the population), pioneers or early imitators (13.5%), the early majority (34%), the late majority (34%) and latecomers (16%). The division between these types reflects the difficulties with the transfer and acquisition of knowledge in agriculture. Knowledge is expected to lead to the development of communities, their economies and enterprises, and knowledge resources combined with creativity, efficient innovative processes and a "culture of innovation" provide conditions for a measurable increase in their competitiveness (Firlej, Żmija 2014). The market economy has begun to force farmers and firms in the agricultural and food sector to operate according to new rules, where key importance is attached to such economic categories as competition, efficiency and profit (Firlej, Rydz 2012). This issue is related to the concept of a knowledge-based economy, since the proper management of innovation, as well as the speed of diffusion of knowledge in the sector (correlated with the strength of links between its component entities), testifies to agriculture's state of economic advancement.

The results of research carried out in Poland in 2011 by K. Firlej led to several conclusions about the situation as regards the use of knowledge, which, although it

is starting to become a determinant of the development of firms in the food industry, is often not utilised to the planned extent. It should be noted that the respondents regard knowledge management as a positive contributor to the functioning of firms in conditions of a market economy, which strengthens their competitiveness and helps to modernise their system of management. A survey of companies engaged in the production and distribution of food products, included in the WIG-Food stock market index, showed that (Firlej, Żmija 2014):

1. knowledge, information and their quality and currency are factors that strengthen firms' success, expressed in improved competitiveness and market position;
2. the use of computerised methods in a firms' everyday operations helps to utilise qualifications and skills and manage the firm's capital in an organised manner;
3. intellectual capital and corporate governance should be treated as significant contributors to the value of a firm (since a properly constructed and functioning system of corporate governance can ensure properly directed development prospects for the capital market, which will bring about development of the economy as a whole (Firlej 2011);
4. in the building of firms' competitiveness, it must be seen as essential to provide management of the organisational climate and culture and the important role of the organisation's social responsibility (Firlej 2008).

Intellectual capital has been called the "wealth of an organisation" (Stewart 1997, Sveiby 1997) or the "organisation's treasure" (Dzinkowski 1999) and is perceived as a factor driving the global economy of the future and at the same time a key to success in the 21st century. Pioneers in defining the concept of human capital include T.W. Schultz, G.S. Becker and J. Mincer, while in the case of intellectual capital a key figure is K.E. Sveiby, who in 1987, as part of the "Konrad group", attempted to define intellectual capital and develop methods for measuring it. Reviewing the successively modified concepts of intellectual capital, we may generalise by stating that it refers to hidden assets of a firm, not shown on the balance sheet, representing the acquired knowledge of members of the organisation that is used to create valuable and unique relations. Intellectual capital combined with financial capital in fact creates a firm's market value. It includes such components as human capital, structural capital, social capital and relationship capital.

In Skrzypek's approach, intellectual capital combines three groups of resources:

1. customer capital, the customer base, relations with customers, customer potential;
2. organisational capital, process capital, culture and innovativeness;
3. human capital, starting value, relationship value, value of potential.

Intellectual capital is a source of competence, intelligent vigour, strength, wealth, competition, efficiency, effectiveness and productivity, which in the conditions of the knowledge society represents a significant opportunity for a firm to achieve success (Skrzypek 2007).

It must be regarded as a matter of particular importance to examine the intellectual capital of a firm, with regard to both the transformations taking place in organisations, and the identification of the intangible assets of individual entities. Many methods of measuring intellectual capital have been proposed in the literature, and these, according to Karl-Erik Sveiby for example, can be divided into four groups (Sveiby 2010):

1. Market capitalisation methods (MCM), which involve the computation of the difference between a firm's market value and the book value, such as Market-To-Book Value, Tobin's q index.
2. Return on assets methods (ROA), where the average pre-tax profits for a period are divided by the average value of a firm's tangible assets in the same period. The resulting ROA value is compared with the average for the sector. The difference, multiplied by the average value of tangible assets, gives the value of average annual profit from intangible assets. The total intellectual capital is obtained by discounting this value by the firm's average cost of capital or a similar discount rate. Methods of this type include Economic Value Added (EVA™) and Calculated Intangible Value.
3. Direct intellectual capital methods (DIC), which enable the identification of components of intellectual capital and the estimation of their monetary value. Such methods include Human Resource Costing and Accounting (HRCA), and the Dynamic Monetary Model.
4. Scorecard methods (SC), which enable the identification and measurement of individual components of intangible assets or intellectual capital using non-monetary indicators. They include the Skandia Navigator, IC Rating™ and Intellectual Capital Statements.

Selected market capitalisation methods

Market capitalisation methods allow one to determine whether there is a difference between the book value and the market value of a given firm. The value of a firm's intellectual capital is identified with that difference (Dobija 2003). The market value is the true value of a firm, and hence by comparing it with the book value one may establish whether the market considers its real value to be higher or lower than the latter.

The MV/BV method

This index-based method was proposed by T. Stewart (1997), who adopted the assumption that a firm's intellectual capital is the difference between its valuation by the market and its book value (Jarugowa, Fijałkowska, 2002). A key assumption is the assertion that a firm's market value is the sum of its book value and the value of its intellectual capital (Nita 2013). The next stage of measurement under this method involves comparing these two values, making it possible to determine the part of the book value that represents the real value of a firm. It should be noted that this indicator does not give a concrete value for a firm's intellectual capital, but provides information as to whether or not a given firm possesses intellectual capital (Hofman, 2011). The market value used in this method may be calculated in two ways (Kasiewicz, Rogowski, Kicińska, 2006):

1. For stock market listed companies, their value is the number of traded shares multiplied by their current value (or average value for a given period).
2. In other cases the market value is computed by a comparative method, involving calculation of the value of a listed company with similar results and profile of operations.

To compute the indicator MV/BV it is also necessary to determine a firm's book value, namely the book value of its net assets, obtained by subtracting the book value of outside capital from the firm's total assets. The value of outside capital is computed as the sum of long-term and short-term liabilities, provisions, accruals and deferred income (Kasiewicz, Rogowski, Kicińska, 2006). Another possible way of determining a firm's book value is by identifying it with the value of the firm's equity.

The MV/BV model thus takes the following form:

$$\frac{MV}{BV} = \frac{\text{share price} \times \text{no. of shares}}{\text{assets} - \text{outside capital}} \quad (4.3)$$

From the point of view of the concept of intellectual capital, an indicator value greater than 1 may be interpreted as showing that the accounting books fail to record certain assets that may increase the firm's real value (Kasiewicz, Rogowski, Kicińska, 2006). The result therefore indicates the presence (or in the case of a value less than 1, the absence) of intellectual capital in the firm (Hofman, 2011). Assuming that the difference between the market and the book value is dependent on this intellectual capital, the value of the indicator enables one to identify a situation in which a firm is making use of intellectual capital in its operations (Urbanek, 2008).

This measure is easy to interpret and facilitates the observation of changes taking place in the market (Urbanek, 2008); however, with regard to difficulties in

determining the particular values required for its computation, it is recommended for use only when analysing stock market listed companies (Urbanek, 2008).

Criticism of the MV/BV indicator focuses on three points. The first is the identification of the value of intellectual capital with the difference between book value and market value (Nita, 2013). It is pointed out that intellectual capital is something more than an excess of value. If that were not the case, then the value of intellectual capital would be a consequence of the applied accounting policy (Kasiewicz, Rogowski, Kicińska, 2006). A further objection is that the method ignores factors such as seasonal variation, speculation and so forth, which have an impact on a firm's market value (Jarugowa, Fijałkowska, 2002). Finally, criticism is directed at the methodology itself, in which a comparison is made between *ex post* values (book values) and *ex ante* values (stock market predictions), which casts doubt on the representativeness of this method (Palimąka, Gumieniak, 2014).

Tobin's q index

This index was developed in 1969 by the Nobel prizewinning economist J. Tobin (Sopińska, 2010), who wished to create a tool to make it easier to take investment decisions independently of macroeconomic values (Sopińska, 2010). Tobin's q is the ratio of the market value to the replacement cost of tangible assets (Jarugowa, Fijałkowska, 2002). One of the methods of calculating this index is the model of K. Cung and S. Pruitt, which defines the market value as the sum of the components of the firm (market value of ordinary shares, book value of preference shares, book value of long- and short-term liabilities, book value of inventories) less the book value of current assets. According to this approach, Tobin's q is given by the following formula:

$$Tobin's\ q = \frac{MVCS + BVPS + BVLTD + BVINV + BVCL - BVCA}{BVTA}, \quad (4.4)$$

where:

MVCS is the market value of ordinary shares;

BVPS is the book value of preference shares;

BVLTD is the book value of long-term liabilities;

BVINV is the book value of inventories;

BVCL is the book value of current liabilities;

BVCA is the book value of current assets;

BVTA is the book value of total assets (Kasiewicz, Rogowski, Kicińska, 2006).

The authors take the replacement cost of tangible assets (which theoretically should be closer to the market value) to be the equivalent of the total book value of

assets (Kasiewicz, Rogowski, Kicińska, 2006). As in the case of the MV/BV method, in view of its simplicity and comprehensibility, this indicator is commonly used to value intellectual capital (although this is not its only application). A value greater than 1 is interpreted as meaning that the firm has a higher than average return on investment, generating higher profits, this being explained by the fact that appropriate use is being made of intellectual capital (Kasiewicz, Rogowski, Kicińska, 2006).

Despite the application of the replacement cost of fixed assets and the closeness of the value of the indicator to market quantities, some significant issues related to the q methodology remain unresolved. As in the market-to-book value case, Tobin's q index is dependent on the market value, and despite the levelling of differences between the two forms of value (book and market), the values obtained may still not reflect the actual values of intangible assets (Kasiewicz, Rogowski, Kicińska, 2006). As with the MV/BV method, Tobin's q may be used to monitor changes in the values of intellectual capital in a firm over a number of years (Jarugowa, Fijałkowska, 2002). It is also possible to compare the results of firms in the same sector having similar tangible assets (Urbanek, 2008).

Tobin's indicator is based on the assumption that a company's intellectual capital is expressed as the difference between its market value and its book value (in this case the replacement value of the firm's assets, which is closer to the market value). It is simple to calculate, widely used, and in a certain sense objective, but it is too simplified for the results obtained to be regarded as a reliable measure of the value of intellectual capital. This does not change the fact that it helps direct the view taken of a firm, for instance by investors. Tobin's q is an index-based method, hence an interpretation of the result allows one only to state whether a given firm makes effective use of its intangible assets, and to identify whether a firm is capable of generating above-average profits (Jarugowa, Fijałkowska, 2002).

Selected return on assets methods

In return on assets (ROA) methods, average pre-tax profits are compared with the average value of the firm's tangible assets, and the index is then compared with the average return on assets in the sector in which the firm operates (Pilková at all, 2013). The difference is then multiplied by the average value of tangible assets, returning a value claimed to represent the average annual profit from intangible assets (Pilková at all, 2013). Finally, that value is discounted by the average cost of capital or rate of interest, to produce a result representing the firm's intangible assets or, equivalently, intellectual capital. Such methods are based on the theory that a firm's profits or losses are dependent on the existence of intellectual capital within

the enterprise, even though it does not appear in its financial statements (Pilková at all, 2013).

The EVA™ method

The roots of the EVA™ method go back to the late 19th century, when A. Marshall and others wrote about a concept that later came to be called the residual profit (Nita 2007). It is on this method that the whole concept of economic value added is based. The residual profit differs from the book profit in that it takes account of not only the cost of outside capital, but also the cost of equity (Nita 2007). In the EVA™ method this is achieved by, among other things, applying the weighted average cost of capital (WACC).

The EVA™ method is a product of the New York consulting firm Stern Stewart & Co. It was proposed just over 20 years ago (in 1994) by one of the founders of that company, G. B. Stewart, and is an extension of the concept of residual profit (Nita 2007). Economic value added is based on the assumption that added value exists when the rate of return on capital exceeds its cost (Sopińska, 2010). It is used to determine the value of a firm, and owes its place in the literature on measuring intellectual capital (Kasiewicz, Rogowski, Kicińska, 2006) to its use in identifying the effective (or ineffective) utilisation of intellectual capital in a firm (Frączek, 2012).

The EVA™ model is viewed very favourably by economists as a tool for calculating a firm's added value, but not so positively when applied as a method for calculating intellectual capital or possible changes therein. According to P. Stressmann, a proponent of the use of this indicator to find the value of intellectual capital, obtaining a capital surplus following the satisfaction of certain claims of the providers of capital, as the residual value was defined by Stressmann (Urbanek, 2008), must be an effect of the positive use of the firm's intellectual capital, in view of the theory that "no system may output more than it received as inputs" (Urbanek, 2008). Stressmann estimates the value of intellectual capital (knowledge) by means of the ratio of the EVA value to the cost of capital of knowledge, which he compares with the rate of interest on the firm's long-term debts (Urbanek, 2008).

Many authors dispute this approach, arguing, among other things, that the EVA surplus may also to some degree be generated by tangible assets. Reference is also made to the fact that, as in the case of market capitalisation methods, book values are used in the determination of a future value (the value of intellectual capital is a kind of indeterminate future value, or at least not a past value, as in the case of at least those appearing on the balance sheet).

EVA, traditionally understood, is the operating profit after tax minus the product of capital invested and the weighted average cost of capital, as given by the following formula (Dobija, 2003):

$$EVA = NOPAT - IC * WACC \quad (4.5)$$

The value NOPAT represents the profit actually attained by investors, which may be calculated as the product of the capital employed in the business and its rate of return (ROI); it is insensitive to decisions concerning the financing of assets, and reacts to operational factors (Nita, 2007).

In the literature on issues relating to human capital, the above formula has been “adopted” for the process of “management of value through human capital” (Dobija, 2003) and takes on various forms. Nonetheless, the EVA formula found most frequently in the literature relating to intellectual capital is a model that takes account of the value of capital invested, the rate of return on invested capital and the weighted average cost of capital (Kasiewicz, Rogowski, Kicińska, 2006).

Based on the literature, it may be concluded that the only advantage of the EVATM method as an indicator of the value of intellectual capital is its strong link to the market value of a firm, while its main fault is that it fails to cover a wide range of intangible assets (Kasiewicz, Rogowski, Kicińska, 2006). EVATM was developed for the determination of the value of a firm, and for this reason it is considered defective as a means of measuring intellectual capital. When one views a firm in terms of value added and the value of shares, one overlooks factors which are very important from the standpoint of intellectual capital, such as employee productivity, customer satisfaction and financial market reputation (Palimąka, Gumieniak, 2014).

In summary, when classified as a tool for measuring the presence of intellectual capital in a firm, this method fulfils its task only in terms of certain fundamental assumptions, including that a firm’s value added is the result of the possession and effective utilisation of only that one intangible component of assets.

The EVATM model is most often used in practice to reflect a company’s value added from the perspective of its perception by shareholders. This will not have a direct link with intellectual capital (Iazzolino, Laise 2013), although one cannot entirely exclude the possibility that this result has some influence on the management of intellectual capital.

The CIV method

In the CIV (Calculated Intangible Value) method, rather than analysing the market value, account is taken of the return on assets (ROA) (Fijałkowska, 2012). The CIV model is based on the assumption that the value of a firm’s intellectual capital corresponds to its ability to outperform an average competitor having similar

material assets and operating in the same sector (Fijałkowska, 2012). This method was first used for tax purposes, namely in determining the market value of a firm's intangible assets (Kasiewicz, Rogowski, Kicińska, 2006). The model was developed by NCI Research in the 1930s, at the time of prohibition in the United States (for the calculation of values of intangible assets lost as a result of that measure) (Sopińska, 2010). It was intended to be useful for firms wishing to obtain outside financing (credit, loans) and having operations based to a significant degree on knowledge (Urbanek, 2008). Other sources claim that the method was initiated by the Internal Revenue Service (IRS), whose ruling 68-609 (with certain adjustments) is still in effect today (Dobija, 2003).

In 1995, for the purpose of measuring intellectual capital, T.A. Stewart modified the existing CIV method, and since that time a seven-step method has been used to determine the approximate value of a firm's intellectual capital. The principal dependent value in the model is the ROA for the firm and for the sector in which it operates. If the firm's ROA exceeds that of the sector, it is concluded that the firm possesses intellectual capital (Kasiewicz, Rogowski, Kicińska, 2006). The converse result is interpreted as meaning that the firm makes poorer use of intellectual capital than its competitors.

The result obtained by seven computational steps defines the value of the intangible assets possessed by the firm (understood as intellectual capital), enables managers to compare the firm with its competitors, and provides information as to whether investments in intangible assets are profitable for the firm (Dobija, 2003).

The CIV methodology is based on a series of seven steps, which give a final result called the intellectual premium. In the first step the average pre-tax profit for the past three (or five) years of the firm's operations is computed (Nita, 2013). Next, based on the balance sheet, the average value of tangible assets is determined for the same period (Sopińska, 2010). The third step involves calculating the average ROA for the analysed period, being the quotient of the previous two values – the ratio of the average gross profit to the average value of assets (Kasiewicz, Rogowski, Kicińska, 2006). At the next stage the average ROA is calculated for the sector in which the firm operates (again for a period of three or five years) (Nita, 2013). In the fifth step the "excess return" is calculated, by subtracting the product of the results obtained at the third and fourth stages from the average pre-tax profit (Kasiewicz, Rogowski, Kicińska, 2006). The next step is the calculation of the intellectual premium, namely the profit on intangible assets. For this purpose the average rate of taxation in the analysed period is computed, and this is then multiplied by the result from stage five, namely the excess return (Sopińska, 2010). The amount of the premium is the difference between the excess and the result obtained at this stage (Nita, 2013). In the last step, the present value of the computed premium is determined by dividing it

by an appropriate discount rate (Sopińska, 2010). The discount rate applied may be the cost of capital for the firm in question (Nita, 2013).

The “intellectual premium” obtained at the last stage reflects the average profit obtained thanks to the firm’s possession of intellectual capital, relative to its competitors in the same sector (Nita, 2013). The value is interpreted as an answer to the question of how much the firm would gain thanks to the intellectual capital that it possesses (relative to firms in the sector) (Kasiewicz, Rogowski, Kicińska, 2006). An increasing value of the indicator shows that the firm is increasingly capable of creating future intangible profits, whereas a decreasing value implies the ineffective use of intellectual capital through investment in tangible assets (Urbanek, 2008).

The required values are taken from the firm’s financial statements for the three (or five) preceding years, as well as from capital market data (the average rate of return on assets in the sector) (Sopińska, 2010), and it is this availability of data that is considered the main advantage of the CIV model. It may be used to compare competing firms, and hence is an effective benchmarking tool; however, when comparisons are made it must be borne in mind that, for example, every firm has a different investment cycle. Such differences can affect the final result, and hence it must be remembered that a smaller value does not always imply poorer utilisation of intellectual capital, but may be a signal that the firm has embarked on a costly investment programme (Urbanek, 2008).

A significant problem when measuring the value of intangible assets is that expenditure on such assets is recorded as a cost, thus diminishing the firm’s profit – this contradicts the assumption that company income rises thanks to the utilisation of intangible assets (Urbanek, 2008). It should be noted that the method under discussion has two significant weaknesses. The first is the use of averaged values, which distort the resulting picture of capital, while the second is basing the present value on the discounting of the “intellectual premium” by the firm’s cost of capital. Hence it is necessary to use the cost of capital in a particular industry in order to level the resulting difference, and this again involves averaged values (Jarugowa, Fijałkowska, 2002).

In summary, CIV is often regarded as one of the methods that best reflects firms’ intellectual capital (Fijałkowska, 2012). The seven-step calculation provides the value of the “intellectual premium” identified with intangible assets or intellectual capital. Despite the fact that, because of averaging, the final value is not as precise as the values of individual components on the balance sheet, the method provides a simple way of obtaining a value for a firm’s intellectual capital (Sopińska, 2010). It is also significant that the CIV model is based on easily accessible data (not requiring “digging” within the firm itself).

The case of KSG Agro SA, Industrial Milk Company SA and Kernel Holding SA – characteristics of the companies

To illustrate the possibilities of applying the described methods, three companies from the agricultural and food sector were selected, each of which is included in the Warsaw Stock Exchange's WIG-Food index.

KSG Agro SA is a Luxembourg-based group of businesses operating in the agribusiness sector, engaged principally in the production of grains (maize, wheat, barley, soya, rape) and vegetables, and in supplying food products to retail chains. KSG Agro SA is the fastest expanding agricultural company in Ukraine, and its chief strategic goal is to reinforce its leading position in the market and to develop its operations through innovative solutions, so as to become the largest vertically integrated holding company in central Ukraine. The company operates in almost every segment of the agricultural market, including production, warehousing, processing and sale of agricultural products. In 2015 its assets included 94,000 hectares of cultivated land (www.ksgagro.com/Po/). It has been listed on the Warsaw Stock Exchange since May 2011.

The second company, the Luxembourg-based Industrial Milk Company SA, also operates in Ukraine. It is an agricultural firm, whose chief areas of activity are concentrated on grains, oil-bearing plants and potatoes (cultivation, storage and processing) as well as dairy farming. It is one of Ukraine's largest milk producers, and one of the country's ten largest agricultural firms. In 2014 the company harvested crops from 136,700 hectares of land (www.imcagro.com.ua). It began operating in 2007, and has been listed on the Warsaw Stock Exchange since May 2011.

The last of the three, the Luxembourg-based Kernel Holding SA, is another Ukrainian holding company. Like the first two companies, Kernel Holding SA operates on the food market in the agribusiness sector. Its operations date back to 1995; it became Kernel Holding SA in 2005, and is now among the largest companies in the agricultural sector in Ukraine. Its main lines of business include the production and export of bottled sunflower oil, and wholesale trading in cereals (wheat, barley and maize). The operations of Kernel Holding SA encompass almost every area of the food industry – the complete process of manufacturing and supplying oils and fats of plant and animal origin, including production, refining, bottling, and sale of bottled and unbottled oils domestically and abroad, as well as the cultivation, harvesting, storage and sale of cereals and oil-bearing seeds (www.kernel.ua). In contrast to the previous two companies, Kernel Holding SA was floated on the Warsaw Stock Exchange in November 2007.

Measurements of intellectual capital were performed for each of these groups using financial data for the years 2012, 2013 and 2014, taken from financial

statements available on investment websites. The tables below present the values used in the relevant formulae for the companies in those years.

The calculations described here serve to examine whether each method gives a true picture of the analysed company's intellectual capital, whether the comparison of market value to book value is a legitimate technique, and whether the interpretation of the results as proposed in the literature is appropriate for the practical application of each method, as well as other similar questions noted in the theoretical section.

The MV/BV and Tobin's q methods in the case of KSG Agro SA

Assuming that the results obtained under the MV/BV model or by Tobin's q index can be interpreted based on the concept of intellectual capital, the results obtained for KSG Agro SA imply that the company does not possess a high level of assets of that type. It might be concluded that its business is based on tangible assets; but when the given values are interpreted as an answer to the question of whether the company is adequately valued by the market, it will certainly be concluded that according to the MV/BV method the market (except in the final analysed year, when the results were affected by the political situation in the country of operation) values the company to the level of its real worth, while Tobin's q index implies that the market value is even higher than the company's book value. The obtained results are presented in Tables 4.5. and 4.6.

Table 4.5. MV/BV index for KSG Agro SA

Item	2012	2013	2014
Company share price ¹¹⁸ (US\$)	5.41	3.53	1.19
Number of shares ¹¹⁹	14 925 500.00	14 926 600.00	14 926 000.00
Total book assets (US\$)	203 770 000.00	237 270 000.00	88 390 000.00
Outside capital (book value) (US\$)	123 270 000.00	188 550 000.00	106 780 000.00
"Intellectual capital"	1.00	1.08	-0.97

Source: based on data from the financial statements of the KSG Agro SA group

The presented interpretation of the results in Table 4.5. is borne out only in theory. In reality it is unlikely that the firm does not possess any intellectual capital, as would be implied by the values that are less than 1. According to the description of the operations of KSG Agro SA, the company uses innovative methods and has an appropriate organisational culture and structure, technologies and other similar components of intellectual capital (human capital, structural capital). According to

¹¹⁸ Based on the average zloty/dollar exchange rate for each year: 2012 – 3.2581; 2013 – 3.1614; 2014 – 3.1537.

¹¹⁹ Data from the bankier.pl website, <http://www.bankier.pl/gielda/notowania/akcje/KSGAGRO/wyniki-finansowe/skonsolidowany/roczny/standardowy>, accessed on: 22.11.2015.

the concept of intellectual capital, results below 1 can as a last resort be explained as a situation in which the company does not base its operations on the creation of intellectual capital, but in a certain sense on tangible assets.

Tobin's q , which to some extent brings the book value closer to the market value, gave a significantly better picture of the business than the result obtained from the MV/BV model. According to the calculated values, in the period under analysis KSG Agro SA was valued by the market on average at one-and-a-half times its worth as implied by its book value. This would indicate the existence of hidden value in the firm. Despite the fall in the market value of its shares, the company is capable of obtaining above-average profits and makes effective use of its intangible assets (Table 4.6.).

Table 4.6. Tobin's q index for KSG Agro SA

Item (US\$)	2012	2013	2014
Market value of ordinary shares	80 762 579.09	52 691 449.47	17 748 028.57
Book value of preference shares	-	-	-
Long-term liabilities	11 060 000.00	28 250 000.00	11 030 000.00
Short-term liabilities	83 340 000.00	48 590 000.00	77 900 000.00
Inventories	9 630 000.00	6 500 000.00	11 260 000.00
Book value of current assets	15 740 000.00	22 690 000.00	14 980 000.00
Replacement cost of tangible assets = total book value of assets	88 390 000.00	71 310 000.00	76 360 000.00
"Intellectual capital"	1.91	1.59	1.35

Source: based on data from the financial statements of the KSG Agro SA group

The final results obtained by the market capitalisation methods are affected not only by factors related to intellectual capital, but above all by external factors such as the market share price, dependent on the moods and preferences of investors, the market and political situation, and other phenomena which affect investment decisions and consequently the market value of the company, which also depends on the number of shares issued and the market price per share.

The example of KSG Agro SA shows the great significance of the averaged financial data used in the calculations, as well as data from the market. This is confirmed, for example, by the year 2014, when because of the political turbulence in Ukraine that was then affecting the markets, the company recorded negative equity, and its market value declined relative to the previous year. This confirms the doubts relating to the use of market values, which are intended to reflect the effective utilisation of intangible assets but are also affected by external factors, as well as book values, which depend, for example, on the type of accounting used.

The MV/BV and Tobin's q methods in the case of Industrial Milk Company SA

The results obtained for Industrial Milk Company SA imply that the firm does not possess assets of the type under consideration. The results given in Tables 4.7. and 4.8. are interpreted, according to the concept, as reflecting an absence of values resembling intellectual capital and the fact that the business is based on tangible assets. It can certainly be concluded (given theoretical assumptions) that according to the MV/BV method and Tobin's q index, the market (unlike in the case of KSG Agro SA) values this company below its real worth. The example of this company shows how highly theoretical the considerations are concerning the reliability of applications of the methods proposed in the literature for measuring intellectual capital.

Table 4.7. MV/BV index for Industrial Milk Company SA

Item	2012	2013	2014
Company share price (US\$)	3.83	4.61	2.72
Number of shares	31 300 000.00	31 300 000.00	31 300 000.00
Total book assets (US\$)	116 840 000.00	187 400 000.00	102 810 000.00
Outside capital (book value) (US\$)	118 550 000.00	209 630 000.00	156 770 000.00
"Intellectual capital"	-70.06	-6.48	-1.58

Source: based on data from the financial statements of Industrial Milk Company SA

The results obtained using the MV/BV method and Tobin's q index in the case of KSG Agro SA showed that in the analysed period that company was adequately valued by the market, at least partly due to its intellectual capital. The example of Industrial Milk Company SA gives a less positive picture than the previous case.

Table 4.8. Tobin's q index for Industrial Milk Company SA

Item (US\$)	2012	2013	2014
Market value of ordinary shares	80 762 579.09	52 691 449.47	17 748 028.57
Book value of preference shares	–	–	–
Long-term liabilities	45 100 000.00	48 010 000.00	67 790 000.00
Short-term liabilities	68 390 000.00	156 810 000.00	85 960 000.00
Inventories	63 530 000.00	139 050 000.00	82 960 000.00
Book value of current assets	116 840 000.00	187 400 000.00	102 810 000.00
Replacement cost of tangible assets = total book value of assets	244 500 000.00	361 870 000.00	183 800 000.00
"Intellectual capital"	0.58	0.58	0.83

Source: based on data from the financial statements of Industrial Milk Company SA

In this case the company is valued at below its book value, although over a period of three years that situation underwent a gradual change. As was noted in the previous example, such an extreme situation is not possible in reality – every firm has intellectual capital among its assets to a greater or lesser degree.

The MV/BV and Tobin's q methods in the case of Kernel Holding SA

The case of Kernel Holding SA is entirely different from that of the first two companies. The results here indicate that the value of intellectual capital decreased year by year. The company was initially valued by the market at above its value, according to the MV/BV model, while in Tobin's q model, which uses a value closer to the market value, the company was valued at close to its real value only in the first year, and that situation deteriorated in 2013 and 2014.

Table 4.9. MV/BV index for Kernel Holding SA

Item	2012	2013	2014
Company share price (US\$)	20.50	16.90	9.39
Number of shares	79 683 410.00	79 683 410.00	79 683 410.00
Total book assets (US\$)	2 116 390 000.00	2 361 630 000.00	1 919 020 000.00
Outside capital (book value) (US\$)	936 710 000.00	1 026 150 000.00	889 360 000.00
“Intellectual capital”	1.38	1.01	0.73

Source: based on data from the financial statements of Kernel Holding SA

The example of Kernel Holding SA (Tables 4.9. and 4.10.) again confirms the inadequacy of the proposed models for measuring intellectual capital – even as a means of obtaining rough values. The data in Tables 4.5.4.10 indicating the relationship between the market and book values can only be regarded as approximations, and also subject to the stipulation that they should be interpreted with the possibility of inaccuracies in mind (as in the extreme cases among the examples given).

Table 4.10. Tobin's q index for Kernel Holding SA

Item (US\$)	2012	2013	2014
Market value of ordinary shares	1 633 703 922.87	1 346 691 569.76	748 138 031.62
Book value of preference shares	–	–	–
Long-term liabilities	426 860 000.00	275 720 000.00	260 010 000.00
Short-term liabilities	446 160 000.00	700 080 000.00	597 360 000.00
Inventories	563 520 000.00	517 230 000.00	482 360 000.00
Book value of current assets	1 118 400 000.00	1 090 090 000.00	872 530 000.00
Replacement cost of tangible assets = total book value of assets	2 116 390 000.00	2 361 630 000.00	1 919 020 000.00
“Intellectual capital”	0.92	0.74	0.63

Source: based on data from the financial statements of Kernel Holding SA

It is necessary to reiterate the observation made in the case of KSG Agro SA – the results obtained using market capitalisation methods are strongly affected by the collected data and their source, by significant averaged values, by the situation of the market in which the firm operates, by the political situation, and by the applied accounting standards and similar factors.

The EVA™ method in the case of KSG Agro SA, Industrial Milk Company SA and Kernel Holding SA

In considering the models analysed above, note should be taken of the corresponding results obtained by the EVA™ method. In the case of KSG Agro SA (Table 4.11.) the previous models indicated a positive situation, and the results appeared to confirm that the company possessed intellectual capital. By contrast, the EVA™ method fails to show this, and in fact indicates that the company’s “value added” is negative. Based on the assumptions related to the concept of intellectual capital, it is concluded that KSG Agro SA does not have such capital, although a positive finding is that over the three years of analysis the company’s value added showed an increase. The negative results are interpreted as indicating a lack of capital to cover the costs of generating profits.

Table 4.11. Measurement of the intellectual capital of KSG Agro SA by the EVA™ method

Item	2012	2013	2014
EBIT (operating profit) (US\$)	18 250 000.00	-9 150 000.00	2 250 000.00
T (average tax rate) ¹²⁰	21%	19%	16%
WACC ¹²¹	15.1%	15.4%	15.50%
Equity (US\$)	80 500 000.00	48 720 000.00	-18 390 000.00
Interest-bearing liabilities (short- and long-term loans, short- and long-term derivative financial instruments) (US\$)	94 860 000.00	157 650 000.00	106 919 988.48
“Intellectual capital” (US\$)	-12 061 860.00	-39 192 480.00	-11 832 148.00

Source: based on data from the financial statements of the KSG Agro SA group

The situation of Industrial Milk Company SA (Table 4.12.) is an example where the company is found to have “value added” even though the previous methods failed to show positive relations between market and book value or the existence

¹²⁰ KSG Agro SA operates in Ukraine, hence the different tax rates; it should be noted, however, that agricultural production companies in that country, rather than pay tax on profits, are able to take advantage of a more favourable system based on a fixed agricultural tax, subject to certain conditions. For the purposes of this analysis it is assumed that the company pays standard corporation tax.

¹²¹ Due to difficulties in accessing information, the weighted average cost of capital was taken to be the average for companies in the food sector, based on reports of analysts.

of intellectual capital. The example of Kernel Holding SA (Table 4.13.) reveals an analogous situation to that of KSG Agro SA.

Table 4.12. Measurement of the intellectual capital of Industrial Milk Company SA by the EVA™ method

Item	2012	2013	2014
EBIT (operating profit) (US\$)	23 740 000.00	37 650 000.00	45 790 000.00
Average tax rate ¹²²	0.21	0.19	0.16
WACC	15.10%	15.40%	15.50%
Equity (US\$)	-14 030 000.00	39 950 000.00	31 700 000.00
Interest-bearing liabilities (short- and long-term loans, short- and long-term derivative financial instruments) (US\$)	80 643 000.00	139 987 000.00	106 947 000.00
“Intellectual capital” (US\$)	8 696 037	2 786 202	16 973 315

Source: based on data from the financial statements of Industrial Milk Company SA

Table 4.13. Measurement of the intellectual capital of Kernel Holding SA by the EVA™ method

Item	2012	2013	2014
EBIT (operating profit) (US\$)	258 750 000.00	190 690 000.00	117 820 000.00
Average tax rate ¹²³	0.28	0.28	0.28
WACC	15.10%	15.40%	15.50%
Equity (US\$)	1 179 680 000.00	1 335 480 000.00	1 029 660 000.00
Interest-bearing liabilities (short- and long-term loans, short- and long-term derivative financial instruments) (US\$)	739 786 000.00	730 681 000.00	456 241 000.00
“Intellectual capital” (US\$)	-103 539 366	-180 891 994	-145 484 255

Source: based on data from the financial statements of Kernel Holding SA

The CIV method in the case of KSG Agro SA

The CIV method is based on company data from the three years preceding the year of analysis. For this reason (in Table 4.14.), and in view of the availability of financial data, results are presented only for 2014, three years after the company was first listed on the Exchange.

¹²² Based on the same assumptions as in the case of KSG Agro SA.

¹²³ The company operates in Ukraine, but is based in Luxembourg, and hence is subject to a different tax rate than KSG Agro and Industrial Milk Company.

Table 4.14. The companies' intellectual capital in 2014 by the CIV method

Item	KSG Agro SA	Industrial Milk Company SA	Kernel Holding SA
Average pre-tax profit (for the three preceding years) (US\$)	3 183 333.33	20 736 666.67	74 730 333.33
Average value of tangible assets (for the three preceding years) (US\$)	127 406 666.67	167 927 016.67	1 599 110 666.67
ROA (quotient of the previous two figures)	2.50%	12.35%	4.67%
Average ROA for the sector (for the three preceding years)	3.06	3.06	3.06
Excess = avg. pre-tax profit – (avg. ROA for sector * avg. ROA) (US\$)	3 183 333.33	20 736 666.63	74 730 333.32
Average tax rate for the three preceding years	0.22	0.22	0.28
Avg. tax rate * excess (US\$)	689 722.22	4 492 944.44	20 924 493.33
Discount rate (alternative cost of capital)	15.3%	15.3%	15.3%
“Intellectual capital” (US\$)	598 025.05	3 895 616.56	18 142 624.27

Source: based on data from financial statements

The results obtained using the CIV model lead to a different interpretation than those presented above. The main purpose of the model is to show how much a company would gain, on average, if it fully utilised its present level of intellectual capital. From the results obtained, and their analysis over time (if the data permit this) an evaluation is made of the potential of the firm's intellectual capital. The final result – the “intellectual premium” – is the firm's potential average earnings based on its intellectual capital, taking account of the situation of all firms in the same sector. According to the above data it can be concluded that KSG Agro SA is able to generate over US\$0.5m profit more than at present if it fully utilises its resources of intellectual capital. This company is relatively new to the Polish capital market, but its results in subsequent years will show whether it is improving its ability to generate further profits from its intangible assets, or whether it is using them ineffectively. The value of the capital called the “intellectual premium” accounts for only a small part of the company's current book value, overlooking the fact that in 2014 KSG Agro SA's book value was negative, which clearly shows how the appropriate use of a firm's intellectual potential can affect its final results. Comparing the analysed companies, the lowest level of utilisation of intangible resources is found in the case of Kernel Holding SA, which, if it made full use of those resources, could achieve over US\$18 million higher profits than at present. The second-ranked company in terms of non-utilisation of resources is Industrial Milk Company SA, while the company making the best use of its intangible wealth is KSG Agro SA.

Conclusions

Intellectual capital is a significant distinguishing factor for firms in the present-day economy. Knowledge, its related elements and overall utilisation affect the results that a company attains. Appropriate management in this area can bring about further successes for a firm in which processes of this type are present. One of the tools of management is knowledge of the values that are to be managed. The models described in this paper are only the most popular methods of measuring intellectual capital; all of them have their advantages and disadvantages. Unfortunately, due to the lack of a single universally accepted definition of intellectual capital, no concrete requirements have been established as regards the measurement of intellectual capital and the manner in which it is reported. The analysis presented here has led to the following conclusions:

- The methods selected for analysis – Market-To-Book Value, Tobin's q index, Economic Value Added (EVA™) and Calculated Intangible Value – belonging to the first two groups in Karl-Erik Sveiby's classification, and selected methods from the group based on market capitalisation, proved to be useful in identifying trends or the effectiveness of the use of intellectual capital in companies in the agricultural and food sector.
- The proposed methods, widely described in the literature, are largely based on values taken from the financial statements of the analysed companies, and on the market value, which is also affected by external factors beyond the firm's control.
- The market value is affected not only by the opinions of potential investors, but by many other factors, which can lead to significant controversy regarding methodologies of this type.
- The implementation of common uniform analytical models for the companies operating in a given market may enable not only a better management of capital in individual firms in the agricultural and food industry, but also the identification of shortcomings which need to be addressed to improve the competitiveness of their management.

4.3. The effects of payments for public goods on farmland prices under SAPS

(Bazyli Czyżewski, Radosław Trojanek¹²⁴)

Introduction

The opinion has become widespread in the subject literature that agricultural subsidies, particularly those of the decoupled type, are capitalised in the value of agricultural land. As a result, landowners obtain higher land rents. If they are farmers, then this entails an increase in the economic power and liquidity of farms, insofar as land capital can serve as collateral to obtain credit. These mechanisms have been well studied in the case of the Single Payment Scheme (SPS), which operates in the countries of Western Europe, as well as various support programmes operating in the United States, as detailed in the literature review. There is, however, a lack of research concerning the drivers of the value of agricultural land under the Single Area Payment Scheme (SAPS), which operates under the EU Common Agricultural Policy in the countries of Central and Eastern Europe. There are reasons to believe that the impact of agricultural policy as well as other factors on land values is different under this system. The basic difference between the SPS and the SAPS is that in the SAPS system there are no disposable entitlements to payments, and every hectare of land fulfilling specified conditions receives the same subsidy (both basic and supplementary). Thus in addition to the single area payment (SAP) a land user may additionally receive supplementary payments – for example, for cereal production, for Less Favoured Areas (LFAs) and/or on account of environment subsidies (ES) – to a predefined amount. Theoretically, the right to subsidies belongs to the user of agricultural land, but in practice they are generally taken over by the owner. In these conditions, considering that at the start of each planning period the subsidy for each hectare is known, and there is no limited pool of entitlements to payments, the market is theoretically able to discount the incidence of agricultural policy in land prices a long time in advance. This happened after 2004, when as a result of Poland's accession to the EU the prices of land in all categories and locations rose sharply, and since then they have continued on a strong upward trend, discounting the expected political rents. This process could operate without significant barriers, because although the market for agricultural land in Poland is subject to regulation,

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that regulation is effectively limited to granting the right of pre-emptive purchase to the government's Agricultural Property Agency (ANR) and placing certain restrictions on the purchase of land by foreigners. It is hard to say, however, to what extent at the present time agricultural policy, and payments for public goods in particular, cause differences in land prices and are capitalised in the value of agricultural land. The authors have attempted to fill these gaps in the literature by carrying out a study of the drivers of agricultural land values in a leading agricultural region of Poland. The study was preceded by an examination of the literature on potential drivers of agricultural land prices in various conditions. The aim of the study is to establish how the payments for public goods contribute to land values in the SAPS system. The authors propose the hypothesis that the key factors for land values are location-specific factors identified according to the economic functions of a given area. The public goods aspect is of particular interest, since theoretically no market mechanisms for their valuation should exist. According to economic theory, the market alone is not capable of ensuring an optimum supply of a public good, always producing a deficit instead (Atkinson and Stiglitz 1980). However, not all types of CAP subsidies carry a tangible effect in the form of public goods. The concept of a public good here is something of a generalisation. It includes not just utilities with the attributes "non-rivalrous" and "non-excludable" – namely pure public goods (Buchanan 1968; Head 1962) – but also common goods. Although it is debatable whether support from the first pillar of the CAP leads to the creation of public and common goods, a certain step in this direction is provided by the principle of *cross-compliance*. Nonetheless, a number of programmes under the second pillar of the CAP, directed towards the development of rural areas, undoubtedly lead to the direct creation of new common goods or care for existing ones, for example in less favoured areas (LFAs), which generally contain valuable natural features. We can therefore assume that the following have the attributes of public goods: agri-environmental payments, subsidies for LFAs, and area payments.

Evidence for the contribution of public goods to the land value

There is a thesis in the subject literature, according to which public goods and environmental amenities are responsible for a divergence between the market values of land and its use value. This thesis can be proved with hedonic approaches that investigate land attributes at the transaction level.

Mainstream economic theory says that farmland values are determined by the discounted stream of expected returns (Burt 1986; Featherstone and Baker 1987; Capozza and Helsley 1989). There have been only a few attempts to estimate demand for public goods for which market data do not exist, including some environmental

amenities in rural areas (Czajkowski et. al. 2014; Carson and Czajkowski 2014). The results of Delbecq et al. (2014) show that farmland values are only partially explained by agricultural returns. Those authors identified multiple non-agricultural attributes of farmland contributing to its market value, which fall into three groups: population and urban influence, recreational and natural amenities, and locational characteristics. There are also those which include features of public goods, like the availability of recreational water or tree cover. However, only the following variables attained statistical significance: development potential, population intensity, tree cover, hunting licences, distance to golf course, distance to nearest college, and median household income (Polcyn 2015). There was shown to be a divergence between market value and agricultural use value. The value of agricultural land in excess of its use in agricultural production provides an empirical measure of the nonmarket goods and services provided by agricultural lands. However, when high natural amenity value or urban pressure is absent, “the value in excess” is also used as a measure of asset price bubbles (Delbecq et al. 2014). This excess value, no matter what its origins, is considered as a base for the tax treatment of agricultural properties (O’Dea 2013; Sherrick and Kuethe 2014). There is evidence that in many areas throughout the United States, the market value of farmland has exceeded its use value in agricultural production (Barnard 2000; Flanders, White and Escalante 2004). Farm real estate accounts for more than 80% of the total value of all farm assets. For that reason, farmland prices are perceived as a key determinant of farms’ financial condition (Briggeman et al. 2009; Nickerson et al. 2012). Recent empirical findings suggest that farm profitability will decline in the coming years in favour of the non-agricultural return component of values (Delbecq et al. 2014), which will become a very important factor in farms’ financial health. Since the non-agricultural drivers of economic surplus very often have the nature of public goods, the labour and land markets in agriculture might suffer from the free-riding phenomenon (Kaminski et.al. 2012). Farmland provides various public goods, such as biodiversity, climate regulation, rural culture and open space, as well as features that indirectly impact food quality and human health. Wasson et al. (2013) argue that parcel-level attributes that comprise recreational and visual values are essential to explain agricultural land value. Failure to include amenity attributes in the set of explanatory variables of farmland value results in failure to fully account for land price variation. According to the above-cited authors, amenity premiums as well as penalties play a large role, especially in amenity-rich areas. For example, in western Wyoming (US), amenity values constitute 5% to 60% of a parcel’s value (one-third on average). However, several European studies contradict this observation. According to Nilsson and Johansson (2013), agricultural environmental payments in Sweden have a negative influence on land prices. They argue that municipalities receiving agri-environmental

support have very sensitive environments which are difficult to cultivate. A similar conclusion was reached in previous studies by Rutherford et al. (1990).

The hedonic approach is probably the way of investigating land value drivers that has been most explored in the literature. In this approach one does not focus on a specific type of value determinants (e.g. agricultural returns, rural amenities, property rights), but considers all possible qualitative variables that count for a potential buyer at the transaction level. (For the methodology of hedonic analysis, see Palmquist and Danielson 1989; Faux and Perry 1999; Nivens et al. 2002; Miranowski and Hammes 1984; Ma and Swinton 2012; Maddison 2000). Hence, the area, soil quality, environmental “quality”, agricultural practices, location of plots, distance and access to markets and to the nearest city, and connectivity to roads have all been found to affect land values (Troncoso et al. 2010; Carreño et al. 2012; de la Fuente et al. 2006; Gavier-Pizarro et al. 2012; Leguizamón 2013; Bárcena et al. 2004; Pengue 2005a), as well as land tenure (owned or rented), which impacts fertilisation, the adoption of conservation practices, long-term land improvements, and indirectly returns (Choumert and Phélinas 2015). Choumert and Phélinas (2015,) found that plots rented (by either individuals or companies) have a lower value relative to plots owned, when all other factors are similar. This supports the idea that owned land may be subject to better conservation practices than rented land.

Methodology for hedonic regression

The first documented use of hedonic regression dates back to 1922, when G. A. Hass developed the farmland price model. As he published the results in the form of a technical report, the real influence of this research on the popularity of the hedonic method was far from significant (Colwell and Dilmore 1999). In 1926, Watt conducted a similar study of farmland prices, while in 1928 Waugh analysed vegetable prices. However, it is Andrew Court who is considered to be the father of the hedonic method. In 1939, he examined the influence of the attributes of cars on their prices. The first researcher to use the hedonic method to analyse the real estate market was probably Ridker (1967), who aimed to identify the influence of pollution reduction on house prices (Coulson 2008). The theoretical framework of the hedonic method was developed by Lancaster (1966).

The essence of the hedonic method lies in the assumption that the price of heterogeneous goods may be described by means of their attributes. In other words, this method may be used to estimate the value of particular attributes of a given product. In order to identify the influence of individual features on the value of a specific good, econometric equations are constructed. The price of a given good is the response variable, while its quantitative and qualitative attributes are the explanatory variables. The equation may be written as follows (4.6):

$$P = \beta_0 + \sum_{i=1}^K \beta_i X_i + u \quad (4.6)$$

where:

P is the price of a good;

β is the regression coefficient;

X is an attribute of a good (value driver);

u is a random error.

The key issue in hedonic methods is the choice of the form of the regression function. The log-linear (natural logarithm) form of the regression function is most frequently used for studying changes in the real estate market in empirical research. In line with this approach, we employed the following equation (4.7):

$$\log P_i = \alpha_0 + \sum_{k=1}^K \alpha_k \cdot X_{ik} + \sum_{m=1}^M \beta_l \cdot Z_{im} + u_i \quad (4.7)$$

where $i = 1, \dots, n$ are the transactions in the sample, P_i is the price of real estate (i.e. agricultural land), X_k is the k th attribute of the land (cf. Table 4.15.), and Z_m are the M policy variables (dummy variables for different combinations of subsidies on a plot).

This function represents a *fixed effects coefficient regression model*. In the studied population, however, the problem of clustering arises, and price functions may have a different position and gradient depending on the type of rural areas to which they relate, as is also indicated in the literature review (for example, pro-environmental subsidies are capitalised in the value of land differently in tourist regions than in typical agricultural regions). Therefore, in the study, a random quota-based selection was made to obtain a sample of 653 agricultural land transactions from a four-year period (approximately 10% of all transactions in the area studied), proportional to the prevalence of each of four types of rural areas (described below) in the Wielkopolska region. This is considered to be a leading region in terms of agricultural production¹²⁵, agrotechnology and the development of agribusiness in Poland, and this ensures a full cross-section of the attributes affecting land prices, as well as theoretically ensuring that speculative motives in land purchasing decisions are of low significance. Relations between demand and supply in the market for agricultural land in Wielkopolska can be described by the term “land hunger”. A strong and unique feature of this study is the description of each transaction (of which 90% are private transactions) by means of a set of 16 features including use values, amenities, and payments for public goods (under the EU CAP) – for details

¹²⁵ 15% of gross agricultural output, including 10% of crop output and 20% of animal output, where average total output per Polish region is about 7%.

see Table 4.15. In the opinion of the authors, the scope of the study, in terms of the area and features covered, is fully sufficient to enable its objectives to be attained.

Table 4.15. Explanatory variables in the log-linear regression for agricultural land prices

No.	Variables	Description of variables used in the model
1.	Type of rural area	Three types of area: competitive agriculture, peripheral, agrotouristic. Each area type is a proxy for a specific set of land use attributes and rural amenities.
2.	Year	2010-2013; dummy variable; YES/NO
3.	Surface area	Total area of land purchased, in ha
4.	Distance to the nearest city	km
5.	Distance to the largest city in the powiat (NUTS 4)	km
6.	Land productivity coefficient	Valuation according to type of agricultural complex, developed by IUNG, Puławy, taking account of crop yield; a proxy for agricultural return; may also be treated as a lowest-level grouping variable.
7.	Division	A dimensionless, ordinal indicator; the more plots contained in the property, the lower the value.
8.	Shape	A dimensionless, ordinal indicator: rectangle/trapezium/triangle/irregular
9.	Perimeter	m
10.	Shape coefficient	Includes variables 9-11, according to the formula $40 \cdot \pi \cdot (\text{area} / \text{perimeter}^2)$
11.	Building permission	Dummy variable; YES/NO
12.	Distance to the nearest buildings	m
13.	Proximity of asphalt/dirt road	Dummy variable: asphalt/dirt
14.	SAPS area payments only	Dummy variable: YES/NO; in the SAPS area payments per ha are equal for each parcel, which meets the GAP conditions.
15.	SAPS area and LFA payments	Dummy variable: YES/NO; in the SAPS LFA additional payments per ha are equal for each parcel.
16.	SAPS area, LFA and environmental payments	Dummy variable: YES/NO; in the SAPS additional environmental payments per ha are equal for each parcel participating in a given support programme.

Source: based on data from registers of features and values of properties maintained by county (powiat) authorities, land register information from the National Geoportal, and agricultural soil maps from the Provincial Geodetic and Cartographic Repository.

As noted above, three types of rural areas were distinguished, based on a typology developed for the Wielkopolska region (*Raport pełny z badania* 2014), and for each of them a separate price function was calculated (4.7):

- 1) Areas of competitive agriculture, with economically strong farms that provide the main source of income for the population (often featuring mixed agriculture). These areas have lower population density than the city-integrated areas, and they include small towns and villages as an integral part, providing administrative and supply services to agriculture.

- 2) Peripheral areas, where farms with low economic power are predominant, with high levels of long-term and hidden unemployment, poverty and social exclusion. In these areas the condition of the technical, economic and social infrastructure is poor and continues to decline. Also the population density is low and still decreasing.
- 3) Agrotouristic areas, with large areas of forests, lakes and valuable resources of nature, with a well-developed infrastructure for rural tourism. Recreational values (environmental rent) undoubtedly increase the value of agricultural land here, and a significant proportion of the land (approximately 20%) constitutes Natura 2000 areas, including landscape parks, national parks and forests.

There are several reasons for the choice of the log-linear function (Malpezzi 2003). Firstly, the log-linear model allows the added value (for example, the value resulting from a higher standard) to change proportionally to changes in the size and other attributes of the dwelling (in the case of a linear function, for example, improvement of the standard will have the same influence on the value of a dwelling with a floor area of 30 m² and one with an area of 100 m², whereas in the case of the log-linear function this influence will be differentiated). Secondly, the estimated regression coefficients are easy to interpret. The coefficient of a given variable may be defined as the percentage change in the value of a dwelling caused by a unit change in a value driver. Thirdly, the log-linear function often eases problems connected with the variability of a random component.

Land plots are heterogeneous in nature. This heterogeneity can create heteroscedasticity in the residuals of the estimation of the price function. Indeed, we detect heteroscedasticity in our models (according to White's test). Therefore, we estimate a robust model, employing GLS (a backward stepwise method) and addressing unobserved land attributes to the agricultural policy variables Z_m . We have also reduced the problem of time, using dummy variables for each year over the period 2010-2013. Due to the high number of independent variables available, multicollinearity may be a serious concern. We recall that multicollinearity leads to unstable coefficients and inflated standard errors. We used Variance Inflation Factors (VIFs) to detect it. The VIF values in our model do not exceed 1.2 (and mean VIFs do not exceed 1.16, cf. Table 4.16.–4.18.), which is in line with the most conservative rules of thumb that the mean of the VIFs should not be considerably larger than 1 (Chatterjee and Hadi 2006). The estimated models are quite well fitted, since they explain 60% to almost 90% of the price variations, depending on the type of rural area. We can assume that the unobserved variation reflects the effect of speculation on land prices (besides unmeasured characteristics), which differs

between rural areas with different functions. The marginal effects for the models are presented in Tables 4.16–4.18.

Results for hedonic regression

Above all, it must be noted that the market for agricultural land in the Wielkopolska region shows a great deal of variation: the mean price of a purchased property was approximately 103,000 PLN (median 60,000 PLN) with a standard deviation of 128,000 PLN, which gives a coefficient of variation of 1.24. The price per hectare is less variable: its mean is approximately 26,000 PLN (median 24,000 PLN) with standard deviation 16,000 PLN (coefficient of variation 0.6). Neither of these two variables has a normal distribution (Shapiro-Wilk tests lead to a rejection of the hypothesis of normality at $p < 0.0001$); they both exhibit right-handed asymmetry (strongly in the case of prices per property). In this situation it was found that the set of explanatory variables at the transaction level, omitting the location-specific factors, explain the variation in prices of agricultural properties and in prices per hectare to only a small degree (the coefficient R^2 was below 0.3). This can be partially ascribed to speculation in the land market and the significant demand disequilibrium, but it is the location-specific factor that has a key impact: a rural area type. The solution to this problem is therefore either the use of multilevel (hierarchical) modelling, or the calculation of separate functions for different locations. An observation of the sample divided according to that criterion showed that the rural area type not only affects the position and gradient of the regression function, but also changes the sign of some regressors. We therefore decided to compute four log-linear models of the prices of agricultural properties for each area type, and to compare them. These models have a normal distribution (for $p > 0.01$) and give a good fit (R^2 between 0.6 and 0.88) – cf. Tables 4.16–4.18. The problem of collinearity does not occur in these models. As noted above, the parameters were calculated using the GLS method, in view of the heteroscedasticity.

The **model for agrotouristic areas** shows the best fit ($R^2=0.88$, cf. Table 4.16.), which may indicate that speculative motives in land purchase transactions are relatively uncommon here. Also of lowest significance here is the area of the property purchased, since an increase in the area by 1 ha increases the price by just 11% (see the EXP column in Table 4.16), compared with over 30% in the case of city-integrated and peripheral areas. Moreover, it is only in this model that an increase in distance from a city has a positive effect on the land price, since this increases the environmental rent – by approximately 6% for each kilometre further from the city. Similarly, proximity to a dirt road produces an increase in price. Only in this model was it found that the production value of the agricultural complex was statistically

Table 4.16. Regression results for agrotouristic rural areas

<i>Independent variables</i>	Dependent variable: Log land price				
	<i>coefficients</i>	<i>EXP for coefficients</i>	<i>standard errors</i>	<i>p value</i>	
const	10.8032	49177.92	0.216956	<0.0001	***
year 2012 (yes)	-0.25981	0.771196	0.128072	0.0472	**
area (ha)	0.104701	1.110379	0.00640357	<0.0001	***
building permission (yes)	0.268605	1.308138	0.11088	0.0186	**
distance to the nearest city (km)	0.062951	1.064975	0.0245442	0.0130	**
land productivity (coeff.)	0.007726	1.007756	0.00268565	0.0056	***
dirt road proximity (yes)	0.171264	1.186804	0.0961178	0.0801	*
area&LFA&env. payments on plot (yes)	-0.2339	0.791439	0.124572	0.0655	*
Observations	65				
R-squared	0.879069				
Adj R-squared	0.864218				
Mean for dependent variable	12.11319				
Standard dev. for dependent variable	0.924049				
VIF mean ¹	1.146429				
Doornik-Hansen ²	8.36531, p = 0.015258				
Shapiro-Wilk	0.956666, p = 0.0230445				
Lilliefors	0.103088, p ~ 0.08				
Jarque-Bera	11.5959, p = 0.00303376				

¹ Variance Inflation Factors; $VIF(j) = 1/(1 - R(j)^2)$; it should not exceed 10

² The last four rows present statistical tests for the normality of the residuals' distribution (we reject H₀, that the distribution is normal, when $p < 0.01$)

Source: own computations using gretl 1.10.1 software based on data from table 4.15. (see more Czyżewski, Trojanek 2016; granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572).

significant, with a positive effect on price. The strongest positive influence on price comes from the possibility of building, which increases the price of a property by as much as 30%. This is logical if it is assumed that land purchases in such areas are made with a view to investing in hotels, holiday homes or residences. Most interesting, however, is the fact that properties with the possibility (confirmed in practice) of receiving additional LFA and environmental payments had approximately 20% lower prices. This shows, firstly, that the limitations on farming use connected with obtaining payments of that type have a negative effect on land rent, and also restrict opportunities of earning from rural tourism. This does not reflect well on the construction of the scheme of payments for public goods under the CAP, since in agrotouristic areas it should be complementary, not substitutive, with respect to the multifunctional development of the countryside. The conclusion can also be drawn that these payments are too low and fail to compensate for the opportunity costs of pro-environmental management. Attention should also be drawn to the free term,

Table 4.17. Regression results for peripheral rural areas

<i>Independent variables</i>	Dependent variable: Log land price				
	<i>coefficients</i>	<i>EXP for coefficients</i>	<i>standard errors</i>	<i>p value</i>	
const	10.1534	25678.26	0.0822652	<0.0001	***
year 2010 (yes)	-0.21872	0.803545	0.113505	0.0548	*
year 2011 (yes)	-0.12735	0.880425	0.0559672	0.0235	**
area (ha)	0.285049	1.329827	0.01146	<0.0001	***
distance to the nearest city (km)	-0.02922	0.9712	0.00648758	<0.0001	***
distance to buildings (m)	-0.00024	0.999763	7.07341e-05	0.0009	***
area payment on plot (yes)	0.209708	1.233318	0.054653	0.0001	***
area&env. payments on plot (yes)	0.307492	1.36001	0.0818652	0.0002	***
Observations	355				
R-squared	0.676785				
Adj R-squared	0.670265				
Mean for dependent variable	10.95707				
Standard dev. for dependent variable	0.800178				
VIF mean ¹	1.076143				
Doornik-Hansen ²	5.7928, p = 0.0552216				
Shapiro-Wilk	0.993156, p = 0.106296				
Lilliefors	0.041126, p ~ 0.15				
Jarque-Bera	4.48144, p = 0.106382				

¹ Variance Inflation Factors; $VIF(j) = 1/(1 - R(j)^2)$; it should not exceed 10

² The last four rows present statistical tests for the normality of the residuals' distribution (we reject H_0 , that the distribution is normal, when $p < 0.01$)

Source: own computations using gretl 1.10.1 software based on data from table 4.15. (see more Czyżewski, Trojanek 2016; granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572)

which on the assumption that the other regression coefficients are equal to zero, indicates the approximate “intrinsic” value of the land. In this case we have several dummy (zero-one) variables, the residual variants of which are contained in the free term. This applies to each of the four models, and so it is possible to compare the free terms to determine the relative intrinsic value of land in the various types of locations. It is encouraging that this is highest in the agrotouristic areas, which feature valuable resources of nature, followed by city-integrated areas (rent from urbanisation), and then typical agricultural areas; it is lowest in peripheral areas.

The **model for peripheral areas** (c.f. table 4.17.) features the strongest marginal effect of area on the price of a property – an increase by 1 ha causes the price to rise by 33%. Moreover, as could be expected, distance from the nearest city and from buildings are key factors in such areas. A 1 km increase in the distance from a city lowers the price by approximately 3%, while the same increase in the distance from buildings lowers the price by around 20%. In terms of the objective of the

study, however, the most interesting fact is that this is the only area type where area payments, and paradoxically environmental payments, perform their intended role and are capitalised in agricultural land prices. The receipt of area payments (SAP) increases the price of a property by approximately 23%, while the receipt of both area and environmental payments increases the price by around 36%.

Table 4.18. Regression results for rural areas with competitive agricultural production

<i>Independent variables</i>	Dependent variable: Log land price			
	<i>coefficients</i>	<i>EXP for coefficients</i>	<i>standard errors</i>	<i>p value</i>
const	10.3617	31624.9	0.228027	<0.0001 ***
year 2010 (yes)	-0.54426	0.580271	0.151515	0.0008 ***
year 2012 (yes)	-0.472928	0.623175	0.226307	0.0419 **
area (ha)	0.158104	1.171288	0.023218	<0.0001 ***
distance to the nearest city (km)	0.0326636	1.033203	0.0101866	0.0024 ***
shape_coeff.	0.0525118	1.053915	0.0264091	0.0524 *
area&LFA payments on plot (yes)	-0.465631	0.627739	0.191535	0.0188 **
Observations	56			
R-squared	0.711919			
Adj R-squared	0.676644			
Mean for dependent variable	11.35700			
Standard dev. for dependent variable	0.952673			
VIF mean ¹	1.170833			
Doornik-Hansen ²	8.33389, p = 0.0154995			
Shapiro-Wilk	0.944521, p = 0.0121777			
Lilliefors	0.107954, p ~ 0.1			
Jarque-Bera	10.4555, p = 0.00536549			

¹ Variance Inflation Factors; $VIF(j) = 1/(1 - R(j)^2)$; it should not exceed 10

² The last four rows present statistical tests for the normality of the residuals' distribution (we reject H0, that the distribution is normal, when $p < 0.01$)

Source: own computations using gretl 1.10.1 software based on data from table 4.15. (see more Czyżewski, Trojanek 2016; granted by the National Science Centre in Poland, OPUS 6 UMO-2013/11/B/HS4/00572).

The **model for areas with competitive agricultural production** (c.f. table 4.18.) is distinguished by the significance of the property shape coefficient (including division into plots). This can be explained by the observation that large plots of regular shape make agrotechnical operations easier. It is also interesting to note that a 1 km increase in the distance to a city increases the land price by 3%. This can be explained by the theory of inverted von Thünen rings (Sinclair 1967; Wigier 2012), according to which production and yield per unit area of land increase with increasing distance from the urban centre and decreasing impact of urbanisation. As a result, the value of land with typical agricultural uses in the vicinity of towns is

inversely proportional to its market price. This theory would appear to be valid for rural areas of this type, particularly since the profitability of agricultural production is dependent on its scale, and farms with larger areas are found at a greater distance from towns. The greatest surprise is the fact that in this model the receipt of LFA payments causes a very large (38%) decrease in the price of agricultural properties. It can be accepted that LFAs by definition contain less profitable agricultural land, but the purpose of the scheme is to compensate for the difficulties resulting from the unfavourable farming conditions. It can be concluded from this that the scheme is not fulfilling its role.

Conclusions

In summary, the following conclusions can be drawn from the analysis of the effect of payments for public goods under the SAPS on land prices:

- There is a very large variation in prices, and prices are strongly affected by speculation, which has driven the upward trend since the introduction of area payments in 2004. The impact of speculation is relatively small in areas with agrotouristic features.
- The location-specific factor “type of rural area”, based on land functions, is of key importance. An observation of the sample divided by this criterion showed that it changes not only the position and gradient of the regression function, but also the sign of some regressors. The area type determines whether particular use values, such as area or shape coefficient, and amenities, such as possibility of building, as well as payments under agricultural policy, affect the land price.
- Agricultural policy, in particular payments for public goods (SAP, LFA, ES), has a very large significance (marginal effects) for the value of agricultural land compared with other parcel-level attributes of properties.
- Payments for public goods (SAP, LFA, ES) are capitalised in land prices only in peripheral areas. Elsewhere they fail to perform their role, and are even associated with the decapitalisation of the value of land. Particularly in agrotouristic areas these schemes should be complementary and not substitutive with respect to the multifunctional development of the countryside. As early as in 2004 the SAPS system initiated an upward trend in agricultural land prices in all categories and locations, hence expectations as to increases in land prices are already discounted. Therefore, in most places at present, SAP support is not a differentiating factor for land value, in view of its general availability and low requirements, and the other payments do not compensate for the opportunity costs related to alternative ways of deriving rent from land.

4.4. EU Common Agricultural Policy and the development of agrotourism: a case study

(Agnieszka Brelik¹²⁶, Aleksander Grzelak¹²⁷)

Introduction

Rural areas are undergoing an evolution in terms of the functions that they perform. While in the 1980s it was productive (agricultural) functions that still dominated, at the present time touristic and recreational functions are increasing in importance. This is reflected in the importance ascribed to the latter functions in the development strategies of municipalities (Powęska 2005). Consequently, there is a growth in interest in the development of agrotouristic activity, both among farms and at local authority level. These activities are also supported by instruments of the EU's Common Agricultural Policy (CAP). It is assumed that the economic activation of rural areas and diversification of income sources are factors behind the development of those areas. Furthermore, agrotouristic activity favours the creation and quantification of public goods, and these in turn, by a mechanism of positive feedback, stimulate interest in agrotourism.

The particular characteristics of rural areas in various regions of Poland justify the need for the development of various forms of agricultural and non-agricultural activity, which play an important role in the economic development of the countryside and the creation of new jobs (Bogusz and Paluch 2011). The West Pomeranian region is particularly predisposed to the development of agrotouristic activity, in view of its environmental qualities. The main goal of this study is to determine the relationships in terms of how the support provided under the CAP to farms offering agrotourism services impacts their income position. Two research hypotheses are proposed:

1. Support for agrotouristic activity has a significant effect on the level of income from agrotourism;
2. Among the EU's CAP instruments it is direct subsidies that have the greatest impact on total income (from agricultural and agrotouristic activity).

The number of farms engaged in non-agricultural economic activity, including agrotourism, varies to a large extent between Polish regions. The largest numbers of such farms are found in the regions of West Pomerania (16.5%) and Pomerania (15.4%), and the smallest numbers in Podlaskie (10%) and Lubelskie (10.2%). With

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this in mind, the analyses in the present study were based on a survey carried out in 2012 in West Pomerania.

Methodology

A questionnaire-based survey was carried out in 2012 in 43 municipalities of West Pomerania in which farms engaged in agrotouristic activity had achieved an economic size greater than 4 ESU, as significance was attached to the element of economic activity resulting from agricultural production. The number of such farms in the province of West Pomerania was close to 190. The survey was carried out among the full population, but due to refusals and errors made in the filling out of documents, the analysis was restricted to 150 interview questionnaires. The survey provides significant conclusions relating to the studied phenomena in Poland as a whole, for farms engaged in agrotouristic activity and having an economic size above 4 ESU. Individual balance sheet and profit and loss account items were calculated according to the FADN agricultural accounting methodology. The research was carried out using estimation methods by qualified interviewers working for Agricultural Advisory Centres – inspectors having many years of experience in the conduct of such surveys. This made it possible to obtain statistical data of a relatively high reliability and formal correctness. The research tool was an interview questionnaire, the correctness of which in terms of form and content had been verified in pilot studies carried out in 2011 on a sample of 40 farms offering agrotourism services and in the course of consultation with the Agricultural Advisory Centre staff.

A variety of research methods were used in the work: descriptive analysis of the studied phenomena, comparative analysis, structural analysis and analysis of regression.

Public goods in the development of agrotourism¹²⁸

Existing models of agriculture, which focus primarily on the production function, viewing agriculture solely as a supplier of food, have come to be re-evaluated in the light of seeking other directions for its development. Such a model leads to an excessive intensification of the productive functions of agriculture or the outflow of resources to other uses not in accordance with existing needs. This produces numerous adverse external effects, as well as a reduction in the supply of public goods to non-agricultural sectors of the economy. On the other hand, there is now an ever increasing social need for the realisation of a wide range of objectives which might be achieved by reducing dysfunctions of the market mechanism (Czyżewski and Kułyk 2011). This requires an entirely different research perspective with respect

¹²⁸ This chapter is based on a previous article (Brelík 2015).

to the agricultural sector and rural areas, including agrotourism. For this reason the proper valuation of resources engaged in agriculture, through taking account of non-productive agricultural functions, leads to a reduction of pressure for the intensity of their use and in consequence reduces the creation of negative external effects. This revaluation results from the creation of additional sources of income, including those mediated by the state.

Global public goods are goods which are universal for all countries, groups of population and generations. The supply of such goods includes, for example, the production of oxygen, carbon sequestration (important for the prevention of climate change), protection of biodiversity (genetic, of species and of ecosystems), water protection, assurance of food safety, and conservation of the natural landscape. Because these are universal goods and equally important to all people, reward should be given for them according to a uniform system in all countries. In the case of local public goods (consumed at local level), reward for their supply should also be made at local (national or regional) level. These include, among others, natural and cultural landscapes. The landscape, in view of disturbance to its capacity for self-regulation, requires protection to enable it to maintain its balance and its characteristic features. The uniqueness of Poland's agricultural landscape is made up of the cultural heritage of the countryside and the creation of conditions for recreation and leisure (agrotourism). The possibility of having contact with nature is partly paid for through the purchase of private goods (farm holidays). Here, this represents the danger of the transformation of a public good into a club good (Baum and Śleszyński 2009).

Public goods, by increasing the value of the landscape and quality of life in rural areas, can be expected to provide motivation for the creation of agrotourism farms based on their value. They therefore enable better use of the labour factor and diversification of economic activity, while also increasing the revenue of local authorities (such as municipalities). Support for the process of delivering public goods, under this analysis, represents the creation of attractive employment in rural areas for highly qualified workers in the fields of agriculture, horticulture, food processing and services for the food sector. It is therefore a source of benefits enjoyed both by private entities operating on the basis of public goods, and by entire communities which obtain additional income in a variety of forms (at the various stages of the division of municipal revenue – primary, secondary and final). There is a danger resulting from the unequal benefits obtained by entities located in a municipality on account of the existence of public goods. Such a danger is noted in some of the studies referring to the model under consideration (e.g. Esteban and Ray 1999, Khwaja 2004). In this situation, entities receiving above-average benefits will increase their engagement of production factors. This may to some extent disturb

the equilibrium (environmental, for instance) and at the same time make the entire mechanism for the valuation of costs of supplying public goods more complex.

Agrotourism, as a tool for the development of municipalities, being in symbiosis with the multifunctional development of rural areas, should fulfil a basic function enabling the diversification of the local economy. Factors affecting the experience of tourists on farms are dependent to a large degree on the level of touristic attractiveness, natural values and quality of tourist products offered in a given locality – namely those called free goods, public goods and external effects. The quality of public goods primarily impacts not only the range of tourist services offered and the quality of tourists' experience, but above all the quality of life of the population.

The creation of desirable products by farmers leads to a number of external effects which are not expressed in market transactions. Hence, apart from market commodities, agrotourism also creates non-commodity products which, although they lack a market value and price, have the nature of public goods. External effects of agricultural management may also be undesirable for the surroundings. This occurs when agrotourism is accompanied by damage to the environment caused by irrational management of wastes. Hence the concept of multifunctional use of farmland and non-production functions in agriculture requires the creation of tools for the evaluation of the nature of those functions, their valuation, and the finding of appropriate methods of rewarding owners of agrotourism farms for their contribution to the renewal and shaping of the natural and cultural environment of the countryside, the rural landscape and an open, clean and friendly rural space (Poczta-Wajda, Kałowska 2016). Agrotourism as an integral part of a system of sustainable rural development may provide an important justification for the support of activity of this type in rural areas. Such measures are in line with the paradigm of sustainable development of agriculture and of rural areas.

The Common Agricultural Policy and the development of agrotourism

The Common Agricultural Policy of the EEC was originally oriented chiefly towards increasing the productivity of farms and the level of agricultural production. In the 1980s, production surpluses proved to be one of the chief problems in the functioning of markets for foodstuffs. Despite an increase in the productivity of the engaged factors of production, and the implementation of technological progress, the average level of agricultural incomes remained below parity. Only with the MacSharry reforms of 1992 did a reorientation of agricultural policy take place. More attention was paid to the fact that agriculture is intrinsically connected with rural areas. Its development is also a determinant of the quality of life of the rural population. Mechanisms were therefore introduced to encourage farmers to offer agrotouristic services as an alternative to agricultural activity. Further changes to the

Common Agricultural Policy reinforced this trend by giving additional emphasis to environmental issues and to the creation of public goods by agriculture. The latter are particularly likely to be produced by farms engaged in agrotourism. Assuming that such farms create and conserve public goods (including landscape, biodiversity, rural culture, tradition, food safety and food security), speculative capital has a lower tendency to engage in this process than do family farms.

The trends outlined here are expected to make rural areas more vital, multifunctional and thus also attractive to urban residents as a place to stay and spend free time. From this perspective, agrotourism may be perceived as an element of protection of the integrity of natural and socio-cultural resources (Bianchi 2011). It has even been suggested (Zegar 2002) that the future of rural families will largely depend on the creation of jobs in rural areas outside agriculture itself. This implies that the development of agrotourism may play an important role both in shaping the attractiveness of rural areas and in improving the income position. It is pointed out in this context that the development of agrotouristic initiatives is favoured by the support given for such purposes from EU funds, including under the LEADER programme (Anthopoulou 2000).

Poland's accession to the EU led to an improvement in the income position of rural inhabitants and the vitality of rural areas. In 2004-2013, funds for the development of agriculture and of rural areas were provided under the SAPARD pre-accession programme, the Rural Area Development Programmes (PROW 2004-2006 and 2007-2013) and the sectoral operational programme "Restructuring and Modernisation of the Food Sector and Development of Rural Areas 2004-2006"; additionally, both agriculture and rural areas received support from the national budget. These funds directly supported farmers' income (direct subsidies), as well as modernisation programmes (including the modernisation of farms), socio-structural actions (programmes of structural rents and land integration), the development of agrotourism and other forms of non-agricultural activity (differentiation towards non-agricultural activity), environmental programmes (e.g. environmental payments, transfers for bringing farms into line with EU standards and improvement of farm animal welfare), and the development of infrastructure in rural areas. These accelerated structural transformations in rural areas, and increased incomes, investment and the quality of agricultural production (particularly in the case of milk, poultry and horticultural production). They were of great importance in adapting the agricultural sector and rural areas to the new conditions of functioning within the EU.

In the initial period of Poland's membership of the EU, support for the development of agrotourism was provided through the sectoral operational programme "Restructuring and Modernisation of the Food Sector and Development of Rural Areas 2004-2006", under the measure titled *Diversification of agricultural and related activity to ensure variety of activity or alternative sources of income*. A

total of 891 projects were approved in the area of agrotourism, as well as 270 more relating to tourist and recreational services. These accounted for 27% of all projects, and apart from “minor services for residents of rural areas” constituted the category most frequently financed under that measure. Beneficiaries were mainly (76%) owners of smaller farms, i.e. those of economic size up to 4 ESU (Chmurzyńska 2007). This resulted from the seeking of additional sources of income by such farmers.

Under the Rural Area Development Programme (PROW) 2007-2013, support for agrotourism and rural tourism was possible primarily under axis 3: *Quality of life in rural areas and diversification of the rural economy*. In total that axis accounted for approximately 19% of the funds allocated under the PROW 2007-2013. It included two measures providing direct support for agrotourism: *Diversification towards non-agricultural activity*, addressed to the farming population, and *Creation and development of micro-enterprises*, relating to the rural population and rural entities. In the first, 7.2% of the projects implemented (883 out of 12,300) related to agrotourism, but in the second this figure was just 0.2%. The low level of interest under the second of the aforementioned measures indicates that the development of existing agrotourism operations is strongly preferred over the setting up of such operations from scratch (Siemiński and Poczta 2014). The most popular categories of products (under the *Diversification* measure) were those related to services to farms or forestry, services to the population, and construction works and services (for the *Creation and development of micro-enterprises* measure). The development of agrotourism at local level could also be financed under the Leader programme, and by local authorities under the *Renewal and development of the countryside* measure, which provided opportunities to promote and increase the attractiveness of tourism infrastructure. There were also opportunities for agrotourism to be financed not only from the CAP funds, but also under Regional Operational Programmes at provincial level. Actions in this area supported the development and promotion of tourism infrastructure.

The largest numbers of beneficiaries of support given for the development of agrotourism out of EU funds in 2004-2013 were found in the regions Lubelskie, Małopolskie, Podkarpackie, Podlaskie, Wielkopolskie and Warmińsko-Mazurskie, and the smallest numbers in Opolskie and Lubuskie. This may give a preliminary indication that it is not only the potential of the natural environment that determines the activity of entities in this area, but also the structure of farms, linked to the fragmentation of agriculture, which provides an incentive to seek additional sources of income. According to a survey¹²⁹, the support funds received were used

¹²⁹ A survey carried out in 2011 by ARiMR (Agriculture Restructuring and Modernisation Agency) among a sample of 463 beneficiaries of EU support for agrotourism, including 213 from PROW 2007-2013 and 250 from the sectoral operational programme and SAPARD. Results: *Wsparcie agroturystyki/turystyki wiejskiej przez ARiMR*, ARiMR, Warsaw 2012.

by beneficiaries chiefly to adapt residential buildings to touristic purposes (64%), develop land around houses (40%), purchase touristic and recreational equipment (33%) and fit out additional rooms for guests (31%). It is notable that the persons running farms that receive support for the development of agrotourism have a relatively high level of education (36% are graduates, and 46% have completed high school). This results from the fact that the development of this form of activity requires knowledge, qualifications and also “soft skills”, which are acquired during high school and especially college education. It should also be noted that many beneficiaries (90%) indicated in the cited survey that there was too much bureaucracy related to obtaining EU funding for the support of agrotourism.

In the 2014-2020 budgetary perspective, the development of agrotourism is realised under the sixth PROW priority *Social inclusion, reduction of poverty and promotion of economic development in rural areas*, under the measure *Development of farms and economic activity*, submeasure *Assistance for business start-up for non-agricultural activity in rural areas*. Beneficiaries must be natural persons. This submeasure has been allocated a total of €414m in the budget, with a maximum possible grant of 100,000 PLN. There is also a possibility of support for agrotourism under the Leader programme. In that case, subsidy will be given only to local authorities in connection with the development of public and non-commercial tourism infrastructure. Support for tourism-related actions can also be sought under the measure *Basic services and renewal of localities in rural areas*. According to some researchers (Siemiński and Poczta 2014), opportunities for support for the development of agrotourism will probably be less favourable in this period. This is due to the greater concentration of support for the development of areas related to agrotourism, namely infrastructure, through local authorities. On the other hand, the absence of tourism infrastructure in the region seems to be the greatest barrier to the further development of agrotouristic activity. Hence, the present changes to the CAP have the aim of meeting those needs, enabling making better use of the existing touristic potential of particular regions. It can be stated overall that the CAP instruments relating to the development of agrotourism have led to an improvement in the tourist base and infrastructure and a better matching of services to tourists' needs, creating an impulse for the further development of the tourist and recreational functions of rural areas¹³⁰.

¹³⁰ This is also confirmed by the results of other studies which show that, for example, in the powiats of the Polish Carpathians, the use of assistance funds by agrotourism farms was widespread, particularly in the case of farms with marginalised agricultural production (Bogusz and Kielbasa 2014).

Empirical research

The sociodemographic structure of the surveyed farms was evaluated using the following variables: gender of farm owners, number of family members, educational level of the respondents, and age of farm owners. The largest groups of respondents consisted of persons with high school education aged 46-55 (29%) and with vocational education aged 56-65 (17%). Graduates accounted for 9% of the respondents in the 46-55 age range. High rates of agrotouristic activity among farmers were recorded in the age ranges 46-55 (51%) and 56-65 (37%). This may result from the fact that, firstly, such people have a stable material and family situation, particularly older persons who are no longer bringing up children and are more willing to devote their free time to receiving tourists. Secondly, they have living conditions suitable to receive guests. They are also seeking additional sources of income (besides agricultural activity; and the products produced on the farm significantly increase the attractiveness of the agrotouristic services offered, determining their unique rural character), and they have concrete professional ambitions – they wish to realise their own interests.

Farm area is a factor that leads to differences in the levels of income from agricultural production. The question arises of whether this is also a factor affecting the income of agrotourism farms. In the survey, with regard to the specific nature of the activity of such farms, they were classified in the following area ranges: up to 5 ha, above 5 to 10 ha, above 10 to 20 ha, and over 20 ha (Fig. 4.1.).

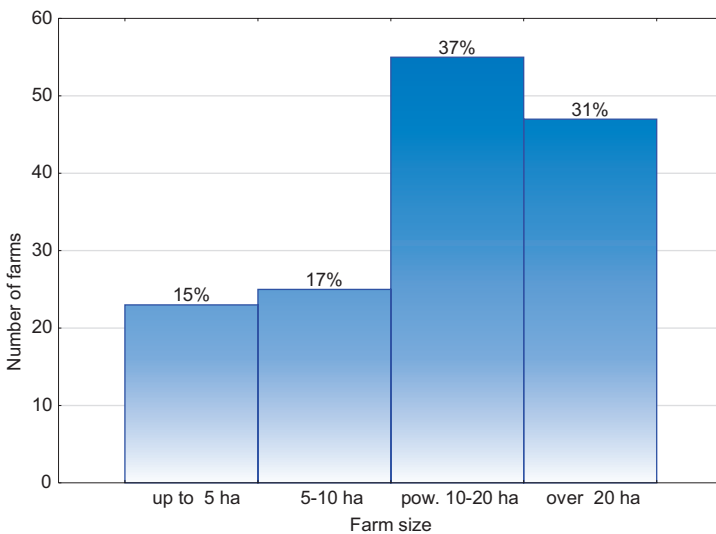


Figure 4.1. Histogram showing the breakdown of the surveyed farms carrying on agrotouristic activity by area of used land (n=150)

Source: based on the survey results

The largest number (37%) of surveyed farms engaged in agrotouristic activity had sizes of 10-20 ha, while 32% had areas up to 10 ha, and 31% above 20 ha. It can therefore be stated that, compared with the national standard, these were relatively large farms, although on the other hand, this structure matches the overall situation in the region of West Pomerania. The average size of a farm among the surveyed agrotouristic units was 14.97 ha, and the coefficient of variation of farm size was 54%. This results from the significant differences between the surveyed farms in terms of area of agricultural land used, including outlier observations, which increased the mean¹³¹.

The condition of agrotourism farms and the quality of the services provided are dependent on the experience of the persons engaged in that activity. Among the surveyed farms in West Pomerania, 57% of the respondents had been engaged in agrotouristic activity for between 4 and 8 years, while 31% had been providing such services for more than 8 years, and only 11% of farm owners had been engaged in such activity for less than 4 years. Overall, the surveyed farms had been engaged in agrotouristic activity for 1 to 17 years, with the largest number (24 farms) reporting a period of 6 years. It was also found that 50% of the farms had been engaged in such activity for less than 7 years, and 50% for more than 7 years. These data indicate that those running the surveyed farms had relatively long experience in agrotouristic activity, which can be expected to translate into a high standard of service and higher incomes.

The incomes of Polish farms are strongly differentiated, as is strongly confirmed by the Polish FADN accounting results. The level of income is affected by a number of factors, the most important being natural contracts, farm productive potential, intensity of production, and CAP subsidies (Czyżewski, Smędzik-Ambroży 2016). Income¹³², as an important economic category, determines the standard of living of rural communities, affecting their consumption, development and accumulation. It can occur in both financial and natural form (Woś and Tomczak 1984; Zegar 2001). Income is obtained by a family or by a farm through labour, which creates economic value, and the income results from the reward for that labour (Laskowski 2001). As a rule, farmers base their livelihood on many sources, which apart from agriculture-related income also include income from agrotouristic activity, paid labour, disability and old-age pensions, and non-agricultural business activity.

¹³¹ There were four outlier observations in total – farms for which the agricultural land area exceeded 100 ha.

¹³² Agricultural income is the effect of a farmer's labour on the farm, plus rent from ownership of factors of production (Adamowski 1984). Income can be said to be the main goal of the economic activity of people and firms (Rojewski, Rychlik, Stańko 1987).

The respondents declared that the percentage of their total income accounted for by income from the farm ranged from 0 to 90%, with a mean of 55.9% and a coefficient of variation of 43% (Table 4.19.). The second largest item was income from agrotouristic activity, with a mean of 23.8% and a relatively high coefficient of variation of 62%. A significant amount of income (10.9% on average) came from paid labour. Additional sources of livelihood in the form of “other” income (average 2.4%), social welfare payments (old-age or disability pensions – average 1.3%) and income from non-agricultural business activity (1.2%) were much lower. A large coefficient of variation is noted in the case of these forms of income, which should not come as a surprise, in view of the lower average values and consequent greater differentiation in these income sources.

Table 4.19. Descriptive statistics of the contributions of particular income sources to the overall income of the surveyed farms engaged in agrotouristic activity (2012; n=150)

Item	Mean (%)	Standard deviation (%)	Coefficient of variation ¹ (%)
Running of farm	55.9	23.9	43
Agrotouristic activity	23.8	14.8	62
Paid labour	10.9	19.4	178
Casual labour	2.5	6.8	277
Income from associated services	2.4	5.4	22
Other	2.0	6.9	343
Social welfare (old-age/disability pensions)	1.3	5.7	451
Non-agricultural business activity	1.2	6.8	548

¹ coefficient of variation = standard deviation / arithmetic mean (%)

Source: based on the survey results

The breakdown of income sources described above indicates that agrotouristic activity is supplementary to agricultural income.

The application of the EU’s CAP instruments to Polish agriculture was a significant element in improving the economic situation of farms. The development opportunities of farms are dependent to a relatively small extent on the creation of production values, and to a greater extent on the institutional factor (chiefly direct subsidies) and the abilities of farmers to obtain financial support from EU funds.

Among the surveyed farms, 91.3% took advantage of direct subsidies, while 8.7% of the respondents did not receive such subsidies. The structure of the amounts of direct subsidies is shown in Fig. 4.2. The greatest numbers of surveyed units received amounts of subsidy up to 10,000 zloty (PLN) (35%) or in the range 15-20,000 PLN (24%). The smallest group (5%) was receiving amounts of subsidies in excess of 60,000 PLN. This distribution results from the areas of the surveyed group of farms. The average level of area payments was approximately 24,000

PLN (median 17,000), with a coefficient of variation of 92%, which results from the diversified structure of the surveyed farms. It should be noted that the size of the coefficient of variation results from the fact that the surveyed farms included a few units which receive higher area payments, and thus increase the mean and the coefficient of variation. The majority of the surveyed farms (61%) used 90-100% of their direct subsidies for current expenditure relating to business activity, including agrotourism. This shows that among the surveyed units direct payments fulfil productive functions in most cases, stimulating economic activity. At the same time, 61 of the surveyed farms also received subsidies on account of engagement in agricultural activity in less favoured areas (LFAs). The overall goal of the subsidisation of those areas is to stop their depopulation, maintain their vitality, and counteract the ecological degradation of agricultural land and the degradation of the landscape and cultural values of the countryside. An additional benefit of this action is the stimulation of the application of good agricultural practice, which will lead to an increase in farmers' ecological awareness. The average amount of subsidies in this category was 4800 PLN, this constituting an additional element of income support for the surveyed farms.

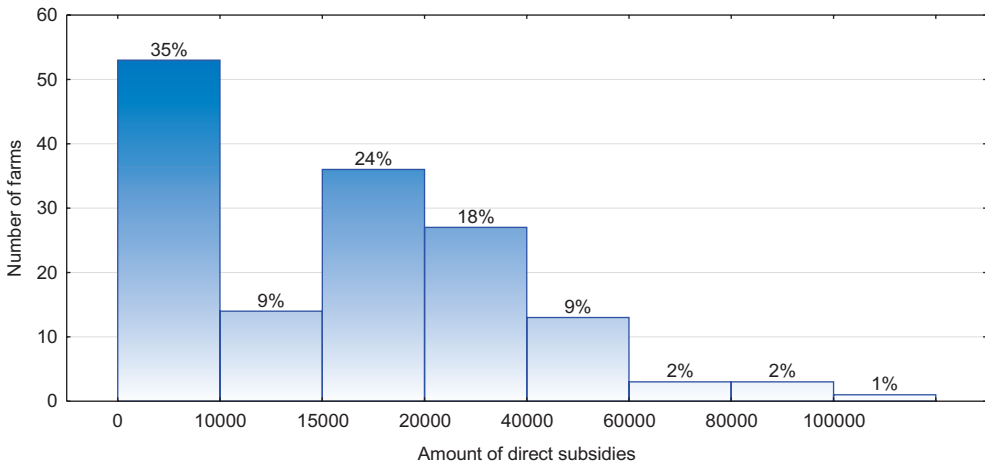


Figure 4.2. Structure of the amounts of direct subsidies received by the surveyed farms engaged in agrotouristic activity (2012; n=150)

Source: based on the survey results

The survey shows that in 2004-2006 in West Pomerania the subsidisation of agrotourism under the measure *Diversification of agricultural and related activity to ensure variety of activity or alternative sources of income* (SOP 2004-2006) was

used by only five of the surveyed farms, 3.3% of the total, while the PROW 2007-2013 was used by 79 farms, which is 52.6% of the total number. The level of activity of those running the surveyed farms in obtaining funds for the development of agrotourism was therefore high, and gives a positive picture of the potential of those farms for further development. Items of importance for the owners of agrotourism farms include not only the natural features of an area and adequate tourism infrastructure, serving to attract potential agrotourists, but also the assistance funds which facilitate raising the tourist base to appropriate standards. On the other hand, interest in this programme was limited, in the opinion of the respondents, by the excessive bureaucratic procedures and by the restrictions on the items on which the funds could be spent.

The volume and structure of production are determined partly by the farmers themselves, guided chiefly by financial and market motives, and also by the limitations resulting from their level of qualifications or the productive potential of farms (Majewski and Dalton 2003; Zachariasse 1977). The analysis showed the average total revenue (from agricultural and agrotouristic activity) of the surveyed farms to be 212,200 PLN, of which 23% came from agrotouristic activity and 77% from agricultural activity (Table 4.20.). Revenue from the sale of plant products was the main source of revenue. Other important components of the farms' revenue from agricultural activity were direct subsidies, revenue from service activity related to agricultural production, and livestock production. The main items of revenue from agrotouristic activity were room rent, sale of meals, and grants. This revenue structure indicates that EU funds are of relatively high importance in the functioning and development of this group of farms. Grants made up an average of 15.3% of revenue from agrotouristic activity, and 18.5% of revenue from agricultural activity. In the case of agrotouristic activity the support was allocated chiefly to the adaptation of residential buildings for touristic purposes, the purchase of touristic and recreational equipment, and fitting out additional rooms for guests. The funds allocated under the CAP to agriculture and other forms of economic activity in rural areas (agrotourism) lead to an improvement in efficiency and productivity and are a stimulus for structural changes in this sector of the economy (Sadowski and Gizycka 2012).

The total income from agricultural and agrotouristic activity on the surveyed farms averaged at 140,800 PLN, of which 27% came from agrotouristic activity and 73% from agricultural activity (Table 4.21.). This shows that agricultural activity remains the main source of income for these farms.

Table 4.20. Revenue from agrotouristic and agricultural activity on the surveyed farms ('000 PLN per farm) (2012; n=150)

Revenue from agrotouristic activity	Mean (PLN)	Standard deviation (PLN)	Coefficient of variation (%)	Proportion of total revenue (%)
Room rent	25.74	24.01	93	53
PROW grant ¹	7.50	8.40	112	15
Sale of meals	9.59	11.81	123	20
Sale of associated services	5.97	13.08	219	12
Total revenue from agrotouristic activity	48.81	39.64	81	100
Sale of plant products	87.53	75.81	88	54
CAP grants ²	6.82	12.04	176	4
Machine/horse services	25.24	46.22	183	16
Direct subsidies	21.13	21.75	103	13
Sale of animal products	20.00	36.18	190	12
LFA payments	2.29	5.22	228	1
Insurance received	0.39	2.47	628	0
Craft revenue	0.01	0.10	1225	0
Sale of timber	0.01	0.08	1225	0
Total revenue from agricultural activity	163.42	134.37	82	100

¹Funds under the measure *Diversification of agricultural and related activity to ensure variety of activity or alternative sources of income*

²CAP grants from the second pillar for farms (excluding LFA subsidies) relating to agricultural activity (i.e. excluding the measures *Diversification towards non-agricultural activity* and *Creation and development of micro-enterprises*)

coefficient of variation = standard deviation / arithmetic mean

Source: based on the survey results

Table 4.21. Average income on the surveyed farms from agrotouristic and agricultural activity ('000 PLN per farm) (2012; n=150)

Income	Mean (PLN)	Standard deviation (PLN)	Coefficient of variation ¹ (%)	Proportion of total revenue (%)
Total income from agrotouristic activity	38.30	34.09	89	27
Total income from agricultural activity	102.17	95.18	93	73
Total income	140.48	101.80	72	100

¹coefficient of variation = standard deviation / arithmetic mean

Source: based on the survey results

It should also be noted that the level of income of the surveyed farms was approximately 2% higher than the average income of Polish households as shown

by research of the Central Statistical Office (GUS) on budgets, which means that on average these were units which obtained incomes slightly in excess of parity¹³³.

An analysis was then made of the influence that CAP instruments have on the economic situation of the surveyed farms. It was found that the effect of subsidies related to agrotourism on the income from such activity was statistically insignificant ($p > 0.3$). As a rule, the farms that were the greatest beneficiaries of this support did not attain the highest incomes. This means that units which already enjoyed a sufficient level of development of agrotouristic activity in terms of the creation of income were less interested in this type of support (47% of the surveyed farms); this is linked to the criteria for granting such assistance, which favoured farms with relatively small areas of agricultural land, or not making use of other measures (e.g. *Modernisation of farms*). Other studies have shown (Brelík 2015, p. 249) that the levels of income from agrotourism are determined chiefly by environmental values, and hence by public goods located in a farm's vicinity.

It was found, among the group of surveyed farms, that total income (from agricultural and agrotouristic activity) was most strongly determined by the level of direct subsidies (Table 4.22., coefficient β), and by the support for agricultural activity under the PROW (chiefly the measures titled *Modernisation of farms* and *Agro-environmental programme*). This is also confirmed by the coefficients of partial correlation between these variables¹³⁴. The strength of this effect was quite large. In turn, the effect of subsidies intended to support agrotouristic activity and of LFA payments proved to be statistically insignificant. This resulted from the relatively weaker importance of these forms of support in conditions where income from agricultural activity is dominant. On the other hand, the survey shows that revenue from direct subsidies is also used to develop agrotouristic activity, chiefly in the area of current expenditure. Farmers have a wide discretion in allocating those funds, and can use them to develop agrotouristic activity if the farm is active in that area. Consequently, such farms' mechanisms of adaptation to market conditions have become more complex, and at the same time the risk associated with their economic activity has been diversified.

¹³³ This also results from the fact that farms additionally obtained income from other sources, which increased their total income.

¹³⁴ The coefficient of correlation between total income levels (from agriculture and from agrotouristic activity) was 0.5 and was found to be statistically significant.

Table 4.22. Results for the regression model, using income (from both agricultural activity and agrotourism) among the surveyed farms as the dependent variable (2012; n=150)

Item	Summary of regression: Dependent variable: total income; linear model R ² = 0.49867255 corr. R ² = 0.48445049 F(4.141)=35.063 p<0.0000 standard error of estimation: 68115 omit cases ¹ : 17;102;104;109; n=146					
	β	st. err. β	b	st. err. b	t	p
Free term			62213.23	9042.933	6.879763	0.000000
Direct subsidies	0.535905	0.066982	3.03	0.379	8.000772	0.000000
LFA	0.054588	0.061530	0.99	1.115	0.887175	0.376495
Support for agricultural activity from PROW	0.260914	0.067605	2.05	0.532	3.859379	0.000172
Support for agrotouristic activity	0.060098	0.060195	0.73	0.727	0.998404	0.319794

¹Outlying observations were omitted from the analysis. In this case, these were farms with more than 100 ha of agricultural land in use

Bold type marks – statistically significant values

Source: based on the survey results

Conclusions

The results of the survey made it possible to verify the proposed research hypotheses. The first hypothesis was not found to be correct. It turned out, as an initial finding, that support for agrotouristic activity did not have a significant effect on the level of income from agrotourism among the group of surveyed farms. This resulted from the fact that the farms that were interested in this type of support were those which had not yet obtained relatively high levels of income from agrotourism. Moreover, this instrument was not of a universal nature, but required the fulfilment of specified conditions. It may be expected that a similar situation existed on a national scale. To confirm the results from this research, it should be repeated in the coming years, taking account of the time shift between obtaining the support and the effects in the form of income.

The second hypothesis, stating that it is direct subsidies which affect the level of total income (from both agricultural and agrotouristic activity) to the greatest degree, was confirmed. This results from the universal nature of this instrument and its flexibility in terms of the use to which the funds are put. It should be remembered, however, that the relationships between agriculture and agrotourism are of a symbiotic nature. Their common plane includes both the income of households engaged in agricultural and agrotouristic activity, and the support available from

CAP instruments. Consequently, the preliminary conclusion can be drawn that direct subsidies favour the economic activation of farms as regards non-agricultural activity.

It can be expected that further changes to the instruments of the EU's Common Agricultural Policy will favour the creation of public goods at local authority level more than the development of agrotouristic activity at farm level. This should cause public goods to be valued to an even greater degree, providing opportunities for farms seeking additional income in agrotourism. For this reason, direct subsidies will continue to be a significant element in the development of this type of activity.

Summary: Political Rents and the European Model of Agriculture

(Anna Matuszczak¹³⁵)

To make a summary of a book that contains so many different threads is no easy task. One should, on the one hand, refer to its conceptual contribution to the paradigm of sustainable agriculture, and on the other hand, consider the conclusions drawn from the studies conducted at international, national and regional level. It is clear that changing the paradigm of agricultural development from an industrial to a sustainable one will be neither easy nor quick. Agriculture must satisfy the demand for food products while lowering the pressure on the environment, providing for technological and biological progress, meeting the need to ensure a secure supply of food, and ensuring global economic, social and environmental rationality.

The discussion in this book has concentrated chiefly on the last two questions. This is because certain dimensions of environmental and social rationality have so far been poorly researched. Environmental rationality means not only protecting the natural environment and reducing the pressure placed on it by agricultural production. The authors have pointed out that the assumption of an intrinsic value of land changes the expected productivity of capital in the sectors which utilise that production factor, namely in agriculture. This has far-reaching theoretical and practical consequences. The statistical data that have been presented demonstrate that utilities are discounted in Polish land prices to a much greater degree than would result from the agricultural functions of land. A similar situation is found in other EU countries. Where does this excess value of land come from? It is undoubtedly a result of the expectations of political rents, of speculative motives, and also of non-agricultural amenities provided by land. However, it is hard to determine the proportions of these factors. Moreover, new utilities of land have the nature of public goods, which further complicates the problem of seeking a market equilibrium. Similarly, recognition of the fact of the absolute and relative deprivation of farmers in the long term changes the balance of intersectoral flows, because it means a drainage of surplus from agriculture to other branches of agribusiness. This drainage is understood as a permanent mechanism by which economic rent flows out of agriculture as a result of market imperfections, in particular the flexible prices of agricultural products. More space should be given to studies of this problem in the world literature.

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The second thread of the theoretical considerations relates to the problem of whether the concept of political rent, as found in the literature, fits the processes taking place in European agriculture. A review of the literature on rent seeking suggests that these theories provide only a partial explanation of the level of political rents and lobbying actions in European agriculture. Although there is a vast theoretical literature on rent seeking and collective action at global level, there is not much empirical work done with regard to these problems relating to the Common Agricultural Policy. Particularly problematic is the question of measuring political rents in particular EU member states. It has been found that, on a global level, it is European agriculture that best meets the criteria of viability and sustainability. Viewed against the backdrop of global agriculture, it is economically effective (in the institutional conditions guaranteed by the CAP), satisfies a variety of economic and social needs, and is developing in a way that reduces the burden on the environment. In 2012, based on the results of social consultations, the European Commission published a strategy and plan of action relating to the bioeconomy in Europe. The strategy creates a cohesive framework for a comprehensive approach to the solution of complex social problems (challenges) in Europe and worldwide. The measures undertaken with respect to the bioeconomy are focused on three pillars: investment in research, innovations and skills; strengthening the impact of the policy and engagement of interested parties; and strengthening competitiveness in sectors of the bioeconomy. The bioeconomy strategy represents an important step towards solving contemporary economic and social problems. The model of the development of agriculture in the EU can thus be considered an appropriate path to be followed in relatively densely populated countries, in which food producing area per capita is small. However, does this model require institutional support and the payment of political rents? The question arises as to whether these are in fact political rents, if in return society receives a package of specified benefits, and there is a net increase in social well-being.

Empirical analyses have shown that up to the mid 1980s the level of support for agriculture in the EU (measured by the NRA indicator) was constantly increasing. The decline in support in subsequent years was maintained by payments of the decoupled type. Based on NRA values it can be concluded that nominal support in 2011 was at a level comparable to that recorded prior to the creation of an organisation of agricultural markets, that is, before 1962. This means that the CAP is distorting world prices to an ever smaller degree, and agricultural producers are losing their competitive advantages (although to differing extents). An important observation is the fact that, although the CAP applies to all member states, the level of support varies between those countries. In 2005-2011 it was the highest in Ireland, Slovenia, Poland, Belgium and the UK, and the lowest in Italy and Bulgaria. This observation

is confirmed by a second indicator constructed for the purposes of this research by the authors of Chapter 2.3 – the Farm Receipts Gap Estimate (FRGE). Despite the fact that in principle agricultural policy has a universal application, the amount of financial support given to agricultural producers measured as a percentage of gross farm receipts is not uniform between countries, with differences as high as 17 percentage points in 2012¹³⁶ (cf. Table 2.4.). We should add that, according to the OECD, the value of the PSE for the whole of the European Union is 22.6% (of gross receipts). The differences between the PSE and the FRGE result partly from the methodology used for calculation. Most importantly, however, the FRGE shows how little uniformity there is across the EU in terms of support for agricultural producers in different countries. The differences are even more marked when we consider the contribution of pure political rent¹³⁷ to the revenue of producers in various countries. In the Netherlands this contribution is just 4.3%, while for Ireland it is 25.8% (although the highest value, 28.7%, is recorded in Finland; cf. Table 3.12.). These data also demonstrate one more thing: that the PSE should not be used as a measure of political rents, because it significantly overstates them. The mechanisms shaping the structure of transfers in the selected countries also exhibited clear differences. This applies in particular to the two main streams of transfers: from taxpayers to producers and from consumers to producers. There has also been a gradual change in the structure of support, away from consumer transfers towards taxpayer transfers. This has resulted both from changes taking place in the global economy and the rise in prices of agricultural products, as well as from transformations in agriculture's role in the economy.

A key part of the book proved to be Part 3, which presents the concept and the effects of long-term surplus drainage from agriculture under the various support models applied in the EU as regards equivalent payments (for specific public goods) and the different models for the taxation of agriculture. The analysis leads to what are called pure political rents, being what remains when the value of the aforementioned flows (drainage and net subsidies for public goods) is deducted from the sum of CAP subsidies. It should be noted that only rents calculated in this way meet the definition of political rent found in the public choice theory.

Another important thread in this discussion concerns price fluctuations and their consequences. Agriculture is characterised by a high variability of prices in particular markets, which leads to adjustments of supply. This reaction is not always as described by neo-classical concepts – the spider's web and King's effects. Farmers' expectations in different countries may be more or less adaptive, and are sometimes

¹³⁶ From 19.99% in the Netherlands to 36.96% in Ireland.

¹³⁷ After adjusting the support by that part the receipt of which is conditional on the supply of specified public goods, and by the value of long-term drainage resulting from market failures.

rational. This depends on the degree of horizontal and vertical integration of sale channels, and on access to information. This price variability leads to unexpected flows of economic surplus into and out of agriculture, and in the authors' view, this produces a drainage effect in the long term. In response, there is a fluctuation in economic activity and in the economic situation in agriculture. This process is not uniform, however, and varies between different EU countries, as the authors observe. They propose an economic indicator based on surplus flows as a result of price fluctuations, based on an input-output table. The largest fluctuations were recorded in such countries as Germany, Denmark, the Czech Republic, Slovakia, Estonia and Lithuania. At the other extreme (with the smallest amplitudes of variation) are Portugal, Greece, Cyprus and Malta. At the same time, the value of the computed indicator determined the changes in farms' output and receipts, although in some countries this was a concurrent response, while in others it was delayed. This partly confirms the hypothesis that the outflow of economic rent from agriculture means a drop in productive activity, and vice versa (in some cases, however, such as in Poland, the response was delayed – recalling the spider's web theory). It was also shown that the relationship between the economic indicator and the production of agricultural raw materials differs between countries. In Germany, for example, the variation in output as a response to price changes is relatively low. Even in the most difficult period for agriculture (2009) production fell there by just 1%, compared with 15% in Portugal and as much as 30% in Poland, despite a smaller drop in the economic indicator. The authors believe this to be a result of the different agrarian structure, scale and technology of production, differences in the functioning of market institutions (integrative links, contracting systems), and the reactions of the producers themselves to the situation. To sum up, drawing conclusions about the general economic situation based on flows of economic rents is an atypical approach, but one that can identify the causes of variation in the productive activity on farms and help compare the scale of such variation between countries. This approach may also be a useful analytical tool for agricultural policy, which becomes particularly important in conditions of the intensification of processes of globalisation.

In generalising the conclusions drawn from the analysis of the structure of CAP support in selected EU countries, three different models were identified¹³⁸. Only

¹³⁸ The structure of support is described based on the contribution of the following variables to total variable subsidies: X1 – the value of payments for public goods, being the sum of set-aside, agri-environmental and less favoured area payments and other subsidies for the development of rural areas; X2 – the value of subsidies for plant and animal production (the sum of other payments to plant and animal production plus the balance of subsidy and penalties for milk production, subsidy for other cattle production and subsidy for sheep and goat production); X3 – the value of single farm and area payments; X4 – the value of subsidies for indirect consumption; X5 – the value of investment subsidies.

two of them – model A (dominated by single farm and area payments, and with payments for the supply of public goods making up 17% of the total) and model C (combining different mechanisms of support for farms, with the highest contribution from payments for public goods, 33%) – were in accordance with the development priorities of the European agricultural model as defined in the new programming period of 2014-2020. These operated throughout most of the area of the EU in 2012, particularly in the new member states (cf. Figure 3.3.). Nonetheless, in most regions of the “old” EU-15 member states, the model in operation in 2012 was model B, oriented exclusively towards direct payments, which are treated as a substitute for support for production and produce a relatively weak stimulus for sustainable development. Further calculations showed that these countries receive more than 80% of the pure political rents derived from the CAP.

There is also a large variation between EU countries as regards agricultural income. The tax systems applied to agriculture, however, are very similar (with certain exceptions, such as the case of Poland). They incorporate taxes on income, assets and consumption (VAT). The Polish system is different in that it does not include a tax on income from agricultural production. Based on an evaluation of the tax systems applied to agriculture in selected EU countries, it is possible to identify countries having the most restrictive tax policies towards agriculture (Belgium, Portugal, Ireland, Spain) and those where such policies are less restrictive (the UK, Germany, Italy, the Netherlands).

Taking account of the long-term surplus drainage from agriculture and the net equivalent subsidies (in exchange for specific actions relating to public goods), an estimate was made of the value of “pure” political rents for individual countries of the EU-27. The analysis carried out here points to the conclusion that agricultural interventionism in the EU requires a special conceptual approach, since it is not sufficient to simply treat all subsidies as political rents. The new approach proposed by the authors is necessary, as it provides an indication of how to improve the effectiveness of allocation of support for agriculture in individual EU countries. Quantification of the political rent in agriculture enables a more rational and socially appropriate distribution of assistance from the CAP in accordance with the goals set for agricultural policy in the new financial framework after 2014. Although the division of payment envelopes between member states has already been decided, since 2014 the CAP has gained flexibility in terms of the structure of both pillars and transfers between them. These matters remain in the hands of the governments of member states.

Another issue is the aforementioned contribution of political rents to the gross receipts from agriculture in a given country (cf. Tables 3.12. and 3.13.). On average in the EU-27 this contribution is 13.63%, and although in the EU-12 it is slightly

higher, and in the EU-15 somewhat lower than average, there are countries in which that value is exceeded almost twofold. Redefinition is required as regards the issue of social fairness in the determination of the sizes of national CAP envelopes. The calculations of political rents show that historical payments are neither a rational nor a just solution, because the structurally low profitability of agriculture in certain countries should be compensated for by a higher supply of public goods, and this is not happening. Perhaps countries with structurally inefficient agriculture should supply more public goods than they do at present, if they wish to maintain their current ratio of political rents to gross added value, or else subsidise their agriculture to a greater degree out of national funds.

Part 4 of the book contains case studies. These demonstrate the applicative dimension of the paradigm of sustainable development and methods of evaluating the effectiveness of agricultural policy in supporting such development in rural areas. Naturally, the results of these studies are not representative for agriculture as a whole (at national or EU level). Nonetheless, they indicate a direction for discussion concerning the development of sustainable agriculture in theory and in practice, and provide methodological guidance. They develop a methodology for examining regional sustainable development, which enables not only a sustainability assessment, but also a comparison of synthetic indicators over the whole of the analysed period. Also a set of analytical models is proposed, which make possible not only a better management of human and material capital in firms in agricultural and food sectors, but also the identification of areas that need to be improved to enable these resources to be used more competitively. Among the detailed findings, the following are particularly striking:

- The location-specific factor “type of rural area”, based on land functions, is of key importance for land value in the SAPS. The area type determines whether particular use values, such as area or shape coefficient, and amenities, such as the possibility of building, as well as payments under agricultural policy, affect the land price.
- There is a very large variation in land prices in the SAPS, and prices are strongly affected by speculation, which has driven the upward trend since the introduction of area payments in 2004. However, the impact of speculation is relatively small in areas with agrotouristic features.
- Agricultural policy, in particular payments for public goods, has a very large significance (marginal effects) for the value of agricultural land compared with other parcel-level attributes of properties.
- Payments for public goods are however capitalised in land prices only in peripheral areas. Elsewhere they fail to perform their role, and are even associated with the decapitalisation of the value of land. In particular, in

agrotouristic areas these schemes should be complementary and not substitutive with respect to the multifunctional development of the countryside. Therefore, in most places at present, single area payment support is not a differentiating factor for land value, in view of its general availability and low requirements, and the other payments do not compensate for the opportunity costs related to alternative ways of deriving rent from land.

- Similarly, support for agrotouristic activity did not have a significant effect on the level of income from agrotourism among the analysed farms. This was because interest in such support came from those farms that did not yet obtain relatively high amounts of income from agrotourism; and moreover the instrument was not of a universal nature, but required the fulfilment of specified conditions. It can be expected that the situation was similar throughout Poland.
- The relationships between agriculture and agrotourism are symbiotic in nature. Their common plane includes both the income of farms engaged in agricultural and agrotouristic activity, and the support provided by CAP instruments. In consequence, the preliminary conclusion can be reached that direct subsidies favour the economic activation of farms in non-agricultural activity.
- The instruments of the CAP can be expected to evolve to favour the creation of public goods at local authority level rather than the development of agrotouristic activity itself at farm level.

A particularly striking aspect of the findings of these case studies is that they point towards a common problem: the idea of payments for public goods under agricultural policy is set forth as a leitmotif of the European agricultural model, but in practice the CAP does not succeed in valuing these goods accurately. Perhaps this value is too low compared with the funds allocated indirectly to support production and efficiency, perversely given the name “decoupled”? Hence, the idea remains more a declaration than reality. This conclusion is confirmed by the variation in pure political rents obtained by agriculture (one might say non-equivalent rents) between EU countries in 2004-2012: ranging from approximately 9% of value added by agriculture in the Netherlands, to over 95% in Ireland. Are such disproportions, which it is hard to justify by any objective criteria, acceptable from the point of view of social justice and common community ideology? Alluding to the hypothesis put forward at the outset: there is something called the European model for the development of agriculture, but it is implemented in a minority of EU countries. Their common denominator is that pure political rent, after taking account of public goods and market corrections, accounts for a similar proportion of agricultural income.

Bibliography

- Adamowicz, M. (2005). Zrównoważony i wielofunkcyjny rozwój rolnictwa a agronomia. *Annales Universitatis Mariae Curie-Skłodowska*. Vol. LX. Section E. Lublin: 71-91. http://wydawnictwo.up.lublin.pl/Annales/Agricultura/2005/Annales_2005_agric_art_08.PDF (1.03.2016).
- Adamowicz, W.L. (1994). Habit Formation and Variety Seeking in a Discrete Choice Model of Recreation Demand. *Journal of Agricultural and Resource Economics*. No. 19(1): 19-31.
- Adamowski, Z. (1984). *Encyklopedia ekonomiczno-rolnicza*. Państwowe Wydawnictwo Rolnicze i Leśne. Warsaw.
- Agricultural Farm Income and Competitiveness of the Tax and Insurance System (2014). Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej – PIB. No. 121. Warsaw, and msp.Money.pl, (16.12.2016).
- Akerman, G. (1957). The Cobweb Theorem: A Reconsideration. *The Quarterly Journal of Economics*. No. 71: 151-160.
- Albert, M. (1994). *Kapitalizm kontra kapitalizm*. Signum. Kraków: 26.
- Alston, J.M., James, J.S. (2002). The Incidence of Agricultural Policy. [in] B.L. Gardner, G.C. Rausser (eds.). *Handbook of Agricultural Economics*. vol. 2B. Amsterdam: North-Holland.
- Alston, J.M., Norton, G.W., Pardey, P.G. (1995). *Science Under Scarcity: Principles and Practice for Agricultural Research Evaluation and Priority Setting*. Cornell University Press. Ithaca. New York.
- Altieri, M.A. (1995). *Agroecology: The Science of Sustainable Agriculture*. 2nd Ed. Westview Press, Boulder.
- Anderson, K. (2009). *Distortions to Agricultural Incentives: A Global Perspective. 1955-2007*. London. Palgrave Macmillan. Washington. DC. World Bank.
- Anderson, K., Nelgen, S. (2013). Updated National and Global Estimates of Distortions to Agricultural Incentives, 1955 to 2011. www.worldbank.org/agdistortions (1.03.2016).
- Anderson, K., Swinnen, J. (2009). Eastern Europe and Central Asia. [in:] Anderson, K. (2009). *Distortions to Agricultural Incentives: A Global Perspective. 1955-2007*. London. Palgrave Macmillan. Washington. DC. World Bank: 259-288.
- Anderson, K., Valenzuela, E. (2008). Estimates of Global Distortions to Agricultural Incentives, 1955 to 2007, www.worldbank.org/agdistortions (21.01.2016).
- Angrist, J. D., Kugler, A.D. (2008). Rural Windfall or a New Resource Curse? Coca, Income, and Civil Conflict in Columbia. *The Review of Economics and Statistics*. Vol. 90, No. 2.
- Anthopoulou, T. (2000). Agrotourism and the rural environment: constraints and opportunities in the Mediterranean less-favored areas. [in:] *Tourism and the environment. Regional, economic, cultural and policy issues*. Briassoulis H., Straaten J. (eds.). Springer-science: 371.
- Ardeni, P.G. (1989). Does the Law of One Price Really Hold for Commodity Prices? *American Journal of Agricultural Economics*. Vol. 71: 661-669.
- Ascham Associates (2010). *The Knowledge Based Bio-Economy towards 2020 – Turning Challenges into Opportunities*. Report of a conference held on 14th September 2010. Brussels. Belgium. Belgian Presidency in collaboration with the European Commission: 30. <http://www.kbbe2010.be/en/kbbe2010/about-kbbe/kbbe-conference-report> (1.03.2016).
- Atkinson, A., Stiglitz, J. (1980). *Lectures on Public Economics*, McGraw-Hill. New York: 483-487.

- Atkinson, G., Dubourg, R., Hamilton, K., Munasinghe, M., Pearce, D., Young, C. (eds.) (1997). *Measuring Sustainable Development, Macroeconomics and the Environment*. E. Elgar, Cheltenham: 252.
- Baik, K., Lee, S. (2007). Collective rent seeking when sharing rules are private information. *European Journal of Political Economy*. No. 23: 768-776.
- Baldock, D., Hart, K., Scheele, M. (2014). Dobra publiczne i interwencja publiczna w rolnictwie. www.enrd.ec.europa.eu (10.09.2014).
- Bárcena, A., Katz, J., Morales, C., Schaper, M. (2004). Los transgénicos en América Latina y el Caribe un debate abierto, *United Nations*. [in:] Economic Commission for Latin America and the Caribbean (Ed.). CEPAL. Santiago de Chile.
- Bardhan, P. (1997). Corruption and Development: A Review of the Issues. *Journal of Economic Literature*, No. 35.
- Barnard, C.H. (2000). Agriculture and the Rural Economy: Urbanization Affects a Large Share of Farmland. *Rural Conditions and Trends*. Vol. 10. No. 2: 57-63.
- Bateman, I.J., Carson, R.T., Day, B., Hanemann, M.W., Hanley, N., Hett, T., Jones-Lee, M., Loomes, G., Mourato, S., Özdemiroglu, E., Pearce, D.W., Sudgen, R., Swanson, J. (2004). *Economic Valuation with Stated Preference Techniques: A Manual*. Northampton, MA: Elgar.
- Baum, R. (2011). Ocena zrównoważonego rozwoju w rolnictwie (studium metodyczne). Wyd. Uniwersytetu Przyrodniczego w Poznaniu: 391.
- Baum, R., Śleszyński, J. (2009). Nowe funkcje rolnictwa – dostarczanie dóbr publicznych. *Stowarzyszenie Ekonomistów Rolnictwa i Agrobiznesu. Roczniki Naukowe*. Vol. XI(2).
- Baylis, K., Furtan, H. (2003). Free-Riding on Federalism: Trade Protection and the Canadian Dairy Industry. *Canadian Public Policy*. No. 29(2): 145-161.
- Bean, C.L. (1927). Agriculture and the Nation's Business. *Journal of Farm Economics*. Vol. 9. No. 7.
- BECOTEPS (2011). *The European Bioeconomy in 2030. Delivering Sustainable Growth by addressing the Grand Societal Challenges*. Brussels, Belgium. BECOTEPS – Bio-Economy Technology Platforms: 24. <http://www.fz-juelich.de/ibg/ibg-2/EN/News/docs/Bioeconomy-2010-2030.html> (1.03.2016).
- Bednarikova, Z., Jilkova, J. (2012). Why is the agricultural lobby in the European Union Member States so effective. *E+M Ekonomie a Management*. No. 2: 26-37.
- Begg, D., Fischer, S., Dornbusch, R. (1993). *Ekonomia*. T1. PWE. Warsaw.
- Bezat-Jarzębowska, A., and W. Rembisz. (2013). Political and economic rent as a source of income for the agricultural producer. [in:] *Economic, social and institutional factors of growth in the agri-food sector in Europe*. IERiGŻ PAN. Warsaw: 30-31.
- Bhaskar, A., Beghin, J.C. (2007). How coupled are decoupled farm payments? A review of the evidence Iowa State University, Department of Economics. Working Papers Series. Working Paper # 07021. August.
- Bianchi, R. (2011). From agricultural to rural: agritourism as a productive option. [in:] *Food, agriculture and tourism*. Sidali K. et al. (eds.). Springer. Berlin Heidelberg: 56-71.
- Blandford, D., Brunstad, R.J., Gaasland, I., Vårdal, E. (2008) Optimal agricultural policy and PSE measurement: an assessment and application to Norway. 82nd Annual Conference. March 31 – April 2. Royal Agricultural College Cirencester: 10.
- Blaug, M. (1997). *Economic Theory in retrospect*. Cambridge University Press. Cambridge: 82.
- Błażejczyk-Majka, L., Kala, R. (2005). Metody analizy skupień do charakterystyki użytków rolnych wybranych państw Unii Europejskiej. *Roczniki Naukowe SERiA*. Vol. VII. No. 5: 5-10.
- Błąd, M. (2010). Rolnictwo jako „przechowalnia” nadwyżek siły roboczej w okresie transformacji systemowej w Polsce. [in:] J. Wilkin (ed.) *Wielofunkcyjność rolnictwa. Kierunki badań*,

- podstawy metodologiczne i implikacje praktyczne. Instytut Rozwoju Wsi i Rolnictwa Polskiej Akademii Nauk. Warsaw: 188.
- Bogusz, M., Kielbasa, B. (2014). Źródła finansowania i kierunki inwestycji w wybranych gospodarstwach agroturystycznych położonych na obszarze polskich Karpat. *Problemy drobnych gospodarstw rolnych*. No. 1.
- Bogusz, M., Paluch, Ł. (2011). Ocena wykorzystania funduszu UE w rozwoju przedsiębiorczości na obszarach wiejskich województwa małopolskiego. *Roczniki Naukowe SERiA*. Vol. XIII. No. 1:39.
- Bołtromiuk, A. (2011). Uwarunkowania zrównoważonego rozwoju gmin objętych siecią Natura 2000 w świetle badań empirycznych. IRWiR PAN. Warsaw: 44.
- Borys, T. (1998). Jak budować program ekorozwoju. *Informacje ogólne*. Regionalny Ośrodek Ekorozwoju Fundacji Karkonoskiej w Jeleniej Górze. Warsaw–Jelenia Góra: 11.
- Borys, T. (2009). Problemy zrównoważonej konsumpcji. [in:] B. Fiedor, R. Jończy (eds.). *Rozwój zrównoważony, teoria i praktyka*. Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu. Wrocław: 54.
- Boulanger, P. (2010). Distribution of agricultural support: Selected French evidences. *Groupe d'Economie Mondiale (GEM)*. Sciences Po. Paris.
- Boyle, K.J., M.P. Welsh and R.C. Bishop (1993). The Role of Question Order and Respondent Experience in Contingent- Valuation Studies. *Journal of Environmental Economics and Management*, 25(1): 80-99.
- Brady, M., Kellermann, K., Sahrbacher, Ch., Jelinek, L. (2009). Impacts of Decoupled Agricultural Support on Farm Structure, Biodiversity and Landscape Mosaic: Some EU Results. *Journal of Agricultural Economics*. Vol. 60, No. 3: 563-585.
- Breffle, W.S., E.R. Morey (2000). Investigating Preference Heterogeneity in a Repeated Discrete-Choice Recreation Demand Model of Atlantic Salmon Fishing. *Marine Resource Economics*, 15(1): 1-20.
- Brelik, A. (2015). Dobra publiczne na obszarach wiejskich jako czynnik rozwoju działalności agroturystycznej na Pomorzu Zachodnim. *Wydawnictwo naukowe PWN*. Warsaw: 249.
- Brelik, A., Matuszczak, A. (2013). Issues of public goods in a multi-functional development of rural areas. *Economic Science for Rural Development*. No. 31: 28-32.
- Briggeman, B.C., Gunderson, M.A., Gloy, B.A. (2009). The Financial Health of Agricultural Lenders. *American Journal of Agricultural Economics*. Vol. 91. No. 5: 1406-1413.
- Brooke, G.T.F. (2010). Uncertainty, Profit and Entrepreneurial Action. *Journal of the History of Economic Thought*. Vol. 32. Cambridge.
- Brou, D., Ruta, M. (2013). Rent-Seeking, Market Structure, and Growth. *Scand. J. of Economics*, No 115(3).
- Brouwer, F. (ed.) (2004). *Sustaining Agriculture and the Rural Environment*. Edward Elgar. Cheltenham. Northampton.
- Buchanan, J.M. (1968). *The Demand and Supply of Public Goods*. Rand McNally. Chicago.
- Bullock, D.S., Garcia, P., Shin, K.-Y. (2005). Measuring producer welfare under output price uncertainty and risk non-neutrality. *The Australian Journal of Agricultural and Resource Economics*. Vol. 49: 1.
- Burt, O.R. (1986). Econometric Modeling of the Capitalization Formula for Farmland Prices. *American Journal of Agricultural Economics*. Vol. 68. No. 1: 10-26.
- Bühler-Natour, C., Herzog, F. (1999). Criteria for sustainability and their application at a regional level: the case of clearing islands in the Dübener Heide nature park (Eastern Germany). *Landscape and Urban Planning* 46(1-3): 51-62.
- Bywalec, C. (1995). W pętli paradoksów. *Nowe Życie Gospodarcze*, No. 15.

- Cameron, T.A., Englin, J. (1997). Respondent Experience and Contingent Valuation of Environmental Goods. *Journal of Environmental Economics and Management*, 33(3): 296-313.
- Capozza, D.R., Helsley, R.W. (1989). The Fundamentals of Land Prices and Urban Growth. *Journal of Urban Economics*. Vol. 26. No. 3: 295-306.
- Carreño, L., Frank, F.C., Viglizzo, E.F. (2012). Tradeoffs between economic and ecosystem services in Argentina during 50 years of land-use change. *Agriculture, Ecosystems & Environment*. Vol. 154: 68-77. <http://dx.doi.org/10.1016/j.agee.2011.05.019>. (1.03.2016).
- Carson, R., Louviere, J. (2011). A Common Nomenclature for Stated Preference Elicitation Approaches. *Environmental and Resource Economics*. No. 49(4): 539-59.
- Carson, R.T., Czajkowski, M. (2014). The Discrete Choice Experiment Approach to Environmental Contingent Valuation. [in:] *Handbook of Choice Modelling*. S. Hess and A. Daly (eds.). Northampton, MA: Elgar.
- Chatterjee, S., Hadi, A.S. (2006). *Regression Analysis by Example*. Wiley-Interscience. Hoboken. N.J.
- Cheikbossian, G. (2008). Heterogeneous groups and rent-seeking for public goods. *European Journal of Political Economy*. No. 24: 133-150.
- Chen, J.J., Collins, L.P.A. (2014). Let's Talk About the Money: Spousal Communication, Expenditures, and Farm Production. *American Journal of Agricultural Economics*. Vol. 96. No. 5: 1272-1290.
- Chmurzyńska, K. (2007). Stan realizacji sektorowego programu operacyjnego „Restrukturyzacja i modernizacja sektora żywnościowego oraz rozwój obszarów wiejskich 2004-2006”. [in:] *Wyniki realizacji PROW i SPO „rolnictwo” w latach 2004-2006*. Mułkowska M., Chmurzyńska K. (eds.). IERIGŻ. Warsaw: 72-73.
- Cholaj, H. (1966). *Cena ziemi w rachunku ekonomicznym*. PWE. Warsaw: 192.
- Choumert, J., Phélinas, P. (2015). Determinants of agricultural land values in Argentina. *Ecological Economics*. Vol. 110: 134-140.
- Cochran, W.W. (1958). *Farm Prices, Myth and Reality*. University of Minnesota Press. Minneapolis.
- Colwell, P., Dilmore, G. (1999). Who was First: An Examination of an Early Hedonic Study. *Land Economics*. Vol. 75: 620-626.
- Commission of the European Community (1985). *The Agricultural Situation in the Community 1983-4 Report*. Brussels, Luxembourg.
- Cooper, T., Hart, K., Baldock, D. (2009). *Provision of Public Goods Through Agriculture in the European Union*. Report Prepared for DG Agriculture and Rural Development. Contract No 30-CE-0233091/00-28. Institute for European Environmental Policy. London: 396. http://ec.europa.eu/agriculture/analysis/external/public-goods/report_en.pdf (20.02.2016).
- Coulson, E. (2008). *Monograph on Hedonic Estimation and Housing Markets*. Department of Economics. Penn State University.
- Czajkowski, M., Hanley, N., La Riviere, J. (2014). The Effects Of Experience On Preferences: Theory And Empirics For Environmental Public Goods. *Amer. J. Agr. Econ.* 97(1): 333-351. Doi: 10.1093/Ajae/Aau087 Published online 29 October 2014.
- Czternasty, W., Czyżewski, B. (2004). *Struktury instytucjonalne w mechanizmach alokacyjnych gospodarki rynkowej w okresie transformacji systemowej*. [in:] A. Noga (ed.). *Przemiany instytucjonalne w Polsce w okresie transformacji systemowej*. PTE. Warsaw.
- Czykier-Wierzba, D. (2012). *Początki Wspólnej Polityki Rolnej w EWG. Polityki Europejskie, Finanse i Marketing*. *Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie*. No.8 (57): 103-115.

- Czyżewski, A. (1995). Makroekonomiczne uwarunkowania przedsiębiorczości w agrobiznesie. (in:) *Rozwój rolnictwa i agrobiznesu w skali lokalnej*. A. Czyżewski (ed.). Wyd. Ośrodka Doradztwa Rolniczego w Sielinku. Poznań: 25-26.
- Czyżewski, A. (2005). Rolnictwo w procesie reprodukcji. Różne wizje dostosowań rynkowych, [in:] B. Klepacki (ed.), *Kwestia agrarna w Polsce i na świecie*, Wyd. SGGW, Warsaw: 127.
- Czyżewski, A. (2007). Makroekonomiczne uwarunkowania rozwoju sektora rolnego. [in:] A. Czyżewski (ed.). *Uniwersalia polityki rolnej w gospodarce rynkowej; ujęcie makro- i mikroekonomiczne*. Wyd. Akademii Ekonomicznej w Poznaniu. Poznań: 16, 21-22.
- Czyżewski, A. (2009). Potrzeba badań makroekonomicznych w gospodarce żywnościowej. *Roczniki Nauk Rolniczych*. No. 2. series G.
- Czyżewski, A. (2010). Optyka badań makroekonomicznych w gospodarce żywnościowej. in: Grzelak, A., Pająk, K. (eds.) *Nowe trendy w metodologii nauk ekonomicznych i możliwości ich wykorzystania w procesie kształcenia akademickiego*. vol. I: *Problemy ogólne metodologii nauk ekonomicznych*. Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu. Poznań: 67-68.
- Czyżewski, A. (2013). O nowy paradygmat rozwoju rolnictwa (refleksje nad książką J. St. Zegara "Współczesne wyzwania rolnictwa"). *Ekonomista*. No. 6.
- Czyżewski, A. (ed.) (2003). *Makroekonomiczne problemy agrobiznesu w Polsce w okresie przedakcesyjnym*. Wyd. AE w Poznaniu. Poznań. No. 30.
- Czyżewski, A. (ed.) (2007). *Uniwersalia polityki rolnej w gospodarce rynkowej. Ujęcie makro- i mikroekonomiczne*. Wyd. AE w Poznaniu, Poznań.
- Czyżewski, A., Czyżewski, B. (2014). A new paradigm of development as a modern challenge in agriculture. *Management*. Vol. 18. No. 1: 46-472.
- Czyżewski, A., Czyżewski, B. (2015). Ziemia i jej renty w nowym paradygmacie rozwoju rolnictwa. [in:] A. Czyżewski, B. Klepacki (eds.). *Problemy rozwoju rolnictwa i gospodarki żywnościowej w pierwszej dekadzie członkostwa Polski w Unii Europejskiej*. IX Kongres Ekonomistów Polskich. Wyd. PWE. Warsaw: 27-41.
- Czyżewski, A., Grzelak, A. (2012). Możliwości wykorzystania statystyki bilansów przepływów międzygałęziowych. *Przegląd Statystyczny*. Vol.1: 173-190.
- Czyżewski, A., Kułyk, P. (2010). Relacje między otoczeniem makroekonomicznym a rolnictwem w krajach wysokorozwiniętych i w Polsce w latach 1991-2008. *Ekonomista*. Warsaw. Vol. 2.
- Czyżewski, A., Kułyk, P. (2011). Public goods in multifunctional agricultural development. The attempt on problem conceptualization. [in:] *Selected problems of market economy in the crisis era*. D. Kopycińska (ed.). Szczecin. Wydawnictwo Naukowe Uniwersytetu Szczecińskiego: 156-157.
- Czyżewski, A., Kułyk, P. (2013). Kwestia rolna w teorii wyboru publicznego. *Roczniki Naukowe Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*. No. 100(3): 7-18.
- Czyżewski, A., Matuszczak, A. (2005). Interesy rolnictwa w świetle globalnych uwarunkowań polityki gospodarczej. [in:] *Polityka Gospodarcza*. No. 12: 12.
- Czyżewski, A., Matuszczak, A. (eds.) (2012). *Ekonomia i jej społeczne otoczenie*. Wydawnictwo Kujawsko-Pomorskiej Szkoły Wyższej w Bydgoszczy. Bydgoszcz: 9-14.
- Czyżewski, A., Stępień, S. (2011). Wspólna polityka rolna UE po 2013 r. a interesy polskiego rolnictwa. *Ekonomista*. No. 1: 9-36.
- Czyżewski, A., Stępień, S. (2014). Elementy nowości wspólnej polityki rolnej po 2014 roku w odniesieniu do polskiego rolnictwa. *Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego (SGGW) w Warszawie: Problemy Rolnictwa Światowego*. Nr 14(3): 37-47.
- Czyżewski, B. (2005). Koszty transakcyjne w agrobiznesie w Polsce po roku 1990. [in:] *Prace Naukowe AE we Wrocławiu. Agrobiznes*. Vol. I. No. 1070: 349-361.

- Czyżewski, B. (2009a). Rynkowa wartość renty gruntowej a proces jej realizacji w gospodarstwach rolnych w Polsce. *Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu AR w Poznaniu (Roczniki Naukowe SERiA)*. Tom XI. Zeszyt 2: 37-42.
- Czyżewski, B. (2009b). Instytucjonalne uwarunkowania zrównoważonego podziału dochodów w rolnictwie indywidualnym w Polsce. [in:] J.S. Zegar (ed.). *Z badań nad rolnictwem społecznie zrównoważonym. Program Wieloletni 2004-2009. Raport 174*. IERiGŻ. Warsaw.
- Czyżewski, B. (2009c) Zależności między strukturą instytucjonalną a procesem alokacji zasobów w wybranych typach produkcyjnych gospodarstw rolnych w Polsce. [in:] D. Kołodziejczyk (red). *Zrównoważenie indywidualnych gospodarstw rolnych. Raport IERiGŻ-PIB. Program Wieloletni 2005-2009*. IERiGŻ. Warsaw.
- Czyżewski, B. (2010). Kontrowersje wokół rent gruntowych: od ekonomii klasycznej do czasów współczesnych. [in:] *Ekonomista*. No. 2: 227-242.
- Czyżewski, B. (2013). Renty ekonomiczne w gospodarce żywnościowej w Polsce. *Polskie Wydawnictwo Ekonomiczne*. Warsaw: 13.
- Czyżewski, B. (2016). Renty polityczne w nowym paradygmacie rolnictwa – rozważania na przykładzie gospodarstwa reprezentatywnego FADN w Polsce. *Roczniki Naukowe SERiA*. Vol. XVII/6: 50-59.
- Czyżewski, B., Brelik, A. (2013) Public goods and intrinsic land productivity – deliberations in the context of the paradigm of sustainable agriculture. *Acta Scientiarum Polonorum. Seria: Oeconomia*. Vol. 12 (4): 31-40.
- Czyżewski, B., Brelik, A., (2014). Czy subsydia ze wspólnej polityki rolnej UE są rentą polityczną? Próba konceptualizacji badań. *Journal of Agribusiness and Rural Development*. No. 1(31): 13-20.
- Czyżewski, B., Majchrzak, A. (2014). Regulation for the polish agricultural land market compared with the other EU members states: implication for market efficiency. *Economic Studies*. Institute of Economics of the Polish Academy of Sciences, No. 2.
- Czyżewski, B., Majchrzak, A. (2016). Market versus agriculture in Poland – macroeconomic relations of incomes, prices and productivity in terms of the sustainable development paradigm. *Technological and Economic Development of Economy*, in press.
- Czyżewski, B., Matuszczak A. (2016). A new land rent theory for sustainable agriculture. *Land Use Policy*. Vol. 55: 222-229. <http://dx.doi.org/10.1016/j.landusepol.2016.04.002>.
- Czyżewski, B., Matuszczak A. (2017). Interwencjonizm rolny: pogoń za rentą, wybór publiczny, czy korygowanie rynku? *Ekonomista*, No 1, in press.
- Czyżewski, B., Mrówczyńska-Kamińska, A. (2011). Przepływy międzygałęziowe i podział rent w sektorze rolno-żywnościowym w Polsce w latach 1995-2005. *Ekonomista*. No. 2.
- Czyżewski, B., Smędzik- Ambroży, K. (2016). The regional structure of CAP subsidies and factor productivity in agriculture in the EU28 – a spatial analysis. *Agricultural Economics*. Czech Academy Of Agricultural Sciences, in press.
- Czyżewski, B., Trojanek, R. (2016). Czynniki wartości ziemi rolnej w kontekście zróżnicowanych funkcji obszarów wiejskich w Polsce. *Zagadnienia Ekonomiki Rolnej*. Vol. 2(347): 3-25. doi:10.5604/00441600.1203336.
- Daly, H. (2007). *Ecological Economics and Sustainable Development. Selected Essays of Herman Daly*. Edward Elgar. Cheltenham. Northampton.
- Davies, J. H, Goldberg, R. A. (1967). *A Concept od agribusiness*. Boston 1957. tłumaczenie polskie: *Koncepcja agrobiznesu*. KIER. Warsaw.
- de Gorter, H., Swinnen, J.F.M. (2002) Political economy of agricultural policies. [in:] Gardner, G., Rausser, G. (eds.). *The Handbook of Agricultural Economics*. Elsevier. Amsterdam, Vol. 2.
- De la Fuente, E.B., Suárez, S.A., Ghersa, C.M. (2006). Soybean weed community composition and richness between 1995 and 2003 in the Rolling Pampas (Argentina). *Agriculture, Ecosystems & Environment*. Vol. 115: 229-236.

- Deininger, K. (2003). Causes and Consequences of Civil Strife: Micro-Level Evidence from Uganda. The World Bank.
- Delbecq, B.A., Kuethe, T.H., Borchers, A.M. (2014). Identifying the Extent of the Urban Fringe and Its Impact on Agricultural Land Values. *Land Economics*. Vol. 90. No. 4: 587-600.
- DG Research (2007). FP7 COOPERATION Theme 2: Food, Agriculture, Fisheries and Biotechnology. Work programme 2007-2008: 69. http://ec.europa.eu/research/participants/data/ref/fp7/88207/b_wp_200702_en.pdf (20.02.2016)
- Dobija, D. (ed.) (2003). Pomiar i rozwój kapitału ludzkiego przedsiębiorstwa: materiały konferencyjne. Polska Fundacja Promocji Kadr. Warsaw: 89, 105.
- Dube, O., Vargas, J. (2013). Commodity Price Shocks and Civil Conflict: Evidence from Columbia. *The Review of Economic Studies*. Vol. 80. No. 4.
- Duer, I. (2012). Dobra publiczne użytkowane i dostarczane przez rolnictwo – wspierane w ramach programu rozwoju obszarów wiejskich. [in:] *Możliwości rozwoju obszarów problemowych rolnictwa (OPR) w świetle PROW 2007-2013*, 2012(21): 85.
- Dzinkowski, R. (1999). Buried Treasure, *World Accounting Report Financial Times*. Revealed Treasure. *World Accounting Report Financial Times*, Issue 2:5, June.
- Elsenhans, H. (1997). *State, class, and Development*. Sangam Books. London.
- Enriquez, J. (1998). Genomics and the World's Economy. *Science* 281(5379): 925-926. ProQuest, <http://search.proquest.com/proquest.han.bg.sggw.pl/docview/213561444/fulltextPDF/54713A07608F4C1FPQ/1?accountid=48272> (15.02.2016).
- Esteban, J., Ray D. (1999). Conflict and distribution. *Journal of Economic Theory*. Vol. 87.
- Estes, R. (1993). Toward sustainable development: from theory to praxis. [in:] *Social Development Issues*. ICSD. Vol. 15. No. 3: 1-29.
- European Commission (2005a). Sustainable Development Indicators to Monitor the Implementation of the EU Sustainable Development Strategy. Brussels. Commission of the European Communities.
- European Commission (2005b). New perspectives on the knowledge-based bio-economy. Conference report of The knowledge-based bio-economy conference in Brussels, Brussels, Belgium, European Commission's Research DG with the support of the Interpretation DG, Conference Directorate and the UK Presidency of the EU: 24. https://ec.europa.eu/research/conferences/2005/kbb/pdf/kbbe_conferencereport.pdf (28.02.2016).
- European Commission (2009). Sustainable Development Indicators, Overview of relevant FP-funded research and identification of further needs. Brussels.
- European Commission Communication (2010a)., *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth*, Brussels: 11-12.
- European Commission (2010b). Roadmap: European Strategy and Action plan towards a sustainable bio-based economy by 2020. Brussels, Belgium: 6. http://ec.europa.eu/smart-regulation/impact/planned_ia/docs/2010_rtd_055_sustainable_bio_economy_en.pdf (2.03.2016).
- European Commission (2011a). Bio-based economy for Europe: state of play and future potential – Part 2. Report on the European Commission's Public on-line consultation. Luxembourg, EC Directorate-General for Research and Innovation, Food, Agriculture & Fisheries, Biotechnology, Brussels, Belgium: 30. <https://ec.europa.eu/research/consultations/bioeconomy/bio-based-economy-for-europe-part2.pdf> (1.03.2016).
- European Commission (2011b). Communication from the Commission to the European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions A resource-efficient Europe – Flagship initiative under the Europe 2020 Strategy, Brussels, Belgium: 17. http://ec.europa.eu/resource-efficient-europe/pdf/resource_efficient_europe_en.pdf (1.03.2016).

- European Commission (2011c). The CAP in perspective: from market intervention to policy innovation. Agricultural Policy Perspectives Briefs. Agriculture and Rural Development. Brief No 1. Rev. January: 2.
- European Commission (2012a). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Innovating for Sustainable Growth: A Bioeconomy for Europe, Brussels, Belgium: 9. http://ec.europa.eu/research/bioeconomy/pdf/201202_innovating_sustainable_growth_en.pdf (28.02.2016).
- European Commission (2012b). Commission Staff Working Document accompanying the document Innovating for Sustainable Growth: A Bioeconomy for Europe; European Commission: Brussels, Belgium: 51. http://ec.europa.eu/research/bioeconomy/pdf/201202_commission_staff_working.pdf (28.02.2016).
- European Commission (2013). Overview of CAP Reform 2014-2020. Agricultural Policy Perspectives Briefs. No 5/December.
- European Commission official website, <http://ec.europa.eu/> (16.11.2015).
- European Commission official website, http://ec.europa.eu/agriculture/cap-history/index_en.htm (5.05.2016).
- European Network for Rural Development (2010). Tematyczna grupa robocza 3. Dobra publiczne i publiczny system Interwencji. Raport analityczny Paneuropejski przegląd podejścia państw członkowskich do dostarczania środowiskowych i społecznych dóbr publicznych w programach rozwoju obszarów wiejskich na lata 2007-2013 (report from stage 3).
- Ezekiel, M. (1938). The Cobweb Theorem. *The Quarterly Journal of Economics*. Vol. 52. No. 2: 255.
- Falkowski, J., Kostrowicki, J. (2005). *Geografia rolnictwa świata*. Wydawnictwo Naukowe PWN. p. 415-418, 425-426.
- Fałkowski, J. (2010). Wielofunkcyjność rolnictwa jako przedmiot analizy ekonomicznej. [in:] J. Wilkin (ed.). *Wielofunkcyjność rolnictwa. Kierunki badań, podstawy metodologiczne i implikacje praktyczne*. Instytut Rozwoju Wsi i Rolnictwa Polskiej Akademii Nauk. Warsaw: 53-58.
- FAO (2015) <http://www.fao.org/family-farming/en/>.
- FAPA (2009). *Koncepcja dóbr publicznych w dyskusji o przyszłości Wspólnej Polityki Rolnej*. preliminary version. Warsaw. December 2009.
- Faucheux, S., O'Connor, M., Van der Straaten, J., (eds.) (1998). *Sustainable Development: Concepts, Rationalities and Strategies*. Kluwer Academic Publishers: 326.
- Faux, J., Perry, G.M. (1999). Estimating irrigation water value using hedonic price analysis: a case study in Malheur County. Oregon. *Land Econ.* 75: 440-452. <http://dx.doi.org/10.2307/3147189>.
- Featherstone, A., Baker, T. (1987). An Examination of Farm Sector Real Asset Dynamics: 1910-85. *American Journal of Agricultural Economics*. Vol. 69. No. 3: 532-546.
- Ferrini, S., Scarpa, R. (2007). Designs with A Priori Information for Nonmarket Valuation with Choice Experiments: A Monte Carlo Study. *Journal of Environmental Economics and Management*, 53(3): 342-63.
- Fiedor, B., Jończy, R. (2009). Globalne problemy interpretacji i wdrażania koncepcji sustainable development. [in:] B. Fiedor, R. Jończy (eds.). *Rozwój zrównoważony, teoria i praktyka*. Wyd. Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław: 41.
- Fiedor, B., Kociszewski, K. (eds.) (2010). *Ekonomia rozwoju*. Wyd. UE we Wrocławiu. Wrocław.
- Fijałkowska, J. (2012). Analiza porównawcza wybranych metod pomiaru i wyceny kapitału intelektualnego. *Zarządzanie i Finanse, Journal of Management and Finance*, vol. 10, no. 1, part 3: 419, 421, 423.

- Fijor, J.M. (2011). Czy dobra publiczne są naprawdę publiczne? *Studia Ekonomiczne. Economic Studies* 2011(1) (LXVIII). MISCELLANEA: 87-100.
- Firlej, K. (2008). Zarządzanie wiedzą warunkiem rozwoju przedsiębiorstw przemysłu spożywczego. [in:] *Zarządzanie organizacjami w gospodarce opartej na wiedzy. Zasobowe podstawy funkcjonowania i rozwoju organizacji*. A. Gliška-Neweś (ed.). Uniwersytet Mikołaja Kopernika w Toruniu – Towarzystwo Naukowe Organizacji i Kierownictwa Oddział Toruń. Toruń.
- Firlej, K. (2011). Aspekty good governance przedsiębiorstw z indeksu WIG-Spożywczy. [in:] *Ekonomika i organizacja gospodarki żywnościowej. Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie*. Wydawnictwo SGGW. Warsaw. No. 87: 27-41.
- Firlej, K., Rydz, A. (2012). System doradztwa rolniczego w Polsce oraz jego wykorzystanie w ramach działania 114 PROW 2007-2013. *Roczniki Ekonomiczne Kujawsko-Pomorskiej Szkoły Wyższej w Bydgoszczy, Wydawnictwo Kujawsko-Pomorskiej Szkoły Wyższej w Bydgoszczy*. Vol. 5: 199-222.
- Firlej, K., Żmija, D. (2014). Transfer wiedzy i dyfuzja innowacji jako źródło konkurencyjności przedsiębiorstw przemysłu spożywczego w Polsce. *Fundacja Uniwersytetu Ekonomicznego w Krakowie*. Kraków: 72-73.
- Fischer, P. (2006). *Rent-seeking, institutions and reforms in Africa: theory and empirical evidence for Tanzania*. Springer. New York.
- Flanders, A., White, F.C., Escalante, C.L. (2004). Equilibrium of Land Values from Agricultural and General Economic Factors for Cropland and Pasture Capitalization in Georgia. *Journal of Agribusiness*. Vol. 22. No. 1: 49-60.
- Floriańczyk, Z., Mańko, S., Osuch, D., Płonka, R. (2013). Wyniki Standardowe 2012 uzyskane przez gospodarstwa rolne uczestniczące w Polskim FADN. Część I, Wydawnictwo Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej PiB. Warsaw: 36.
- Frączek, P. (2012). Uwarunkowania pomiaru kapitału intelektualnego. *Nierówności Społeczne a Wzrost Gospodarczy. Zeszyty Naukowe Uniwersytetu Rzeszowskiego*, no. 27, Rzeszów: 20.
- Freibauer, A., Mathijs, E., Brunori, G., Damianova, Z., Faroult, E., Girona, Gomis, J., O'Brien, L., Treyer, S. (2011). The 3rd SCAR Foresight Exercise. Sustainable Food Consumption and Production in a Resource-Constrained World. EU Standing Committee on Agricultural Research (SCAR), Brussels: 150.
- Frydman, R., Goldberg, M.D. (2009). *Ekonomia wiedzy niedoskonałej*. Wydawnictwo Krytyki Politycznej. Warsaw: 4, 5, 9.
- Furtan, H., Sauer J., Jensen M. (2009). Free-riding on rent seeking – an empirical analysis. *Public Choice*. No. 140: 479-500.
- Galbraith, J.K. (2011). *Ekonomia w perspektywie*. PTE. Warsaw: 63.
- Gardner, B. (1987). Causes of U.S. Farm Commodity Programs. *Journal of Political Economy*. No. 95(2): 290-313.
- Garner, E., Gender, P. (2013). Identifying the Family Farm: an informal discussion on the concepts and definitions. ESW Seminar, Equity and Rural Employment. Rome: FAO. http://www.nsm.bg/sites/default/files/Family_Farming_Definition_ESWSeminar.pdf. (5.02.2016)
- Gavier-Pizarro, G.I., Calamari, N.C., Thompson, J.J., Canavelli, S.B., Solari, L.M., Decarre, J., Goijman, A.P., Suarez, R.P., Bernardos, J.N., Zaccagnini, M.E. (2012). Expansion and intensification of row crop agriculture in the Pampas and Espinal of Argentina can reduce ecosystem service provision by changing avian density. *Agriculture, Ecosystems & Environment*. Vol. 154: 44-55. <http://dx.doi.org/10.1016/j.agee.2011.08.013>.
- Gay, S.H., Osterburg, B., Baldock, D., Zdanowicz, A. (2005). Recent evolution of the EU Common Agricultural Policy (CAP): state of play and environmental potential. Specific targeted research project n°SSPE-CT-2004-503604 Impact of Environmental Agreements on

- the CAP. Document number: MEACAP WP6 D4b, March. http://www.ieep.eu/assets/224/WP6D4B_CAP.pdf. (1.03.2016).
- Giannakis, E., Bruggeman, A. (2015). The highly variable economic performance of European agriculture. *Land Use Policy* 45.
- Gimer, C., Kimura, S. (2010). Relative Importance of Different Sources of Risks and their Interactions. *Risk Management in Agriculture: Towards Effective Policies* (conference). Paris. November.
- Gliessman, S.R., Rosemeyer, M. (eds.) (2010). *The Conversion to Sustainable Agriculture Principles, Processes and Practices*. CRL Press. Boca Raton. London – New York.
- Goemans, H. E. (2000) *War and Punishment: The Causes of War Termination and the First World War*. Princeton University Press.
- Gomułowicz, A., Małecki, J. (2000). *Podatki i prawo*. 4th edn. ASS Boni et Aequi. Poznań: 60.
- Goraj, L. (2009). Wpływ Wspólnej Polityki Rolnej na dochody polskich gospodarstw rolnych. proceedings of the conference: “Polska wizja Wspólnej Polityki Rolnej po 2013 r.”. Warsaw 26 January 2009, SGGW.
- Goraj, L., Naneman, J., Zagórski, M. (2014). Uwarunkowania i konsekwencje opodatkowania rolnictwa w Polsce. *Forum Inicjatyw Rozwojowych*. Warsaw: 20-28.
- Gray, A. (1948). *The Development of Economic Doctrine*. Longmans-Green. London: 106.
- Gregory, P.J., Ingram, J.S.I., Brklacich, M. (2005). Climate change and food security. *Phil. Trans. R. Soc. B*. 360(1463). 2139-2148.
- Grosskurth, J., Rotmans, J. (2005). The scene model: getting a grip on sustainable development in policy making. *Environment. Development and Sustainability*. No. 7(1): 135-151.
- Grzelak, A. (2006). Wykorzystanie analizy skupień w badaniach struktur agrobiznesu na przykładzie powiązań gospodarstw rolnych z rynkiem. *Zeszyty Naukowe Akademii Rolniczej we Wrocławiu. Rolnictwo LXXXVII*. No. 540: 179-185.
- Grzelak, A. (2016). The economic situation of agricultural holdings in the European Union after 2004. *Proceedings – Hradec Economic Days*. University of Hradec Kralove: 219-225.
- Hanley, N., Kriström, B., Shogren, J.F. (2009). Coherent Arbitrariness: On Value Uncertainty for Environmental Goods. *Land Economics*, 85(1): 41-50.
- Harberger, A.C. (1954). Monopoly and Resource Allocation. [in:] *The American Economic Review*. No. 44: 77-87.
- Hayami, Y., Ruttan, V. (1985). *Agricultural Development: An International Perspective*. Johns Hopkins University Press. Baltimore and London.
- Head, J.G. (1962). Public Goods and Public Policy. *Public Finance*. No. 17.
- Heilbroner, R.L., Thurow, L.C. (1981). *The Economic Problem*. Prentice Hall. Enlowood Cliffs: 314ff.
- Heller, H. (2005). *Die Steuern*. 3rd edn. Tubingen, 1981: 42. (in:) H. Litwinińczuk. *Prawo podatkowe przedsiębiorców*. 3rd edn. KiK Konieczny i Kruszewski. Warsaw 2005: 77.
- Herrera-Ulloa, A., Charles, A., Lluch-Cota, S., Ramirez-Aguirre, H., Hernandez-Vazquez, S., Ortega-Rubio, A. (2003). A regional-scale sustainable development index: the case of Baja California Sur. Mexico. *International Journal of Sustainable Development and World Ecology*. No. 10(4): 353-360.
- Hillman, A. (2003). *Public Finance and Public Policy: Responsibilities and Limitations of Government*. Cambridge University Press, Cambridge.
- Hindmoor, A. (1999). Rent Seeking Evaluated. *The Journal of Political Philosophy*. No. 4(7): 434-452.
- Hnatyszyn-Dzikowska, A., Polcyn, J. (2015). Regionalne zróżnicowanie dostarczania usług publicznych-wybrane aspekty metodologiczne. In: Polcyn, J., Głowski, P.(ed.), *Rozwój regionalny i jego determinanty*. Tom II, Wydawnictwo Państwowej Wyższej Szkoły Zawodowej im. Stanisława Staszica w Pile: 249-267.

- Hofman, M. (2011). Controlling kapitału intelektualnego – koncepcja rozwiązania, *Nierówności Społeczne a Wzrost Gospodarczy*. Społeczeństwo informacyjne – regionalne aspekty rozwoju, *Zeszyty Naukowe Uniwersytetu Rzeszowskiego*, no. 23, Rzeszów: 85.
- Holzer, J., Lipton, D., François, O. (2012). Rent-Seeking And Incentives For Compliance In The Commons. *American Journal of Agricultural Economics*. Vol. 95(1)/10.
http://calcoolator.pl/rysowanie_wykresow_funkcji.html (8.07.2016).
- <http://ec.europa.eu/eurostat/data/database/> Unit values at producer prices [aact_uv02] (20.10.2014).
- <http://www.imcagro.com.ua/> (9.12.2015).
- <http://www.kernel.ua/> (9.12.2015).
- <http://www.oecd.org/tad/support/pseese> (20.10.2014).
- Hvid, A.K. (2015). Increasing Natural Resource Rents from Farmland: A Curse or a Blessing for the Rural Poor?. *Peace Econ. Peace Sci. Pub. Pol.* Vol. 21(1).
- Iazzolino, G., Laise, D. (2013). Value added intellectual coefficient (VAIC): A methodological and critical review. *Journal of Intellectual Capital*. Vol. 14. Issue 4: 559.
- INSURE (2007). Guidelines to Develop a S-Indicator. Work Package 4. Maastricht. International Centre for Integrated assessment and Sustainable development. Maastricht University.
<http://www.icis.unimaas.nl/downloads/insure/GUIDELINES/INSURE%20indicator%20guideline%20final%20feb%2007.pdf>. (1.03.2016).
- Jakubowski, M. (2012). Dobra publiczne i dobra wspólne. [in:] J. Wilkin (ed.), *Teoria wyboru publicznego. Główne nurty i zastosowania*. Warsaw: 42-65.
- Jarugowa, A., Fijałkowska, J. (2002). Rachunkowość i zarządzanie kapitałem intelektualnym – koncepcja i praktyka, *Ośrodek Doradztwa i Doskonalenia Kadr Sp. z o. o.*, Gdańsk: 128-129, 131.
- Jeżowski, P. (2009). Kapitał naturalny i rozwój zrównoważony a sprawiedliwość. [in:] B. Fiedor, R. Jończy (eds.). *Rozwój zrównoważony, teoria i praktyka*. Wyd. Uniwersytetu Ekonomicznego we Wrocławiu. Wrocław: 72.
- Jonsson, T. (2007). Collective action and Common Agricultural Policy lobbying: Evidence of Euro-Group influence, 1986-2003. *Umeå Economic Studies*. No. 713. Umeå University.
- Josling, T. (2008a). Distortions to Agricultural Incentives in Western Europe. *Agricultural Distortions Working Paper 61*. September. Freeman Spogli Institute for International Studies. Stanford University.
- Josling, T. (2008b). External influences on CAP reforms: an historical perspective. [in:] Swinnen J. F. M. (ed.). *The perfect storm. The political economy of the Fischler reforms of the Common Agricultural Policy*. Center for European Policy Studies. Brussels.
- Josling, T. (2009). Western Europe. [in:] Anderson, K. (2009). *Distortions to Agricultural Incentives: A Global Perspective. 1955-2007*. London. Palgrave Macmillan. Washington. DC. World Bank: 115-176.
- Kamerschen, D., McKenzie, R.B., Nardinelli, C. (1992). *Ekonomia*. PWN. Gdańsk.
- Kaminski, J., Kan, I., Fleischer, A. (2012). A Structural Land-Use Analysis Of Agricultural Adaptation To Climate Change: A Proactive Approach. *American Journal of Agricultural Economics*. Vol. 95. No. 1: 70-93. Doi: 10.1093/Ajae/Aas075 Published online 18 October 2012.
- Kania, J., Drygas, M., Kutkowska, B., Kalinowski, J. (2011). System transferu wiedzy dla sektora rolno-spożywczego – oczekiwane kierunki rozwoju. *Polish Journal of Agronomy*. No. 7: 22-28.
- Kasiewicz, S., Rogowski, W., Kicińska, M. (2006). Kapitał intelektualny. Spojrzenie z perspektywy interesariuszy. *Oficyna Ekonomiczna*, Kraków: 199-200, 202-203, 204, 214-215.
- Katz, E., Rosenberg, J. (1989). Rent-Seeking for budgetary allocation: Preliminary results for 20 countries. *Public Choice*. No. 60: 133-144.

- Kelly, R., Moles, R. (2002). The development of Local Agenda 21 in the mid-west region of Ireland: a case study in interactive research and indicator development. *Journal of Environmental Planning and Management*. No. 45(6): 889-912.
- Keynes, J. M. (2003). *Ogólna teoria zatrudnienia, procentu i pieniądza*. PWN. Warsaw: 171.
- Khwaja, A. (2004). Is increasing community participation always a good thing? *Journal of the European Economic Association*. No. 2.
- Klimowicz, M., Bokajło, W. (2012). *Kapitał społeczny – interpretacje, impresje, operacjonalizacja*. CeDeWu. Warsaw: 98-112.
- Kolmar, M., Rommeswinkel, H. (2013). Contests with group specific public goods and complementarities in efforts. *Journal of Economic Behavior and Organization*. No. 89: 9-22.
- Kopeć, B. (1984). Intensywność organizacji w rolnictwie polskim w latach 1960-1980. *Roczniki Nauk Rolniczych. Seria G*. No. 84(1): 7-27.
- Kośmicki, E. (2009a). *Główne zagadnienia ekologizacji społeczeństwa i gospodarki*. EkoPress. Białystok.
- Kośmicki, E. (2009b). Podstawowe problemy ekologizacji rolnictwa. Próba eksplikacji głównych zagadnień. [in:] *Rozwój zrównoważony, teoria i praktyka ze szczególnym uwzględnieniem obszarów wiejskich*. Fiedor, B., Jończy, R. (eds.). Wyd. UE we Wrocławiu. 121-138.
- Kowalski, A., Rembisz, W. (2005). *Rynek rolny i interwencjonizm a efektywność i sprawiedliwość społeczna*. IERiGŻ. Warsaw.
- Kozera, M. (2011). *Kapitał ludzki jako składnik kapitału intelektualnego w rolnictwie*. Zeszyty Naukowe SGGW, seria Problemy rolnictwa światowego. Vol. 11 (XXVI): 105-111.
- Kozuń-Cieślak, G. (2013). Efektywność – rozważania nad istotą i typologią. *Kwartalnik Kolegium Ekonomiczno-Społecznego SGH "Studia i Prace"*. Vol. 4(16). p.26.
- Krueger, A. (1974). The Political Economy of the Rent-Seeking Society. *The American Economic Review*. No. 64(3): 291-303.
- Kułyk, P. (2013) *Finansowe wsparcie rolnictwa w krajach o różnym poziomie rozwoju gospodarczego*. Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu. Poznań.
- Kułyk, P. (2015). Kierunki zmian w finansowym wsparciu rolnictwa w świetle doświadczeń kryzysu finansowego. [in:] *Problemy rozwoju rolnictwa i gospodarki żywnościowej w pierwszej dekadzie członkostwa Polski w Unii Europejskiej*. IX Kongres Ekonomistów Polskich, Warsaw. Polskie Towarzystwo Ekonomiczne.
- Kuś, D. (2012). Egzogeniczne i endogeniczne uwarunkowania procesu modernizacji rolnictwa. *Roczniki Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*. Vol. 99(2):59.
- Kutkowska, B., Berbeka, T. (2012). The Common Agricultural Policy to face the challenges of agriculture in Lower Silesia. *Zeszyty Naukowe SGGW. Polityki europejskie, finanse i marketing*. Warsaw. No. 8(57):266-267.
- Lamb, R. (2006). Rent Seeking in U.S.-Mexican Avocado Trade. *Cato Journal*. No. 26(1): 159-177.
- Lancaster, K. J. (1966). A New Approach to Consumer Theory. *The Journal of Political Economy*. Vol. 74: 132-157.
- Laskowski, W. (2001). Sytuacja dochodowa ludności wiejskiej w 1999 roku w kontekście rozwoju przedsiębiorczości. [in:] *Rozwój przedsiębiorczości wiejskiej w perspektywie integracji z Unią Europejską*. Gutkowska, K., Ozimek I. (ed.), Wydawnictwo SGGW, Warsaw.
- Lawn, P. (2006). *Sustainable development indicators in ecological economics*. Edward Elgar, Cheltenham: 467.
- Leguizamón, A. (2013). Modifying Argentina: GM soy and socio-environmental change. *Geoforum*. Vol. 53: 149-160, <http://dx.doi.org/10.1016/j.geoforum> (1.04.2013).
- Leopold, A. (2002). *Wybór prac w sprawie wsi i rolnictwa w okresie przemian*. SGGW. Warsaw: 78.

- Lerman, Z., Schreinemachers, P. (2005). Individual farming as a labor sink: evidence from Poland and Russia. *Comparative Economic Studies*. Vol. 47. No. 4: 675-695.
- Levidow, L., Birch, K., Papaioannou, T. (2012). EU agri-innovation policy: two contending visions of the bio-economy. *Critical Policy Studies*. Vol. 6. No. 1: 40-65. http://www.hks.harvard.edu/sdn/articles/files/Levidow_LLKBTP_EU%20agri-innovation%20policy_CPS%2012.pdf (1.03.2016).
- Lewandowski, J. (1960). Renta gruntowa w rolnictwie polskim, Polskie Wydawnictwa Gospodarcze, Warsaw.
- Lopez, R.A., Hathie, I. (2000). The structure of government intervention in African agriculture. *The Journal of Development Studies*. Vol. 37. No. 1: 59.
- Ma, S., Swinton, S.M. (2012). Hedonic valuation of farmland using sale prices versus appraised values. *Land Econ.* No. 88: 1-15.
- Maciejczak, M. (2009). Rolnictwo i obszary wiejskie źródłem dóbr publicznych – przegląd literatury. *Zeszyty Naukowe SGGW. Ekonomia i Organizacja Gospodarki Żywnościowej*. no. 75. SGGW. Warsaw.
- Maciejczak, M., Hofreiter, K. (2013). How to define bioeconomy? *Roczniki Naukowe SERIA. Tom XV. Zeszyt 4*: 243-248.
- Maddison, D. (2000). A hedonic analysis of agricultural land prices in England and Wales. *Eur. Rev. Agric. Econ.* Vol. 27: 519-532. <http://dx.doi.org/10.1093/erae/27.4.519>.
- Majchrzak, A. (2015). Ziemia rolnicza w krajach Unii Europejskiej w warunkach ewolucji wspólnej polityki rolnej. Wydawnictwo Naukowe PWN. Warsaw: 15-20.
- Majewski, E. (2008). Trwały rozwój i trwałe rolnictwo. Teoria a praktyka gospodarstw rolniczych. Wyd. SGGW. Warsaw: 199.
- Majewski, E., Dalton, G. (2003). Farming on the edge in Poland. Options for improving farm incomes for the main types of farms after joining the EU, international farm management congress 2003, farming at the edge, <http://ageconsearch.umn.edu/bitstream/24307/1/cp03ma01.pdf> (15.12.2015).
- Malkina-Pykh, I.G., Pykh, Y.A. (2003). *Sustainable Food and Agriculture*. WIT Press. Southampton. Boston.
- Malpezzi, S. (2003). Hedonic Pricing Models: A Selective and Applied Review. [in:] *Housing Economics and Public Policy: Essays in honor of Duncan MacLennan*. O'Sullivan T., Gibb K. (eds.). Oxford: Blackwell.
- Małazewska, S. (2015). Środowiskowe dobra publiczne w rolnictwie i na obszarach wiejskich. *Ekonomia i Środowisko*, 1(52): 132-147.
- Manteuffel, R. (1987). *Filozofia rolnictwa*. Logos. PWN. Warsaw: 264.
- Matthews, A. (2011). Production effects of moving to flatter structure of direct payments. September 30. <http://capreform.eu/production-effects-of-moving-to-flatter-structure-of-direct-payments>. (1.03.2016)
- Matuszczak, A. (2007). Dualny rozwój rolnictwa i obszarów wiejskich. w: Andrzej Czyżewski (red.). *Uniwersalia polityki rolnej w gospodarce rynkowej: ujęcie makro- i mikroekonomiczne*. Wydawnictwo Akademii Ekonomicznej w Poznaniu: 99-120.
- Matuszczak, A. (2009). Instytucjonalne uwarunkowania zrównoważonego podziału dochodów w rolnictwie indywidualnym w Polsce. [in:] J.S. Zegar (ed.) *Z badań nad rolnictwem społecznie zrównoważonym* (9). IERiGŻ-PIB. Warsaw: 49.
- Matuszczak, A. (2013). Zrównoważenie rozwoju rolnictwa w regionach Unii Europejskiej w aspekcie jego zróżnicowania. *Wydawnictwo Naukowe PWN*. Warsaw: 56-65, 363.
- McCorrison, S., Sheldon, I.M. (1991). Government Intervention in Imperfectly Competitive Agricultural Input Markets. *American Journal of Agricultural Economics*. No.73.
- McManus, P. (2008). Mines, wines and thoroughbreds: towards regional sustainability in the Upper Hunter. *Australia Regional Studies*. No. 42(9): 1275-1290.

- Mendoza, E., Tesar, L. (2005). Why hasn't tax competition triggered a race to the bottom? Some quantitative lessons from the EU. *Journal of Monetary Economics*.
- Michna, W. (2008). Raport o wpływie Wspólnej Polityki Rolnej na tendencje polaryzacji gospodarstw rolnych w ramach poszczególnych makroregionów kraju, Program Wieloletni. Wyd. IERiGŻ-PIB. Vol. 1(93). p.26.
- Mieszczankowski, M. (1964). *Teoria renty absolutnej*. PWN. Warsaw.
- Miranowski, J., Hammes, B. (1984). *Implicit Prices of Soil Characteristics for Farmland in Iowa*. Iowa State University. Department of Economics.
- Morozova, O.V. (2009). *Koncepcja Zrównoważonego Rozwoju w Teorii Ekonomii*. [in:] B. Poskrobko (ed.). *Wpływ idei zrównoważonego rozwoju na politykę państwa i regionów*, tom 1. *Problemy ogólnopaństwowe i sektorowe*. Wydawnictwo Wyższej Szkoły Ekonomicznej w Białymstoku. Białystok: 133.
- msp.Money.pl, 16.12.2015: 165-204.
- Mueller, D. (2015). Profit seeking and rent seeking in the United States and Europe. (in:) *Companion to the Political Economy of Rent Seeking*. (eds.) R. Congleton, A. Hillman. Elgar. Cheltenham. Northampton.
- Murphy, K., Shleifer, A., Vishny, R.W. (1993). Why Is Rent-Seeking So Costly to Growth? *American Economic Review*. No. 83: 409-414.
- Musiał, W. (2009). Wielki kryzys ekonomiczny w rolnictwie polskim – przypomnienie i przestroga. *Journal of Agribusiness and Rural Development*. No. 3: 152-162.
- Musgrave, R.A., Musgrave, P.B. (1980). *Public Finance in Theory and Practice*. McGraw-Hill Book Company. New York: 337-346.
- Myers, R.J., Sexton, R.J., Tomek, W.G. (2010). A Century of Research on Agricultural Markets. *American Journal of Agricultural Economics*. Vol. 92: 377-378.
- Nedergaard, P. (2006). Market failures and government failures: a theoretical model of common agricultural policy. *Public Choice*. No. 127: 393-413.
- Nickerson, C., Morehart, M., Kuethe, T., Beckman, J., Ifft, J., Williams, R. (2012). Trends in U.S. Farmland Values and Ownership. *Economic Information Bulletin*. No. 92.
- Niewęłowska, G. (2011). Koszty spełnienia wymogów wzajemnej zgodności w polskich gospodarstwach rolnych. *IERGŻ – PIB*. No. 24. Warsaw.
- Niklewicz, M. (2011). *Od koncepcji gospodarki opartej na wiedzy do nowej strategii rozwoju UE 2020*, Wrocław University: 445.
- Nilsson P., Johansson S. (2013). Location determinants of agricultural land prices. *Jahrb Reg wiss* No. 33:1–21.
- Nita, B. (2007). *Metody wyceny i kształtowania wartości przedsiębiorstwa*. Polskie Wydawnictwo Ekonomiczne. Warsaw: 110, 112.
- Nita, B. (2013). Wycena kapitału intelektualnego w raportach menedżerskich. *Finanse, rynki finansowe, ubezpieczenia*. Zeszyty Naukowe Uniwersytetu Szczecińskiego. No. 761: 643, 645, 646.
- Nitzan, S., Ueda, K. (2009). Collective contests for commons and club goods. *Journal of Public Economics*. No. 93: 48-55.
- Nivens, H.D., Kastens, T.L., Dhuyvetter, K.C., Featherstone, A.M. (2002). Using satellite imagery in predicting Kansas farmland values. *J. Agric. Resour. Econ*: 464-480.
- North, D. (1986). *The New Institutional Economics*. [in:] *Journal of Institutional and Theoretical Economics*. Berlin: 142, 230.
- O'Dea, C. (2013). Lawmakers look to restrict farmland tax break to working farmers. *NJ Spotlight*. <http://www.njspotlight.com/stories/13/03/01/farmland-assessment/> (28.02.2014).
- Ockenden, J., Franklin, M. (1995) *European Agriculture. Making the CAP Fit the Future*. The Royal Institute of International Affairs. Pinter Publishers London.

- OECD (2000). *A Matrix Approach to Evaluating Policy: Preliminary Findings from PEM Pilot Studies of Crop Policy In the EU, the USA, Canada and Mexico*. OECD Directorate for Food, Agriculture and Fisheries Trade Directorate. Paris.
- OECD (2001). *Multifunctionality. Towards an analytical framework*. Paris.
- OECD (2009). *The Bioeconomy to 2030: Designing a Policy Agenda*; Organisation for Economic Co-operation and Development (OECD). Paris: 326. <http://www.oecd.org/futures/long-termtechnologicalsocietalchallenges/thebioeconomyto2030designingapolicyagenda.htm> (20.02.2016).
- OECD (2010). *OECD'S Producer Support Estimate and Related Indicators of Agricultural Support Concepts, Calculations, Interpretation and Use*. Paris 2010.
- OECD (2015). *Agricultural Policy Monitoring and Evaluation*. OECD Publishing. Paris.
- OECD(2016). *Agricultural support estimates (Edition 2015)*. OECD Agriculture Statistics (database). DOI: <http://dx.doi.org/10.1787/data-00737-en> (17.01.2016).
- Olper, A. (1998). *Political Economy Determinants of Agricultural Protection Levels in EU Member States: An Empirical Investigation*. *European Review of Agricultural Economics*. No. 25: 463-487.
- Olson, M. (1965). *The Logic of Collective Action. Public Goods and the Theory of Groups*. Harvard University Press. Cambridge.
- Palimąka, K., Gumieniak, A. (2014). *Wybrane metody pomiaru kapitału intelektualnego [in:] Przedsiębiorczość i zarządzanie w gospodarce opartej na wiedzy*, Mieszajkina E. (ed.), Wydawnictwo WSPiA, Lublin: 211-212.
- Palmquist, R.B., Danielson, L.E. (1989). *A hedonic study of the effects of erosion control and drainage on farmland values*. *Am. J. Agric. Econ.* No. 71: 55-62.
- Parente, S. L., Prescott, E. C. (1994). *Barriers to Technological Adoption and Development*. *Journal of Political Economy*. Vol. 102.
- Pareto, V. (1896). *Cours d'Economie Politique*. F. Rouge. Lausanne. Vol. 2.
- Pawłowska-Tyszko, J., Soliwoda, M. (2014). *Agricultural Farm Income and Competitiveness of the Tax Insurance System*. Wydawnictwo Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej PiB. Warsaw.
- Pearce, D.W., Turner, K. (1990). *Economics of Natural Resources and the Environment*. New York.
- Pecorino, P. (2015). *Olson's logic of Collective Action at fifty*. *Public Choice*. N. 162: 243-262.
- Pengue, W.A. (2005a). *Transgenic crops in Argentina: the ecological and social debt*. *Bulletin of Science, Technology & Society*. No. 25: 314-322.
- Piketty, T. (2015). *Kapitał w XXI w.* Wyd. Krytyki Politycznej. Warsaw: 65, 68, 71, 204.
- Pilková, A., Papula, J., Volná, J., Holienka, M. (2013). *The influence of intellectual capital on firm performance among Slovak SMEs*. *Proceedings of the 10th International Conference on Intellectual Capital, Knowledge Management and Organisational Learning*. Academic Conferences and Publishing International Limited: 330-331.
- Pincus, J. (1975). *Pressure groups and the pattern of tariffs*. *Journal of Political Economy*. No. 83: 757-778.
- Poczta, W. (2015). *Możliwości trwałego i zrównoważonego rozwoju rolnictwa – refleksje na tle Deklaracji Warszawskiej*. [in:] *Ekonomia jest piękna?* Hardt, Ł., Milczarek-Andrzejewska, D. (eds.). Wyd. Naukowe Scholar. Warsaw. 423-438.
- Poczta, W., Mrówczyńska-Kamińska, A. (2008). *Regionalne zróżnicowanie wykorzystania kapitału ludzkiego w rolnictwie polskim*. [in:] *Rozwój zasobów kapitału ludzkiego obszarów wiejskich*. *Studia i Prace Wydziału Nauk Ekonomicznych*. Szczecin University. Szczecin: 309-316.

- Poczta, W., Sadowski, A., Czubak, W., Drygas, M., Nurzyńska, I., Skórnicki, H. (2014). Przyszłość Wspólnej Polityki Rolnej i jej drugiego filara rozwoju obszarów wiejskich na lata 2014-2020. training materials. December.
- Poczta, W., Szuba-Barańska, E., Beba, P., Czubak, W. (2015). Gospodarstwa rodzinne w UE – ich strukturalna i ekonomiczna różnorodność a możliwości rozwoju. *Więś i Rolnictwo*. No. 1.1 (166.1). 59-77.
- Poczta-Wajda, A. (2013). The Role of Olson's Interest Groups Theory in Explaining the Different Level of Agricultural Support in Countries with Different Development Level. *Economic Science for Rural Development*. No. 30: 76-80.
- Poczta-Wajda, A. (2014). Assistance to agriculture in countries of different development level and trends in world trade with agricultural products. *Roczniki Naukowe SERiA*. Vol. XVI(6): 403-408.
- Poczta-Wajda, A. (2015). Feeling of Relative Deprivation as a Driver for Higher Agricultural Subsidies. *Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego (SGGW) w Warszawie. Problemy Rolnictwa Światowego*. Vol. 15 (4): 156-165.
- Poczta-Wajda, A., Góral, J., Kulawik, J., Kambo, K., Osuch, D., Płonka, R., Wąs, A., Soliwoda, M. (2015). *Subsydia a ekonomika, finanse i dochodu gospodarstw rolnych (1)*. Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej. Państwowy Instytut Badawczy. Warsaw.
- Poczta-Wajda, A., Kałowska, J. (2016). Role of natural conditions in qualified agritourism – case of Poland. *Agricultural Economics*. Vol. 62(4).
- Polcyn, J. (2014). Analiza efektywności edukacji na przykładzie podregionu pilskiego – wkład do samorządowej polityki społecznej. In: Bugajski, T.(ed.), *Polityka społeczna i jej wpływ na rozwój gospodarczy województwa wielkopolskiego. Zarys problematyki*. Wydawnictwo Adam Marszałek:167-180.
- Polcyn, J. (2015). Education as a public good. *ВІСНИК Бердянського університету менеджменту і бізнесу*, nr 1(29)/2015:32-35.
- Popkin, J. (1984). The Business Cycle at Various Stages of Process. *Journal of Business & Economic Statistics*. Vol. 2. No. 3: 215-222.
- Posner, R. (1975). The social costs of monopoly and regulation. *Journal of Political Economy*. No. 83: 807-827.
- Poulton, C., Kydd, J., Wiggins, S., Dorward, A. (2006) State intervention for food price stabilization in Africa: Can it work? *Food Policy*. Vol. 31: 343.
- Powęska, H. (2005). Zmienność i rozwój funkcji obszarów wiejskich. *Acta Scientiarum Polonorum. Oeconomica*. No. 4.
- Putting family farmers first to eradicate hunger. (2014). Rome: <http://www.fao.org/news/story/en/item/260535/icode/>. (15.02.2016).
- Putzhuber, F., Hasenauer, H. (2010). Deriving sustainability measures using statistical data: a case study from the Eisenwurzen. Austria. *Ecological Indicators*. No. 10(1): 32-38.
- Rabinowicz, E. (2003). Swedish Agricultural Policy Reform. Swedish Institute for Food and Agricultural Economics. Workshop on Agricultural Policy Reform and Adjustment. Imperial College. Wye. October 23-25.
- Raczyński, M. (1998). Monopol w teorii pogoni za rentą. [in:] Raczyński M., Sztaba S., Walczykowska A. (eds.) *W pogoni za rentą*. Oficyna Wydawnicza READ ME. Warsaw: 7-20.
- Raport pełny z badania (2014), Rynek pracy na obszarach wiejskich w Wielkopolsce. Determinanty, możliwości i ograniczenia rozwoju, Samorząd Województwa Wielkopolskiego. Wojewódzki Urząd Pracy w Poznaniu. http://www.obserwatorium.wup.poznan.pl/att/analizy/Rynek_pracy_na_obszarach_wiejskich_w_Wielkopolsce._Determinanty__mo_zliwo__ci_i_ograniczenia_rozwoju.pdf. (3.01.2016).

- Rausser, G., Roland, G. (2010). Special Interests versus the Public Interest in Policy Determination. (in:) *The Political Economy of Agricultural Price Distortions*. (ed.) K. Anderson. Cambridge University Press. New York.
- Rausser, G., Swinnen, J., Zusman, P. (2011). *Political Power and Economic Policy: Theory, Analysis and Economic Applications*. Cambridge University Press. New York.
- Reed, M., Fraser, E., Dougill, A. (2006) An adaptive learning process for developing and applying sustainability indicators with local communities. *Ecological Economics*. No. 59(4): 406-418.
- Regulation (Ec) No 258/97 Of The European Parliament And Of The Council of 27 January 1991 concerning novel foods and novel food ingredients: 6. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31997R0258&from=EN> (18.02.2016).
- Ricardo, D. (1817). *On the Principles of Political Economy and Taxation*. John Murray. London.
- Ridker, Ronald G., and John A Henning (1967). The Determinants of Residential Property Values with Special Reference to Air Pollution. *The Review of Economics and Statistics*. Vol. 49. No 2, 246-57.
- RISE (2009). Public goods from private land. RISE Task Force.
- Robinson J. (1948). *The economics of imperfect competition*. Wyd. MacMillan. London.
- Rogall, H. (2010). *Ekonomia zrównoważonego rozwoju. Teoria i praktyka*. Wyd. Zys i s-ka: 24.
- Rojewski, M., Rychlik, T., Stańko, S. (1987). Czynniki kształtujące poziom produkcji i dochodów w rolnictwie. Wydawnictwo PWRIL. Warsaw.
- Rowley, C., Tollison, R., Tullock, G. (1988). *The Political Economy of Rent Seeking*. Kluwer Academic Publishers. Boston.
- Rutherford, T.F., Whalley, J., Wigle, R.M. (1990). Capitalization, conditionality, and dilution: land prices and the US wheat program. *J Policy Model*. Vol. 12(3): 605–622.
- Sadowski, A. (2012). Zrównoważony rozwój gospodarstw rolnych z uwzględnieniem wpływu Wspólnej Polityki Rolnej Unii Europejskiej. Wyd. Uniwersytetu Przyrodniczego w Poznaniu: 368.
- Sadowski, A. (2015a). Zaspokojenie bezpieczeństwa żywnościowego wybranych regionów świata a realizacja zasady zrównoważonego rozwoju. [in:] *Problemy rozwoju rolnictwa i gospodarki żywnościowej w pierwszej dekadzie członkostwa Polski w Unii Europejskiej*. Czyżewski, A., Klepacki, B. (eds.). Wyd. PTE. Warsaw. 401-419.
- Sadowski, A., (2015b). Emisja rolniczych gazów cieplarnianych w kontekście zmian produkcji rolnej na świecie. Materiały z II edycji Europejskiego Kongresu Menadżerów Agrobiznesu <http://www.kongresagrobiznesu.pl/prez/8.pdf> (15.03.2016).
- Sadowski, A., Giżycka W. (2012). Charakterystyka gospodarstw korzystających ze wsparcia inwestycji modernizacyjnych i dostosowawczych na tle innych form pomocy Unii Europejskiej. *Journal of Agribusiness and Rural Development*. No. 1(23): 123-124.
- Salhofer, K., Schmid, E. (2004). Distributive Leverages from Agricultural Support. Some Empirical Evidence. *Agricultural Economics*. Vol. 30. Issue 3: 60.
- Samuelson, P.A. (1951). *Economics*. McGraw-Hill. New York.
- Samuelson, P.A. (1954). A pure theory of public expenditure. *The Review of Economics and Statistics* 1954. no. 36(4): 387-389.
- Samuelson, P.A. (1955). Diagrammatic Exposition of a Theory of Public Expenditure. *Review of Economics and Statistics*. Vol. 11. No. 37.
- Sandler, T. (2015). Collective action: fifty years later. *Public Choice*. No. 164: 195-216.
- Scatasta, S., Wesseler, J., Demont, M. (2006). A Critical Assessment of Methods for Analysis of Social Welfare Impacts of Genetically Modified Crops: a Literature Survey. Mansholt Working Paper. Wageningen.

- Schmid, O., Padel, S., Levidow, L. (2012). The Bio-Economy Concept and Knowledge Base in a Public Goods and Farmer Perspective. *Bio-Based Appl. Econ* 1(1): 47-63. http://orgrprints.org/20942/1/SCHMID_BAE_2012_10770-18316-1-PB.pdf (21.02.2016)
- Schmitz, A., Moss, C., Schmitz, T., Furtan, H., Schmitz, H. (2010). *Agricultural Policy, Agribusiness, and Rent-Seeking Behaviour*. University of Toronto Press. Toronto.
- Schultz, T.W. (1953). *The Economic Organization of Agriculture*. McGraw-Hill. New York: 102ff.
- Schultz, T.W. (1964). *Transforming Traditional Agriculture*. Yale University Press. New Haven.
- Schultz, T.W. (1968). *Economic Growth and Agriculture*. McGraw-Hill. New York.
- Schumpeter, J.A. (1960). *Teoria rozwoju gospodarczego*. PWN. Warsaw: 104.
- Sedláček, T. (2012). *Ekonomia dobra i zła*. Wyd. Studio EMKA. Warsaw.
- Sherrick, B., Kuethe, T. (2014). Impact of Recent Changes in the Illinois Farmland Assessment Act. *Farmdoc Daily*. <http://farmdocdaily.illinois.edu/2014/01/impactsrecent-changes-illinois-farmland-assessment-act.html> (28.02.2014).
- Siemiński, P., Poczta, W. (2014). Możliwości rozwoju agroturystyki i turystyki wiejskiej w ramach PROW 2007-2013 i 2014-2020. *Roczniki Naukowe SERIA*. Vol. XVI. No. 6: 433; 435-436.
- Skoba, L. (2013). *Principal EU-US trade disputes*. Library Briefing. Library of the European Parliament. Brussels.
- Skrzypek, E. (2007). Kapitał intelektualny jako podstawa sukcesu organizacji w społeczeństwie wiedzy. <http://www.institut.info/IIIkonf/referaty/3c/Skrzypek.pdf> (15.12.2015).
- Smeets E., Tsiropoulos Y., Patel M., Hetemäki L., Bringezu S., Banse M., Junker F. (2015). Working paper D1.1 The relationship between bioeconomy sectors and the rest of the economy: 30. [http://www3.lei.wur.nl/SATBBE_Publications/SAT-BBE%20-%20WP%201%20-%20Deliverable%201.1%20\(11-01-2013\).pdf](http://www3.lei.wur.nl/SATBBE_Publications/SAT-BBE%20-%20WP%201%20-%20Deliverable%201.1%20(11-01-2013).pdf) (15.02.2016).
- Smędzik-Ambroży, K. (2012). Factors affecting technical efficiency of individual farms specialising in livestock production (for FADN farms of the gostyński district). *Journal of Agribusiness and Rural Development*. Vol. 3(25): 241-250.
- Smędzik-Ambroży, K. (2013) Impact of Direct Payments on Sustainability of Farms in Poland – Simulation Based on the Example of FADN Farms from Wielkopolska and Slask Region, *Economic Science for Rural Development*. Vol. 30: 81-86.
- Smith, A. (1954). *Badania nad naturą i przyczynami bogactwa narodów*. PWN. Warsaw: 358.
- Sobiecki, R. (2010). Kryzysy rolne a bezpieczeństwo żywnościowe. (in:) *Przedsiębiorstwo a kryzys globalny*. R. Sobiecki, J.W. Pietrewicz (eds.). Wyd. Szkoły Głównej Handlowej w Warszawie. Warsaw: 67-68.
- Solow, R.M. (1974). The economics of resources or the resources of economics. *American Economic Review*. Vol. 40.
- Sopińska, A. (2010). Wiedza jako strategiczny zasób przedsiębiorstwa: analiza i pomiar kapitału intelektualnego przedsiębiorstwa, *Oficyna Wydawnicza Szkoły Głównej Handlowej*, Warsaw: 130, 133, 134.
- Stanisz, A. (2007). *Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny*. Tom 2. Modele liniowe i nieliniowe. StatSoft. Kraków 2007: 247.
- Stevenson, F., Ball, J. (1998). Sustainability and materiality: the bioregional and cultural challenges to evaluation. *Local Environment*. No. 3(2): 191-209.
- Stewart, T.A. (1997). *Intellectual Capital: The New Wealth of Organisations*. London: 56-59.
- Stępień, S., Czyżewski, A. (2009). Reforma mechanizmu WPR w ramach „Health Check” a potrzeba stabilizacji rynków rolnych UE. [in:] Adamowicz M. (ed.). *Wspólna Polityka Rolna Unii Europejskiej*. Uwarunkowania, mechanizmy, efekty. SGGW. Warsaw: 37-50.
- Stępień, S., Czyżewski, A. (2012). Dostosowania mechanizmów wspólnej polityki rolnej do oczekiwań państw członkowskich. *Ekonomista*. No. 2: 145-174.

- Sustainable growth from bioeconomy. The Finnish Bioeconomy Strategy, Edita Prima Ltd (2014): 17. https://www.tem.fi/files/40366/The_Finnish_Bioeconomy_Strategy.pdf (1.03.2016).
- Sveiby, K.E. (1997). *The New Organisational Wealth: Managing and Measuring Knowledge-Based Assets*. Berrett-Koehler Publishers. San Francisco.
- Sveiby, K.E. (2010). *Methods of Measuring Intangible Assets*, <http://www.sveiby.com/articles/IntangibleMethods.htm> (16.11.2015).
- Swinnen, J. (2008). *The Political Economy of Agricultural Distortions. The Literature to Date*. Paper for the IATRC meeting. Scotsdale.
- Swinnen, J. (2010a). *The Political Economy of the Most Radical Reform of the Common Agricultural Policy*. GJAE 59. Supplement: Perspectives on International Agricultural Policy. http://ageconsearch.umn.edu/bitstream/146510/2/5_Swinnen.pdf. (1.03.2016)
- Swinnen, J. (2010b). *The political economy of agricultural distortions: The literature to date*. [in:] Anderson K. (ed.). *The Political Economy of Distortions to Agriculture*. Cambridge University Press. Cambridge and New York.
- Sztaba, S. (1998). *Pogoń za rentą w Polsce*. [in:] Raczyński M., Sztaba S., Walczykowska A. (eds.) *W pogoni za rentą*. Oficyna Wydawnicza READ ME. Warsaw: 47-51, 85-96, 116-117.
- Sztaba, S. (2002). *Aktywne poszukiwanie renty. Teoria. Przykłady Historyczne. Przejawy w polskiej gospodarce lat dziewięćdziesiątych*. SGH. Warsaw: 34.
- Tangermann, S. (2005). *Is the Concept of the Producer Support Estimate in Need of Revision?* OECD. Food, Agriculture and Fisheries Working Paper. No. 1: 11.
- Teng, J. (2013a). *Rent Seeking Contest and Indirect Risk Preference*. *Rev. Integr. Bus. Econ. Res.* Vol 2(1).
- Teng, J. (2013b). *A Theory of Complementarity Between Rent Seeking and Production*. *Rev. Integr. Bus. Econ. Res.* Vol 2(1).
- The State of Food and Agriculture. Innovation in family farming* (2014). Rome: FAO. 8-27.
- Thirtle, C., Lin, L., Holding, J., Jenkins, L., Piesse, I. (2004). *Explaining the Decline in UK Agricultural Productivity Growth*. *Journal of Agricultural Economics*. No. 55 (2).
- Tietenberg, T. (2006). *Environmental Natural Resource Economics*. 7th Ed. Pearson Education. Inc. New York –London.
- Timoshenko, V. (1930). *The Role of Agricultural Fluctuations in the Business Cycle*. *Michigan Business Studies*. Vol. 2. No. 9.
- Tollison, R. (1982). *Rent Seeking: A Survey*. *Kyklos*. No. 35: 575-602.
- Tollison, R. (2012). *The economic theory of rent seeking*. *Public Choice*. No. 152: 73-82.
- Tollison, R., Wagner, R. (1991). *Romance, realism, and economic reform*. *Kyklos*. No. 44: 57-70.
- Tomczak F. (1997). *Gospodarstwo rodzinne i jego ewolucja. W: Gospodarstwo rolnicze wobec wymogów współczesnego rynku i Unii Europejskiej*. Warsaw: Wyd. SGGW, Warsaw: 26-27.
- Tomczak, F. (2009). *Ewolucja wspólnej polityki rolnej UE i strategia rozwoju rolnictwa polskiego*. Program Wieloletni 2005-2009. IERiGZ-PAN. Warsaw.
- Tomek, W.G., Robinson, K.L. (2001). *Kreowanie cen artykułów rolnych*. Wyd. Naukowe PWN. Warsaw: 169.
- Torvik, R. (2001). *Natural resources, rent seeking and welfare*. *Journal of Development Economics*. Vol. 67.
- Troncoso, J.L., Aguirre, M., Manriquez, P., Labarra, V., Ormazábal, Y. (2010). *Influence of physical attributes on the price of land: the case of the Province of Talca, Chile*. *Ciencia e Investigacion Agraria*. Vol. 37: 105-112.
- Tullock, G. (1967). *The welfare costs of tariffs, monopolies, and theft*. *Western Economic Journal*. No. 5(3): 224-232.
- Tullock, G. (1980a). *Efficient Rent Seeking*., Buchanan, Tollison & Tullock.

- Tullock, G. (1980b). Rent seeking as a negative-sum game. (in:) *Toward a theory of the rent-seeking society*. (eds.) J. Buchanan, R. Tollison and G. Tullock. Texas A&M University Press. College Station.
- Tullock, G. (1991). *Rent Seeking*. [in:] Eatwell, J., Milgate, M., Newman, P. *The New Palgrave The World of Economics*, New York and London, W.W. Horton.
- Ulbrich, H. (2003). *Public finance in theory and practice*. South-Western Educational Publishing. Cincinnati: 67.
- Uphoff, N. (ed.) (2002). *Agroecological Innovations: Increasing Food Production with Participatory Development*. Earthscan Publications Ltd. London.
- Urban, S., Michałowska, M. (2015). Wpływ relacji z otoczeniem na ekonomiczno-społeczny wymiar funkcjonowania małych i średnich przedsiębiorstw w województwie lubuskim. *Ekonomia XXI wieku*. No. 1(5): 9-26.
- Urbanek, G. (2008). Wycena aktywów niematerialnych przedsiębiorstwa, *Polskie Wydawnictwo Ekonomiczne*, Warsaw: 106, 107, 128, 200, 214, 215.
- USDA (2011). *Biobased Economy Indicators*. Office of the Chief Economist. Office of Energy Policy and New Uses (OEPNU). U.S. Department of Agriculture. Prepared jointly by OEPNU and the Center for Industrial Research and Service of Iowa State University: 123. http://www.ciras.iastate.edu/publications/Biobased_Economy_Indicators.pdf (21.02.2016).
- Van Zeijl-Rozema, A. (2010) An adaptive indicator framework for monitoring regional sustainable development: a case study of the INSURE project in Limburg, The Netherlands. *Sustainability: Science, Practice & Policy*. Vol.6. <http://ejournal.nbii.org>.
- Vatn, A. (2010). *Transaction Costs And Multifunctionality*, conference materials – Directorate for Food, Agriculture And Fisheries Workshop on Multifunctionality, Paris, 2-3 July (13.03.2012), <http://www.oecd.org/dataoecd/27/36/37633999.pdf>.
- Wadho, W.A. (2014). *Rent Seeking And The Curse Of Natural Resources*. *Economics&Politics*. No. 1, Vol. 26.
- Wallis, A. (2006). Sustainability indicators: is there consensus among stakeholders? *International Journal of Environment and Sustainable Development*. No. 5(3): 287-296.
- Wasson, J.R., McLeod, D.M., Bastian, C.T., Rashford, B.S. (2013). The Effects of Environmental Amenities on Agricultural Land Values. *Land Economics*. Vol. 89. No. 3: 466-478.
- White House (2012). *National Bioeconomy Blueprint*: Washington, DC, USA: 48. https://www.whitehouse.gov/sites/default/files/microsites/ostp/national_bioeconomy_blueprint_april_2012.pdf (1.03.2016).
- Why do we need a common agricultural policy? (2009). Discussion paper by DG Agriculture and Rural Development. European Commission. Brussel. December.
- Wilén, J. (1989). *Rent Generation in Limited Entry Fisheries*. [in:] Neher, P. A., Arnason, R., Mollet, N. (eds.). *Rights Based Fishing*. Dordrecht. Kluwer.
- Wilkin, J. (1986). *Współczesna kwestia agrarna*. PWN. Warsaw: 13-14, 67.
- Wilkin, J. (1995). *Jaki kapitalizm, jaka Polska*. PWN. Warsaw.
- Wilkin, J. (2010). Dobra dostarczane przez rolnictwo w świetle teorii dóbr publicznych. [in:] J. Wilkin (ed.) *Wielofunkcyjność rolnictwa. Kierunki badań, podstawy metodologiczne i implikacje praktyczne*. Instytut Rozwoju Wsi i Rolnictwa Polskiej Akademii Nauk. Warsaw: 41-52.
- Wilkin, J. (2012). Pogoń za rentą za pomocą mechanizmów politycznych. (in:) *Teoria wyboru publicznego. Główne nurty i zastosowania*, (ed.) J. Wilkin. Wydawnictwo Naukowe SCHOLAR. Warsaw.
- Wilson J., Wildasin, D. (2004). Capital tax competition: bane or boon. *Journal of Public Economics*. Vol. 88. Issue 6: 1065-1091.
- Wilson, J. (2004). Capital Tax Competition: Bane or Boon. *Journal of Public Economics*: 270-304.

- Wise, T.A. (2004). The Paradox of Agricultural Subsidies: Measurement Issues, Agricultural Dumping, and Policy Reform. Global Development and Environment Institute Working Paper. No. 2: 8.
- Witzke, P. Kempen, M., Pérez Domínguez, I., Jansson, T., Sckokai, P., Helming, J., Heckelei, T., Moro, D., Tonini, A., Fellmann T. (2009). Regional Economic Analysis of Milk Quota Reform in the EU. European Commission. Joint Research Centre. Institute for Prospective Technological Studies. Luxembourg.
- Wojtyna, A. (1988). Nowe trendy w zachodniej teorii ekonomii. Wydawnictwo Akademii Ekonomicznej w Krakowie. Kraków:96-102.
- Wojtyna, A. (2008). Współczesna ekonomia – kontynuacja czy poszukiwanie nowego paradygmatu. *Ekonomista*. No. 1.
- World Bank website: <http://econ.worldbank.org/external/default/main?pagePK=64214825&piPK=64214943&theSitePK=469382&contentMDK=21960058> (1.01.2016).
- Woś, A. (1998). Rozwój zrównoważony. [in:] A. Woś (ed.). *Encyklopedia agrobiznesu*. Fundacja Innowacja. Warsaw: 740.
- Woś, A. (2003). Konkurencyjność polskiego sektora żywnościowego. *Synteza. IERiGŻ*. Warsaw: 24-25, 27, 54.
- Woś, A. (2006). Waloryzacja zasobów i czynników wytwórczych rolnictwa. Nowe kryteria wyboru. *IERiGŻ*. Warsaw.
- Woś, A., Tomczak, F. (1983). *Ekonomika rolnictwa. Zarys teorii*. 2nd Ed.. Wyd. PWRiL. Warsaw.
- Woś, A., Tomczak, F. (1984). *Ekonomika rolnictwa. Zarys teorii*. Wydawnictwo PWRiL. Warsaw.
- Woś, A., Zegar, J.S. (2002). *Rolnictwo społecznie zrównoważone. IERiGŻ*. Warsaw.
- Woś, A., Zegar, J.S. (2004). Rolnictwo społecznie zrównoważone – w poszukiwaniu nowego modelu dla Polski. *Więś i Rolnictwo*. No. 3. 9-23.
- Wójcik, G. (2011). Znaczenie i uwarunkowania innowacyjności obszarów wiejskich w Polsce. *Wiadomości Zootechniczne* Vol. XLIX No. 1: 161-168.
- Wrzaszcz, W. (2012). Poziom zrównoważenia indywidualnych gospodarstw rolnych w Polsce (na podstawie danych FADN). Wyd. IERiGŻ-PIB. Warsaw: 252.
- www.bankier.pl/gielda/notowania/akcje/KSGAGRO/wyniki-finansowe/skonsolidowany/roczny/standardowy (22.11.2015).
- www.ksgagro.com/Po/ (22.11.2015).
- www.worldbank.org/agdistortions (20.10.2014).
- Zachariasse, L.C. (1977). The analysis of variations in farm incomes on arable farms. *European Review of Agricultural Economics*. Vol. 4, issue 2.
- Zawajska, A. (2011). Pogoń za rentą i lobbng we wspólnej polityce rolnej Unii Europejskiej. *Roczniki Nauk Rolniczych. Seria G*. No. 98(3): 63-72.
- Zegar, J. (2001). Przesłanki i uwarunkowania polityki kształtowania dochodów w rolnictwie. *Studia i monografie*. No. 107, Warsaw.
- Zegar, J. (2002). Kwestia dochodów chłopskich. Ubezpieczenia w rolnictwie. *Materiały i Studia*. No. 1(13).
- Zegar, J.S. (2004). Dochody w strategii rozwoju rolnictwa (na progu integracji europejskiej). *IERiGŻ*. Warsaw.
- Zegar, J.S. (2007). Społeczne aspekty zrównoważonego rozwoju rolnictwa. [in:] *Fragmenta Agronomica. IUNG*. No. 4(96): 297.
- Zegar, J.S. (2008). Konkurencyjność rolnictwa w dobie globalizacji. *Roczniki Naukowe Seria. Tom X. Zeszyt 1*: 503-514.
- Zegar, J.S. (2010). *Ekonomia wobec kwestii agrarnej. Ekonomista*. No. 6: 779-803.

- Zegar, J.S. (2012). Współczesne wyzwania rolnictwa. Wydawnictwo Naukowe PWN. Warsaw. 49-53.
- Zegar, J.S. (2015). Kwestia bezpieczeństwa żywnościowego a ekonomia. [in:] Problemy rozwoju rolnictwa i gospodarki żywnościowej w pierwszej dekadzie członkostwa Polski w Unii Europejskiej. Czyżewski, A., Klepacki, B. (eds.). Wyd. PTE. Warsaw: 441-456.
- Zielińska, Z. (1979). Długookresowe przemiany struktury żywności na tle wzrostu dochodów. Zakład Wydawnictw Naukowych Instytutu Handlu Wewnętrznego i Usług. Warsaw.
- Zieliński, K. (2002). Elastyczność podaży produktów rolniczych w Polsce. Wyd. Akademii Ekonomicznej w Krakowie.
- Zilahy, G., Huisingh, D., Melanen, M., Phillips, V., Sheffy, J. (2009). Roles of academia in regional sustainability initiatives: outreach for a more sustainable future. *Journal of Cleaner Production*. No. 17(12): 1053-1056.
- Zodrow, G., Mieszkowski, P. (1986). Pigion, Tiebout, property taxation and the underprovision of local public goods. *Journal of Urban Economics*: 357-370.

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This book has been prepared by a team of researchers from six renowned academic centres in the field of agricultural economics in Poland. It aims not only to extend the paradigm of sustainable development and the concept of political rent, but also to present the results of empirical studies carried out using data from 27 EU member states for the years 1995-2014 (some of the analyses also go back to the 1950s) together with Polish case studies. Viewing the EU's Common Agricultural Policy from the standpoint of the theory of rent seeking is a relatively uncommon approach, particularly as the authors draw attention to the need to predefine the concept of political rent received by farmers in a situation where they are supplying public goods.

The monograph certainly encourages a wide spectrum of readers – researchers, policy makers, students, and society at large – to read and study this publication, as well as to use it in their usual business (...) The authors develop four leading research hypotheses: the first one questions the completeness of the current conceptual approach to political rents in agriculture on the ground that it does not take into account the creation of public goods by the sector. The second hypothesis stresses the need for going beyond the current rent-seeking concept for political rents in the case of sustainable agriculture. The third one states that despite the common – EU wide – agricultural policy, there are still different models of rent seeking in individual countries. The last hypothesis questions the universality of the so-called European Agricultural Model forced by EU policy makers. The verification of these hypotheses in the book certainly brings an additional value to the science.

Professor Katarzyna Zawalińska



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