INSTITUTE OF AGRICULTURAL AND FOOD ECONOMICS
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Achievements and challenges in the food sector and rural areas during the 10 years after EU enlargement

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

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The purpose of the study is to analyze the achievements and challenges facing the food sector and rural areas in selected European countries in ten years after the EU enlargement.

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Foreword

In May 2014, ten years have passed from the subsequent enlargement of the European Union (EU), this time by ten Central and Eastern European countries. The modern EU is already an entity consisting of 28 Member States inhabited by 507 million people, with an area of more than 4.2 million km^2. Its economic potential is comparable to the one of the United States, and the share in world GDP (expressed as the value of purchasing power) is approximately 21%. The historic decision on EU enlargement made 10 years ago has brought multilateral benefits across Europe. The common European market was opened to products from the new Member States and allowed free trade without barriers or restrictions, in accordance with the principles of free competition. European labour markets gradually opened to the new Member States. Such opportunities for cultural and scientific exchange and for the transfer of ideas have been unprecedented in the history of Europe to date. They have been particularly important for the young generation from the new Member States. One must not forget, however, that the benefits have been mutual. The EU-15 have gained new markets for their products, new contractors, supply of cheap and skilled labour force, and room for technological expansion. The "new" Member States have received substantial grants from the EU budget, including a variety of structural and sectoral funds enabling regional development. Common Agricultural Policy funds form a crucial part of financial aid. Although all new Member States wanted to benefit from the integration as much as possible, not all of them managed to achieve it to the same extent.

Anniversary of the enlargement of the EU is a great opportunity to make the evaluations and summaries of previous period. The public debate is focused primarily on the compilation of costs and benefits. In the new Member States, the dominant voices proved that the balance of membership is beneficial although there are also sceptics of integration, especially in environments for which the increased competition proved to be too challenging. Similar opinions were expressed in the EU-15, who emphasised the impact of integration on the increase in investment opportunities for businesses and on the increase in demand for their products and services. Moreover, attention was paid to the Community dimension of this process, emphasising mainly the strengthening of the political and economic position of both the EU as a whole and of each of its Member States.

One of the commonest to all Member States areas of EU activity is the agricultural policy. These matters form the largest part of the EU legislation. In the EU budget for 2007-2013, EUR 420.6 billion (prices as of 2011), i.e. 42.3% of the EU budget, has been allocated to agriculture (in years 2014-2020, it would be EUR 373.1 billion and 38,8%, accordingly).

Therefore, analysis of the process of integration to date in this area is not only necessary, but also particularly interesting. Before 2004, the extension of the Common Agricultural Policy (CAP) to cover the east of Europe has often been referred to as the greatest challenge for the European institutions, the EU--15, and the candidate countries. The directions of this policy after enlargement was the subject of many discussions. Coordination of the systems that had been such diverse in economic, social and cultural terms seemed difficult to address. Moreover, very often the highest scepticism towards the envisaged changes was expressed by the group of recipients of the agricultural policy. They voiced their justified concerns about the outlook for the agri-food sector, the future level of famers' income, or agricultural land ownership issues. However, after ten years, it can be concluded that many of those concerns are no longer valid. Agriculture and rural areas in most of the new Member States have become the main beneficiaries of the enlargement. In years 2004-2012, the balance of cash flows in all new Member States was definitely positive. During that period, after the deduction of the membership fees, Poland received net payments amounting to EUR 52.1 billion from the EU budget.

Evaluation of the costs and benefits of European integration for the food industry coincided with the new financial perspective for the EU and the beginnings of the introduction of the new CAP in 2014-2020. It is known that, under the abovementioned policy, substantial funds are to be allocated in the coming years. In many cases, such as in the case of Poland, the scale of public support for agriculture and rural areas will be higher than in the past. In 2014-2020, the total amount of support allocated to direct payments and rural development will exceed EUR 32 billion, i.e. almost 3.5 billion more than in 2007-2013. At the same time, it is believed that due to the economic crises and the political situation, such a significant aid might not be granted again in the future. Therefore, each Member State is facing the dilemma regarding the best methods and the appropriate level of support allocated to specific areas of agribusiness.

The abovementioned matters have been discussed at the international conference **"Achievements and challenges in the food sector and rural areas during the 10 years after EU enlargement"**, organised by the Institute of Agricultural and Food Economics – National Research Institute in Rawa Mazowiecka from 12 to 14 May 2014. Seventeen research papers were presented during the six plenary sessions, panel discussion and workshops. The debates focused on the changes that have occurred as a result of accession negotiations after the EU enlargement in 2004, mainly in the field of agri-food processing, rural development and agriculture. This publication, which presents

the scientific achievements of the conference, consists of fifteen chapters, divided into three sections:

I. Finance, regulations and efficiency of farms,
II. Structural changes and competitiveness of the food industry,
III. Human capital and rural development.

The authors of the studies, who participated in the conference, represent many Polish and foreign research centres. Below we present a brief introduction to each chapter, hoping that it will encourage you to read the whole volume.

There are different methods of regulating markets. Part of them falls beyond the scope of traditional government mechanisms and is based on the institutions established by various other actors. An example of organising economic activity is the European agri-food policy, which focuses, *inter alia*, on sustainable development and food security. B. Pacheco de Carvalho analyses the problem of imbalance in food security, both at the global and the local level. Regardless of the sufficient supply of food at the global level, in many areas of the world people are starving. In the opinion of the Portuguese economist, this situation is an example of the conditions where institutional aid fails. Therefore, great organisational potential of the food systems in developed countries, such as the CAP, should be used accordingly to the benefit of poor countries. This includes the appropriate support, based primarily on the transfer of knowledge, institutions and organisations, instead of technological solutions.

Different methods of market organisation may result in the emergence of additional, often previously unforeseen, effects. An example of such side effect of public intervention in the economy is the capitalisation of subsidies in the agricultural sector. In the second chapter, J. Kulawik and J. Góral argue that the most important instrument of agricultural support under the CAP, i.e. direct payments, in recent years significantly accelerated growth of the value and prices of fixed assets in agriculture in the EU. Nevertheless, the channels and the effects of the impact of subsidies on the agricultural sector are complex. Grants improved the financial potential of farms, reduced their operational risk and facilitated the adjustments and implementation of development strategies. On the other hand, such form of assistance limits structural transformations and to a great extent renders public transfers inefficient. According to the authors, the European model of sustainable and multifunctional agriculture could consolidate the effects of the capitalisation of subsidies.

One of the most important problems considered during the implementation of the CAP in the new Member States was the competitiveness of the local farms on the EU market. The negligence regarding comparative advantages over other market entities could be detrimental to the profitability of economic

activity and, consequently, lead to its liquidation. The next chapter focuses on the determination of the number of competitive farms in Poland. The authors of the study, W. Józwiak, M. Zieliński and J. Sobierajewska, present how the size of this group changed before and after Poland's accession to the EU. On the basis of the analyses, the authors came to the conclusion that the number of farms competitive on the EU market had doubled or even tripled in that period. According to the estimates of the IAFE-NRI researchers, in 2010 the number of entities with these characteristics amounted to 160 thousand. The growth rate of the analysed group of farms was limited e.g. due to general reluctance to finance investments with loans and subsidies and due to management mistakes.

Competitiveness on agricultural markets is a major challenge, in particular for small farms. It is emphasised that many of the entities prevailing in the European agriculture do not play any significant role in terms of production, but they are important for other reasons, e.g. social, environmental or cultural. New methods to improve the economic viability of those farms, including the use of agricultural policy instruments, are also the subject of many discussions. This issue is analysed in the next chapter of this publication. D. Nikolov, T. Radaev and P. Borisov analyse mainly the possibility to improve the position of the abovementioned category of farms in terms of market competition on the example of the Bulgarian agriculture. In this respect, the authors point out to two key research problems: capturing the specific nature of small farms and identifying the factors that may be crucial for their development.

Bulgarian agriculture has also been discussed in the last chapter of the first section of the publication. T. Stoeva analyses the current trends in the development of ground vegetable production in the Plovdiv region. According to the author, that branch of agriculture is vital for the Bulgarian agricultural sector. However, vegetable production in Bulgaria has long been struggling with problems which could not be solved even with the use of CAP instruments. The identified challenges include e.g. inadequate organisation of production, low level of mechanisation, and insufficient cooperation between the producers.

Many challenges to the development of the food industry in Hungary have been discussed by N. Potori from the Research Institute of Agricultural Economics (AKI). His paper opens the second section of the publication devoted to structural changes and competitiveness of the food industry. In the case of Hungary, EU integration caused a deterioration of the situation in the food processing industry. Such a situation was due to many factors. In the opinion of the author, investment mistakes committed already in the transformation period, as well as inadequate economic policy, have led to the situation where at the time of full inclusion in the EU market, Hungarian companies failed to match the competition both in Hungary

and abroad. Moreover, high unemployment, economic crisis and the fiscal system were conducive to the development of the grey market in the agri-food area.

The current economic condition of the Czech industry has been presented by three authors: T. Doucha, J. Mezera and J. Nemec. They discuss the characteristic features of the whole sector and its individual branches. The analyses show that the Czech Republic's accession to the EU led to a large increase in the productivity in the agro-food industry. Nevertheless, it is still relatively low, in particular compared to the EU competition. Situation of the Czech food industry 10 years after the accession to the EU is an important premise for the new agricultural policy for 2014-2020. Support for this segment in the Czech Republic has been provided for only under the second pillar of the CAP, with the use of the instruments related to marketing and technological and organisational innovations. Those instruments will be addressed to larger enterprises and farms developing their food processing operations.

P. Szajner in his paper analyses the changes in the Polish sugar market during the EU membership. He emphasises that Polish sugar industry has been deeply restructured and modernised. Accession to the EU and adoption of the EU system of regulations, which was reformed between 2006 and 2010, played an important role in this respect. Structural and ownership changes in the industry led to the fact that the Polish sugar market has transformed from a monopolistic competition into an oligopoly. Transformations in the sugar industry resulted in significant changes in the cultivation of sugar beet, which has been concentrated in the regions with the best conditions for cultivation in terms of soil and climate. The author emphasises that the future of sugar production in the EU, including the production in Poland, will depend on the WTO negotiations. If liberalisation of the world food trade results in the reduction of customs duties, competition of sugar cane importers will increase and the production will be maintained solely in the most competitive regions of the EU.

In the next paper, S. Figiel, M. Hamulczuk, C. Klimkowski and J. Kufel have attempted to determine the impact of PLN exchange rate volatility on the dynamics of trade. The analysed data covered the period after the Polish accession to the EU. Using econometric methods, the authors sought evidence that exchange rate volatility (appreciation, depreciation) had an important impact on the Polish agri-food trade. However, the analyses showed that only a small proportion of exports volatility could be explained by fluctuations in the exchange rate of the Polish currency. Therefore, it could be assumed that the main sources of the dynamic growth of Polish agri-food exports were of a different nature. They include: effective adjustments in the period of economic transformation; cost advantage (lower labour costs); the opening of foreign markets; growing

demand for Polish products, whose compliance with the international requirements and quality standards has been increasing.

In the last article in the second section of the publication, T. Mostenska has attempted to determine the potential capacity of the bread market in Ukraine. The author points out that bread is one of the main products consumed by the average citizen of Ukraine, hence all political parties tend to use the prices of bread and bakery products in their election campaigns as a means of alleviating social tensions. This tendency hinders the development of industry and creates an illegal market for bread. Consequently, bread prices in Ukraine are among the lowest in Europe and in CIS, and the production of bread has become unprofitable for almost one half of the companies operating in the baking industry. Studies have shown that the decline of the production of bread and bakery products cannot be explained solely by the decrease in the population of Ukraine, or a lower consumption of bread. This enabled the author to estimate the size of the illegal market of bread in Ukraine.

The third section of the publication relates to human capital and rural development. This theme has been discussed in five papers. In the first study, V. Miličić, N. Driouech, H. El Bilali and S. Berjan analyse the effects of Slovenia's accession to the EU for its agricultural sector and rural areas. The analyses show that accession to the EU has increased the income of farmers, as well as provided a robust and consolidated political and institutional framework under which the national agricultural policies are implemented. Certain challenges have also emerged after the accession, e.g. the limited possibility to alleviate the competitive pressures; lack of harmonised levels of support; obstacles for small farmers; and the differences in income in rural and urban areas. The authors conclude that there are still many challenges to be faced in order to move towards a competitive, environmentally friendly and sustainable agricultural sector, economically recovered rural economies, and rural communities fostering social inclusion.

In the next chapter, V. Majerová, J. Petr and T. Pilař emphasise that the Czech society is gradually changing and increasingly reflecting Western socio-demographic trends. However, due to the social structure of the rural population, living conditions change in different ways. The percentage of the rural population employed in primary agricultural production has decreased, but unemployment still affects certain age and occupational groups. Agriculture has become one of the lowest paid industries, and certain rural population groups are affected by social exclusion. In the opinion of the authors, access to the EU helps build the economy of the Czech rural areas and influences certain social trends in the rural population.

A. Wrzochalska has attempted to analyse selected determinants of human capital formation in Polish rural areas in the last decade. The analysis included the level of education, educational activity and civilisation competences of the residents of rural areas. In the opinion of the author, improvement of the social situation (mainly the level of education and the broadly understood educational activity) of the population in rural areas has not only a civilisation, but also an economic dimension, as it has a direct impact on production intensity, openness to innovation, and management effectiveness.

In the next chapter, D. Cvijanović, B. Mihailović and P. Vuković discuss the achievements and challenges for the rural areas in Serbia before the accession to the EU. The authors emphasised that the agricultural sector in Serbia is among the largest in Europe and that in most strategic documents Serbian rural areas have been identified as areas of poverty and significant development constraints. This results from an underdeveloped and homogenous economic structure in agriculture and in the food industry. Agriculture in Serbia is based on small family farms with low productivity and low market surplus and is unable to provide adequate income to farmers for whom agriculture is the main source of earnings. At the same time, employment opportunities in rural areas are much limited. According to the authors, it is necessary to reinforce regional and local institutions which support rural development through improving the cooperation between the Ministry of Agriculture and local self-governments. It is also necessary to increase investment in rural development and to allocate funds to support the diversification of activity in the Serbian rural areas.

In the last article, N. Bencheva and M. Tepavicharova examine and analyse the main challenges to human capital in fruit-farming, one of the traditional branches of agriculture in Bulgaria. The article presents the key factors in the effective management of human capital and its development in the analysed farms. According to the authors, higher level of education of managers is essential for the development and improvement of human capital on farms specialising in fruit production. Professional experience is an important factor only in combination with innovative thinking and application of new techniques and technologies in the production.

When reflecting on the achievements of the 10 years of EU membership, one must not forget that the Common Agricultural Policy, developed from the beginning of the Community, has always been its most important pillar. The question that is important for us today is how individual countries, which joined the EU 10 years ago, have influenced the CAP: have they been a burden or have they contributed to its success? As it has been proved during the conference, the answer to this question, with all the doubts and objections, is positive.

The best evidence is the decision to continue this policy, with certain modifications, in the next 7 years. Assessments prepared by the conference participants, which present the CAP in a global perspective, confirm this fundamental conclusion. We could already formulate new prospective goals based on the evaluation and criticism of the CAP. Polish experiences could be particularly important in this respect. In the last decade, Poland has become the leader of structural and social transformations in agriculture and in the food industry. This is confirmed by the growth and technological progress in agricultural production, development of the processing industry, improved supply on the internal market and rapid expansion of foreign trade, as well as multifunctional and sustainable rural development.

Editorial Committee

I. Finance, regulation and efficiency of farms

Prof. Bernardo Reynolds Pacheco de Carvalho
University of Lisbon, Portugal

1. Regulations, markets and economic efficiency in the context of sustainable development and food security

1.1. Introduction

Europe continues to be a "special space in the world" regarding achievements in human development. But this fact does not reduce the future challenges and responsibilities regarding their own population but also the overall (actual and future) impact in the rest of the world.

Food security, on nowadays definition, derives its importance from the traditional fight to achieve the satisfaction of basic needs, with guarantees of "freedom from hunger". The European Community has been very successful in the food system improvements over the last decades, and one of the referential aspects in the system has been its Common Agricultural Policy (CAP). Indeed, CAP is considered to be an important example of technical intervention linked with reasonable governance able to provide a set of measures and policies with reference and based in the market systems. Rules and norms, laws and regulatory systems overall have been crucial and do not substitute markets, they indeed have a complementary but essential role to make markets work better.

CAP policy is a global system with many objectives and goes beyond production concerns. The CAP policy recognizes the multi-functionality of the food systems and agricultural production objectives, but at the beginning was very much cantered in production increases given the lack of autonomy in Europe regarding food needs. However today, Europe and most of the industrialized countries are with food surplus and/or with food surplus capacity, which is very consistent with the structural model to be discussed [Carvalho 2013]. Overall the food system has been very efficient, mainly in the most developed countries, based on gains in productivity and also gains in efficiency in economic production, however questions on the sustainability and governance equations are now much more relevant than in the recent past.

Food policy, mainly as a public policy, was very successful and the regulatory efforts were able, in many different forms, to work well connected with markets. Many "regulations" can be seen as restrictions to production, but many

of them can also be seen as the major mean to provide markets the best conditions to perform well, under certain conditions and objectives. Markets have been always at the centre of the economic relations, and are dependent from the "institutional environment". Economic efficiency considerations have to consider at least three different aspects: production efficiency, consumption efficiency and governance/institutional efficiency. In many different situations, efficiency questions and analysis need to consider the existence of public goods, semi-public goods and a large set of situations were markets work poorly, such as the situations with significant externalities, scale/logistics problems, environmental conditions (natural and institutional), etc.

The example of CAP deserves attention at the world level for development purposes, mainly in regard to the enormous effort to support agriculture, trying to avoid unfair trade procedures, which occurred in many situations, and correcting unfair trade impacts. The multi-functionality recognition for agricultural production activities, the social needs and income distribution policies along with the decoupled support measures have been crucial to promote regional development, pursuing a lower negative impact in international terms (worldwide trade).

Global Food Supply, for the time being is not a problem, but hunger persists at very high levels (close to 1 billion people). Addressing possible solutions and understanding the phenomena is a very important research concern, exploring and identifying possible contributions from science. In this paper efficiency questions are raised dealing with production, consumption and governance, "vis a vis" the food system and looking at possible science contributions.

1.2. Referential concepts and hypothesis

Economic development studies and knowledge with its respective evolution has been made normally based on modelling economic systems and looking at comparisons among countries behaviour. Concepts and conceptual views and respective evolution are also very much related with the perception made about the real world system and respective evolution of thought, usually with a strong interaction with the most successful models. Hunger is an essential issue on every economic political structure aiming to achieve a sustainable development process, and belongs to the first set of objectives assumed by the United Nations (Millennium Development Goals) at the beginning of the XXI century (in the year 2000, UN declaration).

The world situation regarding food availability and respective human social organization have been related and interdependent in such a way which is

frequently not considered or even forgotten. However, since the beginning of the human civilization, food is always a basic concern for human decisions and able to shape many of the structures developed, starting with the urbanization process. Indeed the world has been affected to the 4th quarter of the XX century by lack of food, meaning a strong tension between food availability and population needs. With a systemic view and with an ecologic perspective the human population has been very much "controlled" through "food availability" mainly in the XX century when human population growth enters into an exponential growth phase (the world had entered in the XX century with around 1.5 billion people, and, at the end of the century, the world supported more than 6 billion people).

The FAO concerns (United Nations specialized Agency for Food and Agriculture) and mandate about feeding the world has been calling the attention to difference food crises. One of the most important crises was in 1973, where Malthus theories were revisited. Indeed at that time, Food Security concern received a new status and FAO first "gave the concept of food security a place in the international legal order…" (Boutros B. Ghali – Secretary General of the UN speech at FAO 1996 summit)[1]. Indeed since 1948 that security concerns have been on the Agenda to the UN, including food security. With the Universal Declaration of the Human Rights was affirmed that "Everyone has the right to a standard of living adequate for the wealth and well-being of himself and his family, including food…" Article 11 of the International Covenant on Economic, Social and Cultural Rights in 1966 call the attention to this fact when it affirmed the "right of everyone to be free from hunger". It is well recognized that "hunger" has been the essential issue in the international arena and that "food security" concept has been growing in substance with the time and development understanding that hunger and starvation, to be solved worldwide, will be necessary a multidisciplinary and multi-purpose objective and approach. However it is also important to recognize that many times food is a "political issue" used in many directions and supported in many different disciplines and groups of interest, including science.

With the above description and brief discussion, what today is most comprehensive issue on the agenda is "a new terminology for hunger elimination objectives" which received a very basic, but internationally recognized definition for "food security". Indeed, one of the important achievements of the WFS – World Food summit in 1996 was the approval of the definition of food security: "Food security exists when all people, at all times, have physical (so-

[1] Ghali speech at FAO summit (1996): «In 1973, when FAO first gave the concept of Food Security a place in the international legal order, we entered a new stage, for that made it possible a new universal level to define food policies, put in place strategies for action…».

cial) and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" [FAO, 1996, with the term "social" added in 2002]. Accordingly with Simon [2012] the WFP – world food program offers the following definition: "A condition that exists when all people, at all times, are free from hunger" [WFP 2009 in Simon 2012].

With the previous work of the author, for example in Carvalho [2014, 2013, 2011, and 1994][2] and the United Nations [1996] concepts and "official definition", food security means availability and access, in physical and economic terms, to enough and healthy food intake adequate to achieve a good nutritious status in a continuous and permanent way/path in time and space. The author considers five dimensions as the main set of factors to be considered in studying food security:

- Food Availability;
- Access to Food – including logistics, transformation, conservation, etc.;
- Utilization and Consumption – including all variables related to food quality and nutritious values, but also all variables related to food consumption choices, such as education, habits and cultural background, etc.;
- Stability of the previous variables considered (and also stability on risks and uncertainty factors);
- Vulnerability of the system (including the resistance and resilience to external and internal shocks to the system).

From this point of view, assuming a multi-factor and cross-section analysis to better address the food security equation, in the actual paper, it is necessary to explore some of the alternatives at hand that can be possible solutions to be implemented, resulting from previous research and applied development policies. The main hypotheses to be considered are the following:

1. There is a surplus capacity in food production (Europe and OECD countries) that should be directed to promote others capacity to produce and develop their food systems;
2. Regulations in the food systems should be seen as major elements to support markets (MK) functioning, and not constraints to MK forces;
3. Governance, in several forms, institutions and consumption economics, are other dimensions to be integrated in the global development model to understand the food system changes and dynamics (beyond supply growth);

[2] Carvalho in 1994 defines Food Security as: "Segurança Alimentar é obtida para uma determina da população referencial, quando é possível assegurar a todos os elementos dessapopulação o acesso em termos físicos e económicos a uma adequada alimentação" (Food security is achieved for a certain referential population when it is possible to guarantee to all members of that population the access, in physical and economic terms, to an adequate food intake).

4. Demand Constraints and structural changes in the economy should be addressed based on the "food balance equation";
5. The new "modern economy" based on non-tangible goods (virtual goods) and services, will also provide a new opportunity for the agribusiness activities;
6. Health concerns and quality of life objectives will promote alternatives for food production and food consumption systems, that will show the advantages of the "food chain analysis" perspective;
7. Value creation and sustainable development will be much more dependent on education and values coming from a well-informed/educated society (with ethical considerations being included);
8. Linkages of the food system with health and quality of life standards, will be crucial for development with sustainability considerations being on the top of the priorities;
9. Biological/Organic/Ecological food systems and the other food systems will evolve with a strong relationship between them, but certainly lower environmental impact is possible and desirable overall;
10. Institutional innovations, starting with strong governance and adequate food policy are needed at global but also at local level if hunger is to be reduced significantly.

Exploring all those hypothesis and statements and respective questions behind it in one paper is not feasible unless the purpose is to show the linkages among them and start a broad discussion of the fundamentals about sustainable development and food security issues, which is the case. However data analysis and the use of some proposed development models with the study of some real cases will provide the results necessary to derive important conclusions.

1.3. Data analysis and facts

The data presented will show the food supply per capita growth in several regions at global and local level and respective absolute levels (Table 1 and Table 2) in the last 50 years. With this information technological changes are put in evidence, but indirectly also some demand constraints, because trade amounts are relatively small in aggregated levels, and not significant in per capita change measures. Other information showing the interface among production and population derived from FAO made clear that the average availability of food per capita is above 2800 kcal/per day which is more than enough to feed the human population in the world in good conditions. However hunger persists, showing our food system failure, which is mostly an institutional failure (not supply

failure): The need for an integrated view, where regulations, markets and efficiency concerns can be part of a "system solution" (linking supply and demand, and demand and supply) is now clear.

Table 1. Food Supply per capita (kcal/capita/day) and total average growth rate in the period, per year

Specification	1961	1971	1981	1991	2001	2007	1961-2007 (Geom. Growth)
World	2200	2370	2512	2620	2722	2797	0,52
USA		3058	3230	3509	3683	3748	0,57
European Union	3000	3212	3279	3377	3457	3465	0,31
LDC's	1918	1968	1957	1966	2053	2136	0,26
South America	2304	2457	2611	2637	2781	2885	0,49
Asia	1804	2026	2233	2441	2590	2668	0,85
Africa	2029	2111	2236	2298	2366	2461	0,42

Source: FAOSTAT.

Table 1 incorporates in the last column the growth rate for the whole period which shows a very fast rate of growth on average per capita above 0.5% per year and per person in food availability.

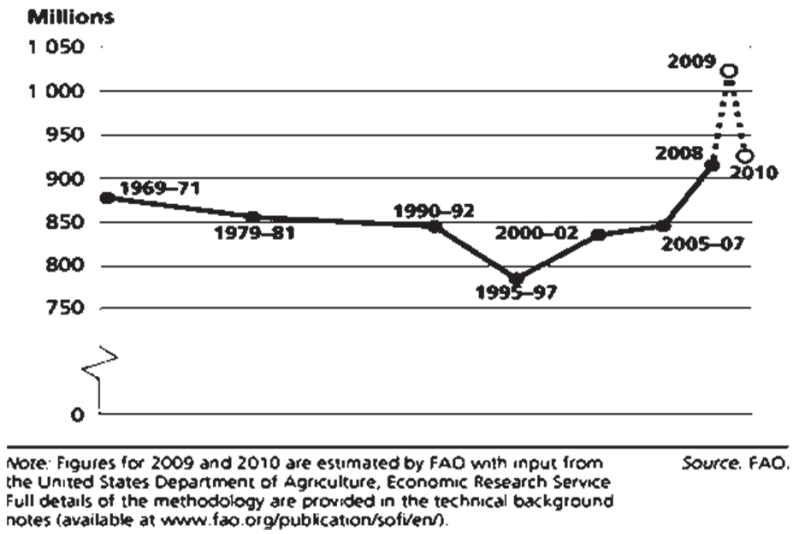
Table 2. Geometric Growth rate of Food Supply per capita (kcal/capita/day)

Specification	1961-1971	1971-1981	1981-1991	1991-2001	2001-2007
World	0,75	0,58	0,42	0,38	0,45
USA	0,60	0,55	0,83	0,49	0,29
European Union	0,65	0,21	0,30	0,23	0,04
LDC´s	0,26	0,04	-0,05	0,43	0,86
South America	0,65	0,61	0,10	0,53	0,62
Asia	1,16	0,98	0,89	0,60	0,49
Africa	0,39	0,58	0,28	0,29	0,66

Source: Faostat, 2010 data and authors calculations.

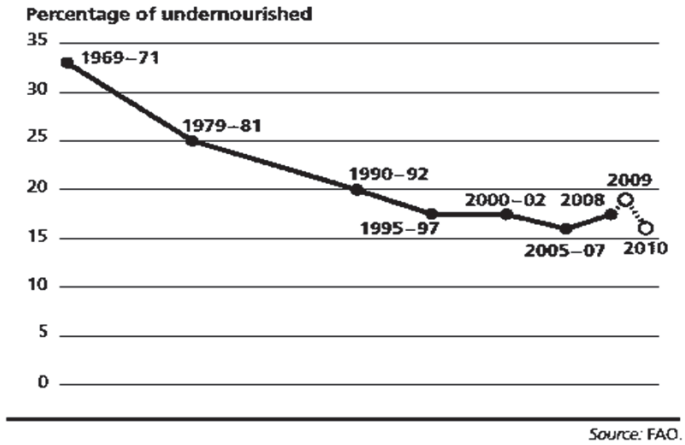
The figures below are quite elucidatory, but put in evidence that supply growth and even per capita growth availability of food did not solve the problem.

Figure 1. Number of undernourished people in LDC´



Source: FAO.

Figure 2. Proportion of undernourished people in LDC´s

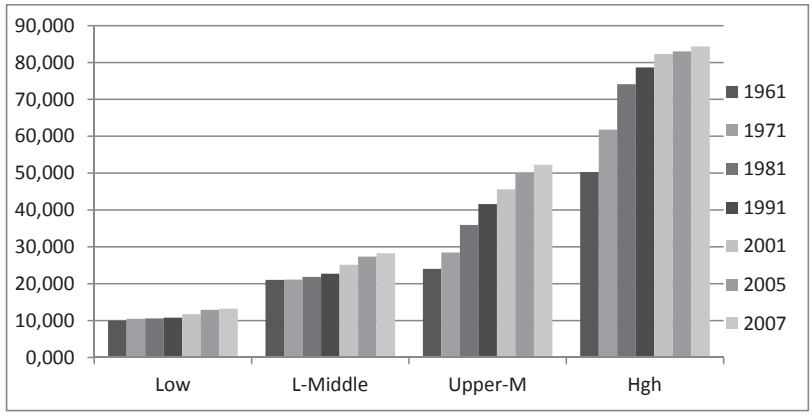


Source: FAO.

The number of people suffering from hunger is quite stable between 800 million and 1 billion in the last half of century, but with significant improvements in relative terms up to mid-nineties. That is, in last 10 to 20 years there were no relative improvements at all. However, when the analysis moves to food consumption in relation to certain type of foods, like cereals and meat and/or

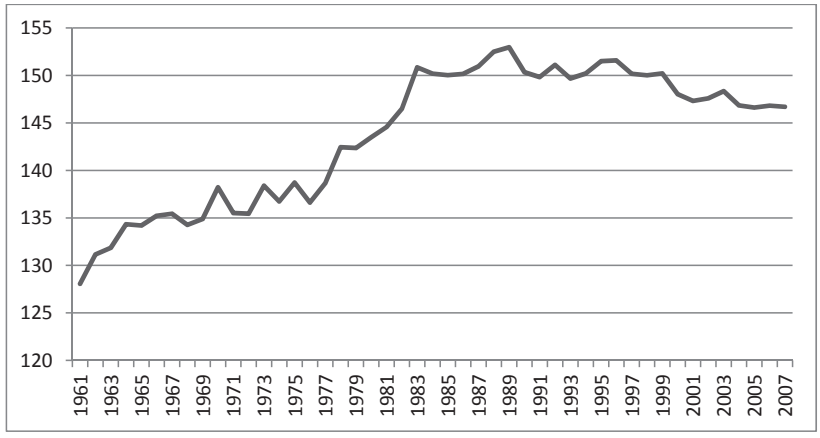
milk it is quite clear that Engel´s curve rational will appear showing that after a certain level of income no more consumption increase is expected per person. Adding to this the stabilization of people/population in many developed areas (no growth at all, or even decrease), such as in Europe, the conclusion will turn out to be that consumption levels will stabilize based on local markets.

Figure 3. Meat Supply (kg/capita/year) by country group



Source: FAOSTAT [2011] basic data and author´s elaboration.

Figure 4. World Food Supply of Cereals (kg/capita/yr)



Source: FAOSTAT, 2011 and author calculations (based on the 3 main cereals, wheat, rice and corn).

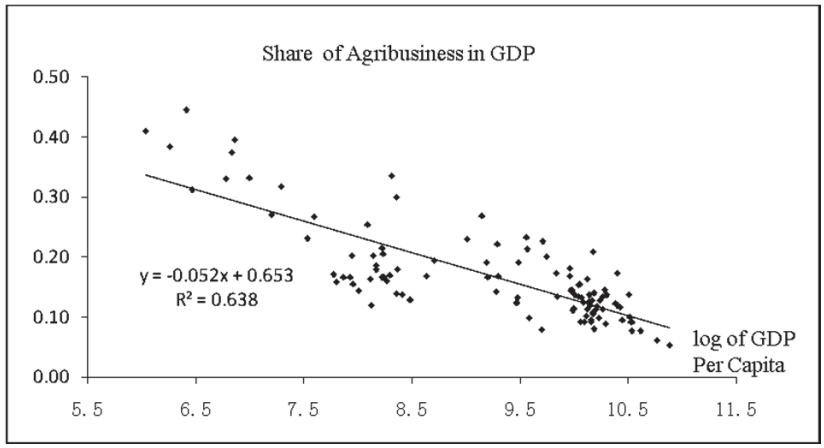
Figures 3 and 4 for meat and cereals show the consumption economic principle of marginal decreasing utility for any consumption good considered normal and/or basic good where permanent increases in income produce lower

and lower marginal utility for consumers. When the exercise is done comparing countries, at different income levels the decreasing marginal utility effect appears. Even at world level, fig. 4., the evidence shows that in per capita terms cereals consumption is no more increasing in per capita average. Again, demand constraints are quite clear with this type of results, showing decreasing marginal utility with income growth and higher levels of food consumption, or even tendency to decrease in basic foods, such as cereals, because diversity in food consumption is expected and desirable.

1.4. Observed structural changes

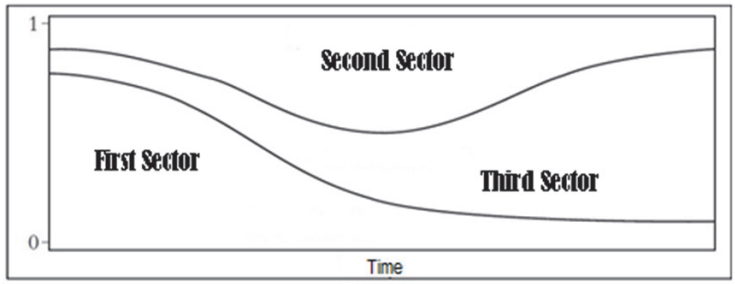
Changes over time are expected in the economy, desirable most of the time, and can be designed to occur in certain patterns which have been identified by the economic development people studying and trying to understand the process. For example, the agro-related activities are supposed to decrease its importance in the economy (at least apparently) when measured in terms of its contribution to the National Output (GNP – gross national product and GDP – gross domestic product). Sector shares importance in the economy and respective evolution of agro but also industry activities are decreasing, with relative importance of services growing. Figures 5 and 6 illustrate those structural changes over time.

Figure 5. Share of Agribusiness in GDP for OECD Countries in 2000



Source: https://www.iioa.org/conferences/19th/papers/files/442.pdf - pg. 6 in Fachinello, 2014.

Figure 6. Dominant sector structure in the development process: agriculture – industry and services (first, second and third sectors)



Source: [Kruger 2008, p.333].

The evidence shows the changes over time tendencies, keeping in mind that agro-related activities are seen here as the ones related with production and transformation, but not all the other activities co-related classified in services.

1.5. The need for development models: some proposals

To better understand changes and processes of change, the suggestion is to use development models already in use in the literature, and also address connected evolution of concepts, such as the one already discussed, Food Security concept.

The choice made is based on three different approaches, but all will be used for an integrated discussion. The referential models are the following:

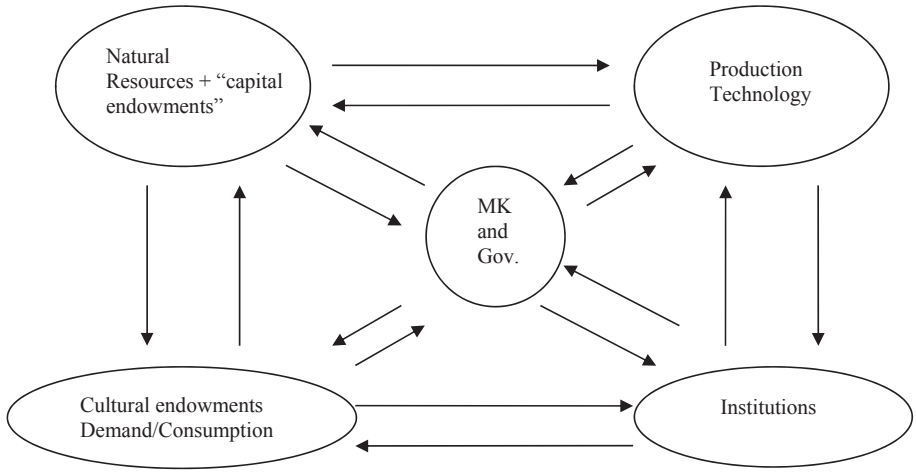
- World Food Security Equation (WFSE);
- Induced Change and Innovation Model (ICI model);
- Demand Constraints Rational.

The first one, is a structural development model, which states that countries move through 4 different phases (Mellor and Johnston, 1984 propose 3 stages, and the author in Carvalho et al 2011 points out to a 4 different stages), moving from a stage of equilibrium with nature (ecologic phase) to a long period of lack of food (with demand growing faster than supply of food, second phase), to a third shorter period, one of surplus, with supply growth greater than demand and, finally, to a new relative equilibrium phase with supply and demand matching behaviours (a full market with good institutional and policy environment).

The second one is based on the traditional Induced Innovation Model [Hayami and Ruttan, 1973 and 1985] and proposed derived model from Carvalho [2004] where the main rational is to assume that changes occur

accordingly with economic forces, where natural resources, technology, institutions and cultural background are all connected and where markets and governments play a determinant role.

Figure 7. Induced changes and innovation model



Source: Carvalho, B.P. de [2004] and author elaboration.

The third one links immediately with both previous models, where the discussion moves from a dual economy perspective, from supply and demand sides, to a more holistic view where production is "taking over demand" that is, we are considering that production is indeed any activity where, from more than on input, with a certain technology we obtain present of future utility (we obtain a product/output, tangible or not, that have utility, present or future utility). Carvalho [2014] discusses this perspective where demand (and/or production of utility) is indeed the goal of any activity. Demand (production of utility) is the last step in a "production chain" which means demand is driving the economic world every day, with more intensive presence, since the world production capacity in general is now moving far beyond the human capacity to consume. The implications of this situation are now putting much more responsibility on the human choices, education and value system of our society. What is the goal and what we want to consume for an improved quality of live and wellbeing. The agriculture sector, very much linked with services from nature and environment is now facing new challenges and opportunities. On food product markets, some new demands such as the one based on biological/organic/ecologic production systems will be growing, but quality of life will demand other

services, landscape dimension, tourism, health needs, cultural traditions and other areas derived from services from nature will also be necessary. All these dimensions are now being considered very much linked with the multi-functionality recognition from agricultural activities, where the social dimension cannot be forgotten. The occupation of free time, the creation of jobs and social cohesion are clear contribution today and will be even more important in the future.

1.6. Food system case study: Portugal example in Europe

Portugal example in Europe can serve to test how useful the discussed models can be to explain the recent evolution, "vis a vis" the expected structural changes, the European Union integration impact looking at the Induced Change model rational and combining perspectives, taking also into consideration the "demand constraints rational".

In economic terms it is well known that agricultural output share in the gross domestic national output is supposed to decrease, almost as fast as the economy can show high rates of economic general growth. However, what we can observe in the last decades is also a decrease in industrial share in the economy, with clear advantage for services.

Table 3. Sectors relevance – share of GDP (%)

PORTUGAL	IMP.SECTOR	% GDP						
		1954	1974		1995	2002	2011	Dif.2002-2011
1ªSERIE	AG+FISH+INDUST.	55	40,6		27,4			
2ªSERIE	AG+FISH+INDUST.				21,4	17,3	14,5	-2,8
				1ªSERIE	2ªSERIE			
	AGR+For	29	11,7	6	4,9	2,8	1,9	-0,9
	Fish							
	INDUSTRY	26	29	21,4	16,6	14,6	12,6	-2
	ENERGY	1,4	1,7	3,6	2,6	2,4	3,2	0,8

Source: BP and INE in Eugenio Rosa (2013).

The data in Table 3 is quite important in terms of showing changes over time and, depending on many assumptions, it is important to compare those changes with other countries to understand how different or similar those changes have been (patterns identification).

Table 4. Des-industrialization – % GDP of Industry + Energy sectors in selected countries in Europe

Specification	2000	2009	2010	2009-2000 Dif. %
EU	22,4	18,1	18,7	-4,3
Germany	25,3	22,4	23,8	-2,9
Portugal	20,4	16,8		-3,6
Ireland	34,1	26,4	25,9	-7,7
Spain	20,9	15,4	15,9	-5,5
France	17,8	12,5		-5,3
Greece	13,9	13,4	13,6	-0,5

Sorce: Eurostat in Eugenio Rosa [2013].

Table 4 allows comparisons but shows that industrial sector (+energy) is not increasing their respective share but indeed loosing importance in the economy in general. This can be seen also as expected, because consumption patterns are also changing, and Portugal behaved in similar terms than others.

From the consumption point of view, and looking into habits and cultural background, it is important to compare the country situation before looking into the specifics of the agri-business sector. It is well known that food consumption depends on income, but beyond a certain income level, consumption tends to stabilize or even to decrease in many food products, with more diversified diets.

Table 5. Average kcal available per person per day in European States – – 2007-2009

European Member States	Years		
	2007	2008	2009
>3700 kcal per person/day			
Austria	3816	3826	3800
Belgium	3736	3751	3721
>3500 e <3700 kcal per person/day			
Greece	3637	3656	3661
Luxemburg	3599	3592	3637
Italy	3628	3612	3627
Portugal	3582	3614	3617
Ireland	3564	3588	3617
Germany	3552	3537	3549
France	3520	3598	3531

Source: DGS – Direcção Geral de Saude [2013].

However, cultural habits/endowments, and natural resources are also important factors with impact in the production and consumption systems (interacting and inducing some behaviours which differ from others).

The data for other European countries is given in annex 1. Poland, for example is with 3392 calories per day per capita which is very close with the United Kingdom and other East European countries. The UK, for example, is not increasing in consumption in caloric terms for the period considered, and probably, for some other countries, no increases will be observed in the near future. However, above 3700 kilocalories only two countries achieved those levels, Austria and Belgium. Most countries will probably reach the maximum between 3500 and 3700 kilocalories, where Portugal, France, Germany, Italy and others already are.

Looking into Europe, it is well known the differences in food habits among countries, and indeed Portugal has, probably, one of the diets considered most favourable to good health practices. Recently, introducing a clear institutional innovation, UNESCO classification of "Intangible Cultural World Heritage" established the recognition of the Mediterranean Diet (2010-2013). Portugal is one of the countries recognized, belonging to the group. One of the characteristics defining the Mediterranean Diet is the high consumption of fruits and vegetables.

Table 6. Fruits and vegetables average quantities available per capita and per year

States of EU	Years		
	2007	2008	2009
>300 kg/year			
Greece	388,5	360,2	385,6
Portugal	291,2	279,7	313,1
Italy	300,0	284,1	312,4
Malta	307,4	311,6	305,6
>200 e <300 kg/year			
Luxemburg	283,0	291,2	277,3
Ireland	225,6	244,1	244,3
Denmark	208,9	210,5	235,4
Spain	236,5	247,6	231,8
Austria	245,8	259,9	228,6
Romania	209,5	229,2	226,6
Cyprus	230,4	205,4	225,0

Source: DGS – Direcção Geral de Saúde.

Table 6 provides evidence that geographic localization in the Mediterranean area also produces a usual impact in terms of higher consumption of fruits and vegetables. Greece, Portugal, Italy and Malta are the ones with higher consumption levels (more than 300 kg/year per capita). Countries like Poland and Germany are located in consumption terms below 200 kg/year per capita. Income is certainly important, but there are other variables which makes the impact much higher.

Looking into the specifics of the food balance equation for Portugal, which should be achieving a similar behaviour to other countries in Europe, belonging to the third or fourth phase, using Mellor and Johnston [1984] classification and/or Carvalho [2013] classification, where consumption does not improve for food globally, (that is, it is already not increasing in average with income growth, and there is no population growth) but where agriculture output is growing, the final result is also dependent from other variables, and in the last decades changing very much, dependent from European Common Agricultural Policy (CAP). Table 7 provides data, able to bring a new perspective about the country situation regarding autonomy and dependence/interdependency in food availability (GAA – grau de auto-abastecimento/degree of self-sufficiency in food availability).

Table 7. Per capita consumption and degree of food self-sufficiency in Portugal

Item	1980/1982		1990/1992		2000/2002		2006/2008	
	kg/year	GAA %	kg/year	GAA %	kg/year	GAA %	kg/year	GAA %
Cereais / Cereals	143,4	27,8	144,9	47	154	33,1	152	26,9
Trigo / Wheat	91,2	37,1	99,7	36,1	109	17,7	108	11,5
Arroz / Rice	20,7	63,1	23,2	59,35	25,3	52	25,3	53
Milho / Corn	12,9	16	12,5	47,2	11,9	43,2	10,6	29,2
Raizes +tub / Roots + tubers	139,8	94,2	154,4	64,8	103,7	57,8	91,7	58,7
Legumi.Secas / Dry leg.	3,8	80,4	6,2	49,2	4,1	16,2	4,3	10,01
Prod.Horticolas	85,7	148,3	70,1	178,8	95	157,9	114,8	166,4
Frutos / Fruits	61,5	100,1	103,6	88,4	128,7	72,7	120,8	74,6
Azeite / Olive oil	4	101,6	3,5	104	5,8	47,2	6,2	57,6
Vinho +derivados / Wine+ derived products			62,2	129,1	47,7	118,2	43,6	114,8
Carne+miudezas	51	99	69,9	88,3	91,7	78,9	94,9	69,6
C.de Bovino / Bov. Meat	12,9	96,2	16,7	76,8	16,3	60,4	18,5	52,2
C.de suíno / Suine Meat	12,6	100,7	20,4	86,7	31,4	70,6	32,8	51,3
C. de Aves / Chicken meat	16,3	100	20	101,3	30,7	96,7	31,5	93
Ovino+Caprino / Sheep+Goat meat	2,5	100	3,9	92,4	3,5	70,4	2,9	79,8

Source: Ministry of Agriculture.

Globally, what can be concluded, looking at the evolution in consumption per capita terms and looking also at the changes up to 1980-82, and after EU integration (1986), basically regarding consumption and dependency from outside, is the consumption growth up to 1990-92 and/or 2000/2002, with stabilization afterwards and/or slight decreases in levels of consumption, but a clear growth, regarding dependency from outside. Looking at the position, degree of autonomy in production/consumption, up to 1980-82 and/or 1990-92, (considered before EU) and afterwards in 2006-2008 (before food crises, and economic crises), considered after EU, can be summarized like that (Table 8).

Some obvious conclusions can be derived, starting with growth in dependency from outside, mainly from EU. The next question is to look at the sector behaviour in terms of growth and trade. What will be expected in a sound and wealthy dependency growth from outside, mainly from EU as a result of the EU integration, will be to have greater relevance from imports in particular goods with no comparative advantages, but also specialization and capacity to improve substantially the export capacity.

Table 8. Self-sufficient rates in Portugal, before and after EU integration, measured in % of local production in regard to consumption.
GAA% – degree of self-sufficiency

Specification	Before EU – GAA %	After EU – GAA%
Cereals	47	27
Wheat	37	11,5
Rice	63	53
Corn	47	29,2
Roots and Tubers	94,2	58,7
Hortic+Fruits	178,8	166,4
Bovine Meat	96,2	52,2
Swine Meat	100,7	51,3
Chicken Meat	100	93
Ovine+Goats	100	79,8
Milk	100	106,2
Fish	102,1	41,1

Source: Data from Table 7.

To try a quick answer to the above question, let´s look first to the global economy relationships, mainly the balance of trade, and after to the food sector behaviour.

Table 9 shows a relative short data trend, but enough to elucidate the main drivers of the economy. Portugal had a tremendous growth period up to 2000, the first 15 years of EU integration, with great infrastructural investments, but

with clear tendency for negative trade balance which achieved very high levels in 2000, but good growth rates in exports and imports. The recent crisis in regard to the balance of payments and debts, is now putting a strong pressure to the economy, forcing net trade balances which occurred for the first time in 2013 (after more or less 70 years of the country history – last time with net trade balance happen during the II World War in 1943).

Table 9. Portugal Trade Balance – millions of euros

Year	Exports		Imports		Trade Bal.
	Goods	Services	Goods	Services	Net Trade Balance
1996	19 322	6 077	26 897	5 002	-6 499
2000	27 209	9 830	43 641	7 622	-14 225
2013	47 653	20 564	54 733	10 639	2 845

Source: Banco de Portugal in PorData, 2013.

It is not the time and place to discuss the European crisis and Portugal reaction to it, but face the numbers and look to the contribution of the agricultural sector to the economy, especially in regard to the "dependency" equation which is clearly rising as expected with integration, but always forcing new systems equilibrium. In regard to food security dimension, food sector dependency and interaction within Europe and outside Europe, the concern goes beyond economics. There are concerns about national security, safety, risks and vulnerability among other dimensions. However, globally, and in some food systems the country is improving substantially.

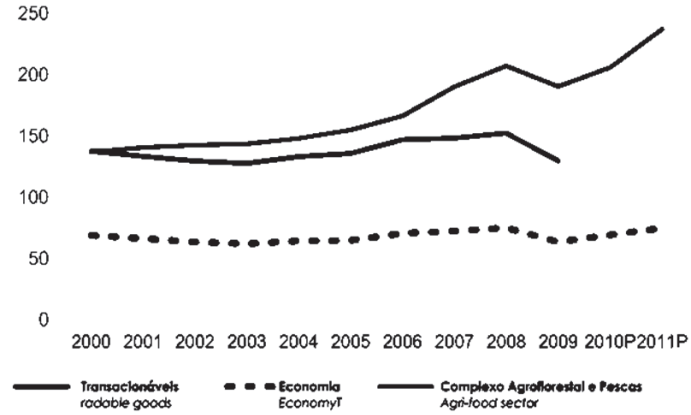
Table 10. Comparative growth rates for the Agroforestry and Fisheries Sector and the economy in 2000-2011 period (% in current prices)

Specification	Imports	Exports
Agriculture	4,0	10,9
Fisheries	4,3	6,1
Food, Beverage and Tobacco Industries	4,8	8,0
Forestry	-1,8	5,0
Forest Industries	1,6	4,4
Agri-food Sector	4,6	8,2
Forest Sector	1,1	4,4
Agroforestry and Fisheries Sector	3,8	6,2
Economy – Goods	2,3	4,0
Economy – Goods and Services	2,6	4,6

Source: GPP estimates from National Accounts, INE.

What can be seen is a very high growth rate in trade areas, imports and exports. However export growth is improving at higher rates for the agribusiness sectors in a very impressive way, allowing the conclusion that those activities are contributing strongly to improve the trade balance and balance of payments. Table 8 below also provided a confirmation of the success of the agribusiness sector in terms of openness to the international trade, showing the comparison with the overall economy but also to the tradable goods.

Figure 8. Degree of openness of the agri-food sector and tradable goods 2000-2011 (% current prices)



Source: GPP from National Accounts, INE.

With all those results, the next question will be how the agribusiness sector can be seen worldwide, and how significant it is in the economy for Portugal nowadays. The recent good results in growth, global output grow, after many years of relative low increases (anaemic behaviour), adding to some good leadership and crises in the economy globally, have made this sector very attractive and fashionable for the first time in many years. To put in evidence the relative importance of the country worldwide in terms of agribusiness activities, a selection of significant facts was identified, such as:

1. Cork sector – 1st in the World in Production and Transformation;
2. Tomato Industry – 4thin World Exports and 2nd in Europe Exports in 2012, after USA, China and Italy. "Top yields"– the highest average productivity in Europe and 3rd in the World;
3. Paper pulp: the 6th biggest producer in Europe and 13th in paper, pulp and board industry (Eurostat data in Aicep – Portugal – 2012);
4. Rice (production and consumption relevance (10% "top yields" – 1st in consumption per capita in Europe);

5. Corn (modern systems are achieving average yields at the highest levels in the world);
6. Horticulture and Fruits – The Case of Pear "Rocha" deserves reference (the 6th biggest producer in Europe for Pears);
7. Wine – traditionally among the top 10 biggest producers;
8. Olive oil – sector recovering form the past with new technology and great expansion in production and exports (for example achieving around 40% of all imports from Brazil). Relevance also on biological production alternatives in traditional systems.

Considering the relative position in Europe, and in the world, a small/medium country with 10 million people, such as Portugal, shows in agribusiness, an important presence in many sectors. Indeed, it is surprisingly bigger than expected and with strong internationalization (openness). The models discussed and respective rational provided opportunities to better understand changes and help to derive important conclusions for policy makers.

1.7. Main conclusions and new opportunities for Europe

Portugal was almost 100% self-sufficient for the most part of the food products, with clear deficit only in cereals before EU entry in 1986.

EU relations are complex (more dependent and/or interdependent today), but in the last years the agro system has been able to react in many sectors linked with technology changes and/or the international markets. The "openness" of the sector is impressive.

All the main important chains in the agribusiness are linked with technological changes and the international markets and/or do not face any demand constraints.

The country is very well adapted with good performances in crops and food systems where the eco-systems play their role in competitive terms (with high productivity rates in tropical, sub-tropical crops and/or from Mediterranean origin) and no demand constraints are "binding".

Consumption patterns and their changes are also very much in line with natural resource base and production activities (induced model test, for production and consumption). Europe is on the 4th phase in the Food Balance Equation – (WFSE model) with "no need " to improve global production.

The big challenges are around "Quality" and Efficiency (including lower environmental impact in production activities) creating value, but certainly mainly in new forms, markets and services.

Health, quality of life concerns and agribusiness/nature based activities are new "windows" for value creation.

The chain value approach, with special concern with the share value distribution along the chain, deserves a lot of attention and call for institutional innovation regarding markets functions and better governance. Transparency, information access (transaction costs) and negotiation power balances are key aspects to be taken into consideration.

New markets can be created, some of them in the European zone, with new products and "consumption forms", including in the traditional and non--differentiated products, mainly in the Eastern regions, where food consumption can still grow significantly.

This production growth should be well connected with consumption growth, but expansion should also be driven by quality and efficiency considerations, and value creation alternatives linked with services and the multi--functionality "deals" of the agriculture related activities (eco-tourism, quality of life, climate changes and environmental impacts and so on). A systems perspective is a necessary condition.

New Demands, new niche markets and health concerns will be crucial, such as the case of the "biological/organic/ecological" production systems.

The overcapacity in the food sector in OECD countries should be turned into forms of LDC's countries support (mainly tropical and/or sub-tropical countries) based on "knowledge" capacity transfer (not necessarily technological transfer which is not adapted, in most cases, to local conditions), with institutional innovation, giving priority to the ability of promoting sustainable development and empowerment of the food systems.

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Annex 1. Country list for Consumption in kilocalories per capita/day

>3000 e <3500 kcal per capita/day			
Romania	3442	3546	3487
Lithuania	3487	3514	3482
Hungary	3491	3495	3477
Malta	3444	3428	3438
United Kingdom	3453	3453	3432
Poland	3389	3363	3392
Denmark	3393	3370	3378
Czech Republic	3244	3466	3305
Slovenia	3221	3268	3275
Holland	3266	3277	3261
Finland	3229	3218	3240
Spain	3269	3232	3239
Estonia	3121	3131	3163
Sweden	3096	3123	3125
<3000 kcal per capita/day			
Latvia	2949	2993	2923
Slovakia	2838	2866	2881
Bulgaria	2775	2802	2791
Cyprus	2644	2665	2678

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2. Capitalisation of agricultural subsidies

2.1. Introduction

The authors of the paper aimed to confirm the thesis that the existing framework for analysing the capitalisation of subsidies by agricultural economists is a too narrow perspective. This phenomenon requires the multifaceted characterisation and evaluation of its impact on national and EU economies, as it is an important and significant side effect of interventionism in agriculture. A thorough review of the literature provided examples of the multichannel impact of subsidies not only on the functioning of agricultural holdings, but also the economy in a given country or region of the world (such as the European Union).

The capitalisation of direct payments and other subsidies is the process of their accumulation in the rates of lease rents, as well as in the value and prices of fixed assets. Agricultural land is an important component of the latter. Theoretical bases for the analyses of capitalisation of economic rent, introduced by D. Ricardo in 1815, explained that the current price of agricultural land depends on the present value of rent and its future projected value. It is worth mentioning that about 80% of studies on the capitalisation of agricultural subsidies have been carried out by US scientists so far. In turn, European studies include not many analyses which refer to the SAPS[3] as a capitalisation determinant. The SPS studies prevail, as this scheme is older and more popular (greater coverage).

However, when assessing the effects of agricultural subsidies, also other determinants of improving the economic situation of Polish agricultural holdings must be taken into account, namely: (1) economic climate in agriculture (profitability of agricultural production), and (2) increase in the efficiency of production and operation of holdings due to changes taking place in rural areas in Poland.

[3] The EU has two payment models: Single Payment Scheme (SPS) and Single Area Payment Scheme (SAPS). The Single Area Payment Scheme is applied exclusively in new Member States. The Single Payment Scheme is used in the EU-15 and two new Member States (Malta and Slovenia). This scheme has three payment models: historical, regional and mixed (hybrid).

Moreover, J.S. Zegar[4] noted that growing global demand for food, resulting from population growth and changes in eating habits, has a significant impact on demand for and prices of agricultural land.

2.2. Remuneration of the factors of production

The term "factor of production" appeared in connection with attempts to explain how various incomes are generated in society, and how they are distributed. *An Inquiry into the Nature and Causes of the Wealth of Nations*, by A. Smith (1723-1790), presents no clear view of the origin of wage, rent and profit. This paper includes two coexisting ways of explaining the phenomenon of value and two corresponding ways of explaining income from labour, land and capital. In accordance with the former, human labour is the sole source and measure of value; however, the entire product is its natural remuneration. Rent and profit appear to be deductions from the product of labour. In accordance with the latter, the value of a good is constituted by incomes of the factors of production: labour income, i.e. wage; land income, i.e. rent; and capital income, i.e. profit. This concept implies the thesis that each of the factors of production receives what it generates in the process of distribution: labour – wage, land – rent, and capital – profit.

The second aspect of the A. Smith's theory was developed by J.B. Say (1767-1832) in his theory of factors of production. David Ricardo (1772-1828), a follower of the A. Smith's theory, distinguished three basic social classes, each of which has its share in global income: landowners receive their rents, workers – wages, and capitalists – profits. A change in the theory of value and the theory of distribution started in the 1870s in a subjective-marginalist trend in economics. The founder of the neoclassical school – A. Marshall (1842-1924), changed the focus of value analysis from production costs to demand and consumption as value determinants. However, he based the theory of income distribution on the

[4] In accordance with J.St. Zegar, demand for agricultural products is expected to double over the next four decades (until 2050) due to an increase in demand for food (about 70%) and biofuels (30%). FAO analyses suggest that the growing demand for food is determined by three main factors: population growth of 2.1-2.3 billion by 2050, an increase in income in developing countries and a change of diet to increase the share of animal products. Going on a meat diet has even more impact than population growth [J.St. Zegar, *Kwestia bezpieczeństwa żywnościowego a ekonomia*, 9th Congress of Polish Economists, 2013]. In accordance with OECD experts, global production of bioethanol and biodiesel will almost double by 2021; however, Brazil, the United States and the European Union will be its main centres [OECD-FAO *Agricultural Outlook 2012*]. Biofuel is produced mainly from agricultural products. These forecasts increase interest in agricultural land and, accordingly, also determine its prices.

concept of marginal productivity of the factors of production. A US economist, J.B. Clark (1847-1938), in his 1899 *The Distribution of Wealth*, developed a theory of distribution. He made reference to the law of diminishing returns and widely used the concept of marginal productivity. Land value depends mainly on the value of its crops. The theory of marginal productivity by J.B. Clark was a decisive step towards determining the market valuation of the factors of production: land, labour and capital goods[5].

Land is the original and inexhaustible gift of nature and, at the same time, an essential factor of production in agriculture whose supply is fixed (rigid, highly inelastic). The price of such a factor is called rent or purely economic rent to determine income from land ownership. Rent occurs whenever the supply of (any) factor is rigid (inelastic). Economic rent is a special payment for using a resource or a factor of production, exceeding its opportunity cost. In contrast, pure economic rent is a payment for using a resource of production, whose opportunity cost is zero. The supply curve of a factor of production with only one application is vertical, i.e. perfectly inelastic. As the alternative cost of using a resource in accordance with its only application equals zero, monetary income derived from its use is considered pure profit or economic rent. The selling price of land, as opposed to the price of using it for a specified time, reflects the present value of its future economic rent. Landowners, selling their plots, at the same time lose their income received in the form of economic rent. Therefore, they shall oblige purchasers of land to pay an amount, which deposited in a bank will provide them with income of not less than the one received in the form of economic rent.

2.3. Interventionism in relation to the land market

Direct payments have been, and still are the most important instrument of agricultural support. They involved agricultural producers in the mechanisms of the financial market system, and consequently – also in its subsystems: deposits, loans, investments, insurance, and transactions. Farmers are no longer excluded from the financial market. They can generate financial income from investing their surplus funds, use subsidies to collateralise loans, benefit from them in a cheaper way, and also reduce their transaction costs due to the possibility of remote access to banks. What is more, financial institutions have

[5] The theory involves remunerating the factors of production according to their marginal productivity. It is based on the law of diminishing marginal returns, under the premises of perfect competition and perfect mobility of the factors of production. In this case, ground rent is the same as a share obtained by a capitalist for advancing his capital in non-agricultural production.

an indirect impact on improving the economic efficiency of holdings and, on the other hand, they themselves have a relatively stable base to refinance their activities. Thus, direct payments have a positive impact on the entire rural economic climate and economics. The level of direct payments received by Polish farmers increases annually in accordance with the principle of phasing in, which reached 100% in 2013. Direct payments associated with an area of land increase land prices and lease rent (capitalisation of payments). In many EU Member States (Luxembourg, Slovakia, Germany, England, France, the Netherlands, Italy), most of land is cultivated by lessees, rather than owners. In accordance with OECD estimates, owners of agricultural land may receive up to 90% of area payments due to higher lease rents (Table 1) and the price per hectare of land (Juxtaposition 1). However, producers of capital goods for agriculture and landowners receive most of support of the prices of agricultural products through the organisation of their markets.

Table 1. Impact of subsidies on rental rates in light of the review of the literature (based on the US agricultural land market)

Authors	Support type	Capitalisation rate (%)
S.H. Lence, A.K. Mishra (2003);	coupled support	71-90
B.K. Goodwin, A.K. Mishra, F. Ortalo-Magné (2005)	coupled support	29
B. Kirwan (2009)	decoupled support	25
B. Kirwan, M.J. Roberts (2010)	decoupled support	14-24
B.K. Goodwin, T. Serra, A.M. Featherstone (2011)	decoupled support	32-164
N.P. Hendricks, J.P. Janzen, K.C. Dhuyvetter (2012)	decoupled support	20-57
J.D. Kropp, J.G. Peckham (2012)	decoupled support	32

Source: P. Ciaian, J. Swinnen, D. Kancs, The impact of the 2013 CAP reform on land capitalisation, CEPS, Brussels 2014.

For comparison, the capitalisation of the SAPS payments in the European Union accounted for 19% of the rental rate as calculated by P. Ciaian and D. Kancs (2012), and 15-32% of rental value in accordance with K. Van Herck and L. Vranken (2013). As regards the SPS, these subsidies accounted for 6-10% of rent [J. Michałek, P. Ciaian and D. Kancs, 2013].

Subsidies are therefore an important additional stimulus to increase the prices of land and lease rates. Since 2002, the global agricultural land price index, developed by Savills, has increased from 100 to 511 points.

Table 2. Increase in agricultural land prices in selected countries in 2002-2010

Country	Percentage increase in prices (%)
Germany	70
USA	74
France	90
Denmark	119
Ireland	125
Canada	153
UK	210
New Zealand	262
Australia	300
Poland	361
Global average	411
Argentina	443
Brazil	568
Hungary	818
Romania	1817

Source: www.savills.pl (as of 16 March 2013).

In our region, it reached 758 points at that time. Since Poland's accession to the European Union (1 May 2004), agricultural land prices have increased by 300%, and in some areas – by even 400%. As regards Poland, agricultural land has been getting more expensive for over 20 years. It turns out that the price increase is a global trend and record prices were reported by Romania. The average price of agricultural land in private trade in Poland was PLN 26 thousand per hectare in late 2013. However, despite this increase, our agricultural land is still much cheaper than in the old countries of the Commonwealth (so-called EU-15) – over twice cheaper than in Germany, four times than in Belgium and Denmark, and over six times than in the Netherlands. Analysing the agricultural property market, we should keep in mind the factors affecting demand. The economic environment of this market, which has changed since Poland's accession to the EU, is one of them. It should be emphasised that not only growing demand for agricultural land has been revealed, but also interest in its lease has been increased. Demand for the lease of agricultural land is further stimulated by the possibility of using the EU subsidies by its lessee. Furthermore, more and more people consider the purchase of agricultural land, in order to resell it at a higher price, as a good capital investment.

Since the EU accession, the lease of land in Poland has leapt twice. However, the rates are still lower than in Western Europe[6]. The pace of the process of capitalisation of payments in lease rent depends on the effective period of lease agreements. The longer they are, the greater the inertia of rental rates. Based on the comparison of rental rates with the SAPS rates in 2008 and 2009 (share of rent in a SAPS amount per 1 hectare amounted to 84% and 77%, respectively), it can be concluded that the lease of agricultural land in Poland is among relatively cheap[7] forms of its use. Studies on the Polish land market were carried out by E. Laskowska (2011). Their results are presented in Table 3.

Table 3. Investment cap rate in the agricultural land market in 2005-2010 (as a ratio of average annual lease rent to the price of 1 ha of agricultural land)

Item	Annual values [%]:					
	2005	2006	2007	2008	2009	2010
Capital rate (private trade)	3,01	3,27	3,03	2,95	2,50	2,41
Capital rate (state-owned land)	2,49	2,43	4,85	3,53	1,87	3,02

Source: E. Laskowska, Inwestycje na rynku gruntów rolnych w Polsce, Roczniki Nauk Rolniczych, series G, Vol. 98, Issue 3, 2011.

It is worth mentioning that a further increase in demand also in the agricultural land market is expected. This will involve the abolition of restrictions on the purchase of properties by foreigners in Poland from 1 January 2016. A gradual reduction in the supply of land by earmarked for sale the Agricultural Property Agency boosts interest in its lease. Moreover, on 31 December 2013 expired Council Decision 2010/10/EC of 20 November 2009 on the granting of a State aid by the authorities of the Republic of Poland for the purchase of agricultural land between 1 January 2010 and 31 December 2013 (State aid for the purchase of agricultural land, including in the form of interest rate subsidies to bank loans, and aid in the form of payment of debts from the sale of a property owned by the Agricultural Property Stock of the State Treasury in instalments at a preferential interest rate of 2%). This situation made Polish farmers purchase land faster, in order to be able to exercise their preferences.

[6] M. Sikorska, T. Ciodyk, A. Zadura, T. Zagórski, B. Buks, *Rynek ziemi rolniczej. Stan i perspektywy*, IERiGŻ-PIB, Warsaw 2010.

[7] When calculating rent, a soil quality class and the tax district of a leased property are taken into account. Currently, the amount of lease rent is associated with the average selling price of land in a specific area. In the third quarter of 2013, the average amount of annual rent was 8.9 decitonnes/ha (about PLN 870 per hectare). The highest rents were in the following voivodeships: Dolnośląskie, Wielkopolskie and Warmińsko-Mazurskie; the lowest ones – in Podlaskie and Małopolskie (www.anr.gov.pl).

There is a new phenomenon among transnational corporations and investment funds which consists in taking over agricultural land, mainly, in Africa, but also in Central and Eastern Europe. In connection with the global financial crisis, which we have been facing since 2008, the EU Member States have taken actions that could result in imposing restrictions on both free land trade, and access to the agricultural land market by non-agricultural investors. The experience of Ireland shows that excessive liberalisation of trade in land makes its prices abstract, compared to the realities of profitable economic activity in agriculture. This situation resulted in creating a speculative mini-bubble and a banking crisis in the country. In turn, the concept of establishing a Lithuanian "land bank" was born due to the fact that the "invisible hand of the market" was of no help in solving the problem of set-aside land in the country. However, it seems that excessive intervention in the land market and the introduction of restrictions on land trade, as demonstrated by France (legal restrictions), lead to predatory pricing of land, which is no longer an important economic category promoting the modernisation and improvement of the area structure of agricultural holdings. Low land value is poor collateral for investment loans and, when selling such land, the amount obtained is not enough to launch non-agricultural activity.

2.4. Capitalisation of subsidies in the light of the review of the literature

J.E. Floyd (1965)[8] argued in his papers that support in the form of subsidies affects the prices of the factors of production and this impact is highly dependent on: elasticity of their supply, i.e. level of mobility in the economy; technology of agricultural production (i.e. in particular, the possibility of replacing a scarce factor of production with other, cheaper one); and a programme to control entering/leaving the sector (legal restrictions). Then, the Floyd's model was alluded to by: B.L. Gardner (1983); T.W. Hertel (1989, 1991); H.D. Leathers (1992); J. Dewbre (2001, 2002); OECD (2002, 2008); Guyomard H. (2004).

The impact of subsidies on agricultural production, expenditure allocation and income distribution has been, and still is comprehensively analysed in the literature. Literature studies show both a positive and negative impact of subsidies on the performance of agricultural holdings. However, the multi-directional (or multi-channel) nature of this impact is undeniable. The capitalisation of subsidies has attracted the most attention of, and has been studied best by the US scientists. However, also OECD experts carry out more and more studies in this

[8] J.E. Floyd, *The effects of farm price supports on the returns to land and labour in agriculture*, "Journal of Political Economy" 73(2), 1965.

respect. They reveal that changes in the amount of economic rent usually do not change the offered quantity of a good across the entire economy. Nevertheless, its level determines the allocation of land between different uses. In the long run, changes in resource prices result in: resource substitution and supply changes. The former involves replacing a more expensive resource with other, cheaper one. The latter consists in a change in demand for factors, which is caused by a change in production volume due to a change in its costs. It should be also noted that technological progress also affects demand for the factors of production. The elasticity of land supply and the elasticity of substitution of the factors of production are key determinants of land prices and the rates of lease rents. The method of implementation of policy is the third determinant of capitalisation (in accordance with the 2008 OECD Policy Evaluation Model)[9]. Hence, it can be concluded that the capitalisation of subsidies in the value of assets is a side effect of interventionism in agriculture, with a broader multichannel impact on the economy. Studies on the capitalisation of support have been, and still are varied both in place and time. The following literature may be consulted:

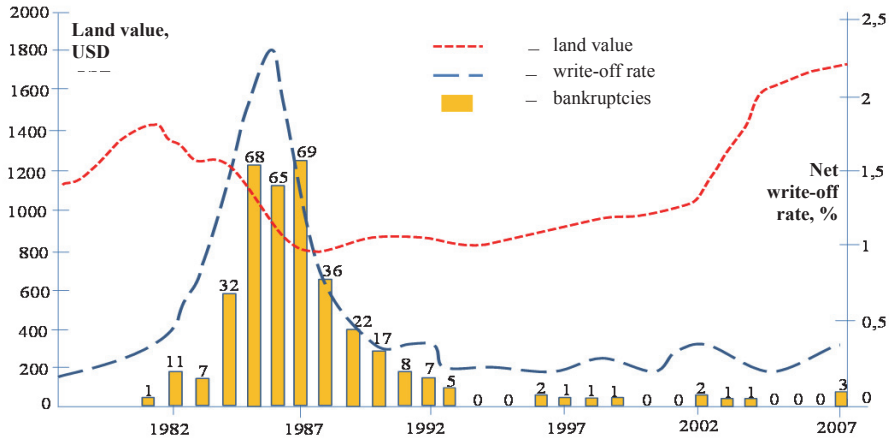
- S.H. Lence, A.K. Mishra (2003) – USA, 1996-2000;
- M. Patton, P. Kostov, S. McErlean, J. Moss (2008) – Ireland, before 2005;
- S. Kilian, J. Anton, K. Salhofer, N. Roder (2008) – Bavaria, 2005;
- G. Breustedt, H. Habermann (2011) – Germany, before 2004;
- P. Ciaian, D. Kancs (2012) – EU-12 (SAPS), after 2004;
- L. Latruffe, Ch.Le Mouël, L. Piet, P. Dupraz (2013) – France, 2008;
- K. Van Herck, L. Vranken (2013) – EU-12 (SAPS), after 2004.

In the light of these studies, it can be stated that the impact of subsidies on supply and demand for land was unclear. It was found, however, that there was a relationship between the SPS payment model used (regional, historical and hybrid), and the amount of lease rent and the price of land. Furthermore, decoupled support (decoupling) proved to be more capitalised in land prices (in accordance with the 2008 OECD PEM model). A review of studies on US agriculture by L. Latruffe and Ch.Le Mouël (2009) allowed to conclude that direct payments cause higher capitalisation in an increase of agricultural land values than subsidies on production and prices of agricultural products. It is worth noting that plans concerning future subsidy levels determined current demand for agricultural land. Capitalised direct payments were calculated by dividing their annual amounts, paid for a base area in a specific region, by the value of discount rate, which determines the time value of money. As a result, it was found

[9] *Agricultural Support, Farm Land Values and Sectoral Adjustment. The Implication for Policy Reform*, OECD 2008.

that the possibility of using direct support determines the value of a hectare of land in 12-40 per cent. The reduction or elimination of direct payments may significantly decrease agricultural land prices, thus causing a rapid fall in the value of fixed assets and the creditworthiness of farmers. This could even be described as a speculative bubble burst in the market. Figure 1 shows a situation where a drop in land prices (red line) was followed, with some delay (about 5 years), by an increase in the number of bank failures (orange bars). Due to the drop in land prices and thus the fall in the value of fixed assets, banks faced problems associated with non-performing loans. This, in turn, affected the entire US economy, including the state budget. This situation is comparable to the problem of subprime loans[10] from 2008.

Figure 1. Real land values (prices as of 2000), net write-off rate and agricultural bank failures in the United States in 1977-2008



Explanation:

$$\text{Net write-off rate} = \frac{\text{annual loan write-offs} - \text{recovered loan losses}}{\text{total loans before write-offs}}$$

Normally, the rate is 0.5-1%.

Source: Own elaboration based on: Briggeman C.B., Gunnderson A.M., Gloy A.B., The Financial Health of Agricultural Lenders, "American Journal of Agricultural Economics", vol. 91, no. 5, 2009.

[10] US lowest-rate mortgage loans.

The possible impact of subsidies on the willingness of farmers to use foreign capital was confirmed in the studies by P. Ciaian, J. Pokrivcak and K. Szegenyova[11] (2012). Table 4 clearly shows that this impact is not neutral.

Table 4. Summary of empirical studies concerning the impact of subsidies on the use of bank loans

Item	Panel models with fixed effects		GMM estimation	
	long-term	short-term	long-term	short-term
Decoupled subsidies				
Small holdings	Negative impact	Positive impact	Positive impact	Neutral
Large holdings	Positive impact	Negative impact	Positive impact	Neutral
Coupled subsidies				
Small holdings	Negative impact	Neutral	Nonlinear positive	Nonlinear positive
Large holdings	Positive impact	Neutral	Nonlinear positive	Nonlinear positive

Source: P. Ciaian, J. Pokrivcak, K. Szegenyova, "Do agricultural subsidies crowd out or stimulate rural credit market institutions?..., op. cit.

Large holdings use subsidies as an alternative to, or collateral for long-term loans, while small ones use them to obtain short-term working capital loans or as an alternative.

Studies carried out by K. Van Herck and L. Vranken (2013)[12], this time based on the EU-12 data, also confirmed the occurrence of capitalisation, i.e.:

- up to EUR 25 cents for every euro of direct payments capitalised in lease rent;
- an increase in land prices due to subsidies reduced the impact of subsidies on agricultural income;
- an increase in rents had a direct negative impact on the transfer of land and an indirect negative impact on the restructuring of holdings and structural changes in the agricultural sector (providing a hindrance to new people willing to enter agricultural production).

[11] P. Ciaian, J. Pokrivcak, K. Szegenyova, *Do agricultural subsidies crowd out or stimulate rural credit market institutions? The case of EU Common Agricultural Policy*, "European Integration online Papers", vol. 16, article 15, http://eiop.or.at/eiop/texte/2012-015a.htm.
[12] K. Van Herck, L. Vranken, *Direct Payments and Land Rents: Evidence from New Member States*, "Factor Markets Working Paper", No. 62, August 2013.

The capitalisation of direct payments occurs with varying intensity, depending on the model of support used. The highest level of capitalisation is typical of the EU regional model. This is a consequence of no diversity in the unit value of payment entitlements at the regional level. It makes you know in advance what a revenue stream in the form of payment may be generated by a unit of, and area located in a specific region. Also decoupled support is characterised by a higher degree of capitalisation. The higher the degree of capitalisation, the lower the effectiveness of direct payments, as a means of income support for agricultural land users.

Nowadays, expected future rents are a key component of land value (definition by D. Ricardo still applies). Agricultural land prices can be adequately approximated by the sum of the discount future rates of lease rent. The NPV (Net Present Value) method is helpful in explaining about 40% of land price value. Based on the NPV approach, the following calculation formula is used:

$$L_t = \sum_{i=0}^{\infty} \frac{E(R_{t+i})}{(1+r_{t+1})(1+r_{t+2})...(1+r_{t+i})} .$$

This equation can be shortened as follows:

$$L_t = \frac{1}{1+r} \sum_{i=0}^{\infty} \frac{E(R_{t+i})}{(1+r)^i}$$

or:

$$L_t = \frac{R^*}{r}$$

where:
L_t – equation for asset prices over time t,
$E(R_{t+1})$ – expected value of future net returns (profitability) from land,
R^* – real net returns from agricultural land,
r – discount rate.

However, estimating the value of rent based on the above formulae carries some risk. It is related to uncertainty surrounding future discount rates. It is about their potential abrupt changes due to new economic crises.

2.5. Capitalisation in relation to agricultural sustainability

The concept of a hedonic pricing model, which is based on the premise that heterogeneous goods can be represented as the aggregate of their features (characteristics), is another way to estimate rental rates. More formally, hedonic models take the form of econometric models (usually, single-equation models nonlinear in their variables), in which price is the dependent variable and product characteristics – believed to have a significant impact on product price – are the explanatory variables. Therefore, the price of a heterogeneous good is the sum of the valuations of its individual characteristics described by the explanatory variables and the factors reflected in a random component[13].

Environmental values affect agricultural land prices, as confirmed by studies on the example of the state of Wyoming, based on the following hedonic model[14]:

$$y_i = \sum_{k=1}^{K} \beta_k^{ag} X_{k,i}^{ag} + \sum_{j=1}^{J} \beta_j^{amenity} X_{j,i}^{amenity} + U_i$$

where:

y_i – price of the plot concerned i,

β_k^{ag}, K – parameters related to production variables for the entire sector (national statistics),

$X_{k,i}^{ag}, K$ – parameters characterising production variables for the plot concerned i,

amenity – meaning valuable properties,

other symbols relate to amenities (particularly valuable properties) at the plot concerned i.

Remote agricultural areas, which include wildlife habitat, picturesque views and angling opportunities, have higher prices per hectare in Wyoming than those whose landscape is dominated by agricultural production. Geographic Information System (GIS) data are used to measure recreational and scenic

[13] F. Waugh, who studied the impact of size, shape, colour and maturity of vegetables on their price in 1928-1929, and A. Court, who published a paper on dependence of car prices on such features as engine type, car weight or window area (Berndt, 1991) in 1939, are regarded as the pioneers of the hedonic analysis of prices of goods. However, the dynamic development of the theory of price indices and the econometric theory of hedonic models is reflected in the rich literature of an empirical nature; Malpezzi (2002) presents a review of applications of hedonic models and the latest trends in their development.

[14] J.R. Wasson, D.M. McLeod, Ch.T. Bastian, B.S. Rashford, *The effects of environmental amenities on agricultural land values,* Land Economic, 89(3), August 2013.

amenities associated with rural land (Tables 5-6). Proximity to forests, parks, lakes, rivers, hills and clean unpolluted air are the variables contained in different classes of attributes of the plot concerned for the purposes of its valuation (using a hedonic model). The sampled land prices are explained by the level of both environmental amenities and production attributes. "Recreational" variables (scenic view, angling opportunity and distance to urban areas) proved to be statistically significant. This analysis allows a better estimate of environmental amenity values of such a plot. The hedonic technique is based on the premise that goods traded in the market are made up of different sets of attributes or characteristics. Wyoming can be considered as having large and very diverse rural areas, where the agricultural land market can be well analysed. It is a typical agricultural state engaged in animal feed production and holding a considerable share in sugar beet cultivation. Agricultural land values are dependent on, e.g. the following features: productivity, distance to markets and amenities, such as irrigation, infrastructure, etc.

Table 5. Disadvantages due to the lack of environmental amenities – dollar/acre (hedonic model)

Region	Land cover	Location	Wildlife
West	-58,06	-43,77	-28,92
Central	-38,09	-56,90	-13,06
East	-20,80	-114,58	-4,84
Country	-38,09	-71,75	-15,16

Source: J.R. Wasson, D.M. McLeod, Ch.T. Bastian, B.S. Rashford, The effects of environmental amenities on agricultural land values, Land Economic, 89(3), August 2013.

Table 6. Share of selected amenities in the total estimated land value

Region	Environmental amenities (%)
West	56,20
Central	8,20
East	5,57
Country	30,94

Source: As above.

The conducted studies revealed that environmental amenities accounted for 5-60 per cent of plot value.

2.6. Subsidies in the process of value creation in agriculture

The impact of subsidies and their capitalisation are also reflected in the economic indices of holdings. Analysing their financial performance based on the Value Creation Index (VCI), allows more precise insight into this impact. This index is a ratio of return on equity (ROE) and the cost of its acquisition (K_E):

$$VCI = \frac{ROE}{K_E}.$$

Higher return on equity than its cost is the expected value of this ratio. Depending on the VCI value, an enterprise may experience three situations:

- VCI > 1 – value creation for its owner and his enrichment – capitalisation;
- VCI < 1 – generated value is consumed and its owner suffers impoverishment – in this case, we can observe a depreciation process;
- VCI = 1 – no changes in value creation for its owner.

To illustrate this phenomenon in practice Tables 7-8 present the VCI values for large-scale enterprises.

Table 7. The Value Creation Index and subsidy rate by the type of agricultural production

Type of agricultural production	Years	Value creation index*	Subsidy rate (%)**
plant	2012	2,56	7,76
	2011	1,96	8,69
animal	2012	2,03	3,89
	2011	1,83	5,01
mixed	2012	1,73	6,65
	2011	2,01	7,37

* – unitless value; ** – quotient of the sum of subsidies and revenues in total.
Source: "Ranking 300".

Promoting crop production, the CAP provides it with more support (higher subsidy rate). Higher subsidies increase the VCI values, i.e. asset and wealth creation for owners.

Table 8. The Value Creation Index and subsidy rate by legal and ownership forms

Ownership forms	Years	Value creation index	Subsidy rate (%)
Purchased	2012	2,82	8,25
	2011	2,53	10,32
Leased	2012	3,30	8,48
	2011	2,94	11,84
State-owned companies	2012	1,06	10,17
	2011	1,23	12,10
Agricultural Production Cooperative	2012	1,83	9,69
	2011	1,62	11,70

Source and marks: As above.

Purchased and leased holdings are market-oriented entities enjoying similar subsidy rate and higher VCI value. In their case, very large capitalisation and enrichment of their owners were observed. State-owned companies (Agricultural Property Agency) and the Agricultural Production Cooperative received more subsidies, but their VCI value was lower. This is due to the fact that these entities have different objectives and functions (biological progress, greater focus on environmental protection).

2.7. Summary and conclusions

Previous papers and studies on the channels of subsidy impact on the functioning of holdings regarded seeking individual relationships. However, none of the papers addressed the effects of multiple channels simultaneously. There are several reasons for this. First, the channels of impact may interact in opposite directions and addressing them together requires taking into consideration that these relationships may abolish each other. Furthermore, analysing annual data and estimating panel models may lead to different conclusions. Sometimes, the capitalisation of support can be observed only after aggregation of indices characterising regions.

In the light of the literature, the increasing dependence of holdings on subsidies positively affected their liquidity, solvency and investment activities. This means that the financial capacity of holdings improves and they can consider more ambitious restructuring, adaptation and development strategies. What is more, they can deal with various types of risks easier. Therefore, what becomes evident is the impact of wealth and collateral effects on uncertainty and

risk, willingness to remain in agriculture and the degree of alleviating credit constraints become evident.

Literature studies also allowed to indicate adverse effects of subsidising agricultural holdings:

1) Support programmes designed to increase the welfare of farmers may be capitalised in asset values, which is negatively reflected in the cost structure;
2) They limit mobility of the factors of production (land, labour and capital), hinder structural changes in agriculture and the optimal allocation of resources, thereby potentially further aggravating capitalisation;
3) Capitalisation of support in asset prices is a major source of inefficiency of transfers to agriculture.

It is worth noting that subsidies affect the market of agricultural production factors, but they must also be analysed in the context of changes in the value of agricultural assets.

In summary, the capitalisation of agricultural subsidies is a fact. Its sources, nature, intensity and consequences are, at the same time, conditioned in many ways. In some circumstances, however, we can observe its opposite – recapitalisation. Traditional agricultural and economic policy seeks to resist it. However, capitalisation itself only partly explains the volatility of prices and the value of agricultural assets.

The model of sustainability and multifunctionality of agriculture, based mainly on subsidies, can strengthen the existing logic and consequences of their capitalisation. With no methodological progress in the internalisation of externalities and the allocation of public goods produced in agriculture, and with no integrated and sustainable instruments of agri-environmental policy and its allocative and redistributive objectives, no change in correlation between subsidies and their capitalisation in land values and tangible fixed assets, and in the rates of lease rents, should be expected.

The capitalisation of agricultural subsidies fits perfectly in the current model of capitalism, which requires constant capital creation to facilitate growth, development, personal enrichment and improvement of the general welfare. This logic, however, results in constant crises, imbalances and accumulation of inequalities in the area of distribution. Accordingly, real, financial and regulatory fluctuations affect agriculture, but the capitalisation of agricultural subsidies may also, in return, make its contribution to the overall changeability of basic economic categories.

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3. Changes in the number of farms with the competitive ability run by natural persons

3.1. Introduction

The operation of economic entities (enterprises, companies, agricultural holdings) in the market and competitive relationships are inherent. These relationships include final products appearing in the market and the factors of production used to manufacture them [Frohbert 2000, Woś 2003].

J. Kulawik [Kulawik 2007] quotes the Freebairn's definition of competitiveness that deserves to be quoted in full. Competitiveness is the ability to "...supply goods and services in the location and the time they are sought by buyers, at prices that are as good as or better than those of other potential suppliers, provided that sales revenues cover at least the opportunity cost of returns on resources employed". It applies to own and borrowed resources.

The term "competitiveness" is close to "competitive capacity". The latter applies to entities that permanently achieve an economic surplus, which proves their both strong and sustainable market position, rather than to those who, for various reasons, are competitive only temporarily. Therefore, competitive capacity is the ability of economic entities to gain and maintain sustainable local, regional, national or even international market shares in terms of access to these markets. The competitive capacity of entities is primarily reflected by a large economic surplus and investments. The former proves their strong economic position and indicates their current market share. In the case of small entities, which are mostly agricultural holdings, large economic surpluses determine the standard of living of agricultural producers and their families, as well as opportunities to finance (at least partially) investments from own funds. However, executed investments indicate an ability and willingness to adapt to changing environment, which is a crucial prerequisite for maintaining competitive capacity in the long run. Furthermore, it should be stated that investing involves risk or uncertainty.

It should be emphasised that competitive capacity once gained does not last forever. On the contrary, agricultural holdings must constantly pursue it, increasing their resources of the material factors of production, adjusting production direction (structure), substituting inputs of more expensive resources and factors of production with cheaper ones, improving the quality of management work, etc. The market "punishes" such omissions with no successors, which necessitates leasing or selling holdings, and in extreme cases, even declaring bankruptcy. This observation is confirmed by Józwiak and Mirkowska [Józwiak and Mirkowska 2004], who inform of the entire groups of holdings, which disappeared in Austria, Germany and Denmark in 1997-2001. Out of 68 groups classified by type of farming and economic size, about 16% of them, mostly belonging to the size class of 8-40 ESU[15], disappeared[16] in the countries concerned during the analysed period. However, they were replaced by 6% of new ones, all with holdings belonging to the size class of at least 40 ESU.

Competitive capacity or its lack is of particular importance also in Poland. In 2002-2010, the total number of farms decreased by 24.3%. An example may be that imports of pork, live pigs and piglets have grown so much in our country since the accession that Poland has become a significant net importer of livestock, meat and pigmeat preparations since 2008 [Małkowski, Rycombel and Zawadzka 2012]. Therefore, the competitiveness of agricultural holdings should be considered with more attention than before. This study is to focus on the determination of the number of agricultural holdings in Poland, which were distinguished by competitive capacity after 2004, compared to the pre-accession period. The aforesaid applies only to agricultural holdings possessed by natural persons.

3.2. Situation in year 1999

The competitiveness of domestic agricultural holdings started to be considered in our country as preparations for Poland's accession to the European Union began. Persons and state institutions responsible for the situation of agriculture expressed their concern over the degree of development of agricultural holdings in Poland, compared to those of the former EU-15. One of the first studies on this subject [Józwiak 2003] was, therefore, to answer whether Polish agricultural holdings have any advantage over EU holdings, which would give hope that at least part of them will still operate after 2004. However, the study at

[15] Agricultural holdings in these countries belonged to the size class of at least 8 ESU.
[16] The term "disappearance of groups of agricultural holdings" used in the cited study indicates that the number of holdings in a specific group decreased to the extent that the FADN system ceased to monitor their economic condition.

issue did not provide the number of holdings distinguished by competitive capacity, but it can be estimated on its basis.

Information on Polish agricultural holdings comes from IAFE agricultural accounting results[17], while on those in EU Member States – from FADN monitoring results. On this basis, the necessary characteristics of groups of Polish holdings were determined, compared to the same characteristics of analogous groups of agricultural holdings from all Member States of the former EU-15. These groups are classified by type of farming and economic size expressed in ESU. Therefore, values characteristic of e.g. Polish cereal holdings belonging to the size class of 8-16 ESU were compared to the average characteristics of an analogous group of holdings from all then EU Member States. However, available Polish data limited the scope of assessment. Earned income and the type of reproduction of fixed assets could only be compared based on 1999 materials, because there were no other materials collected and processed using the same method. Moreover, assessment did not involve holdings belonging to the size class of up to 1 ESU and about 40% of larger ones [Accounting results... 1999]. In fact, there were types not represented in studies (specialist horticulture holdings), other included less than 10 holdings[18] (specialist dairy cow holdings) and other types did not have the required number of holdings (over ten) in certain size classes.

Therefore, it was found that net income per man-work unit[19] earned by Polish specialist permanent crop farms belonging to the size class of 1-3.99 and 4-7.99 ESU and specialist cereal holdings belonging to the size class of 16-99.99 ESU was equal or greater than in the case of EU holdings, as well as that they were aimed at extended reproduction of fixed assets. A total of 1.3% of the analysed sample conformed to the characteristics. On this basis, the number of holdings with competitive ability in the country was estimated at about 25 thousand. If this number was increased in the same proportion by 40% of holdings that could not be analysed due to lack of data, we would obtain 41.7 thousand (2.2% of the total) domestic farms with an area of over 1 ha of agricultural land, which were possessed by natural persons and distinguished by competitive capacity in 1999.

It is important to point out that these findings should be treated as indicative, because:

- they were prepared based on annual materials, and in a year worse in terms of earned income than other years before the accession. So-called entrepre-

[17] The sample involved only agricultural holdings possessed by natural persons.
[18] In such cases, they could not be published due to statistical confidentiality.
[19] The labour input of a farmer and his family members at the possessed holding.

neurial income[20] (agricultural income of farms possessed by natural persons and profits of holdings possessed by legal persons) calculated at constant prices was higher in 1998 and 2000-2003 by an average of over 14.3% than in 1999;

- the 1999 sample included only 1223 holdings [Accounting results... 1999], which makes it ten times smaller than the one monitored by the Polish FADN from 2004 onwards. The 1999 group of Polish holdings was also not a random sample;
- comparing the competitive capacity of holdings in countries at different latitudes is pointless, as the climate is different. In Poland, for example, you cannot grow citrus fruit, olives or rice, contrary to Southern EU Member States. Polish holdings should therefore be compared with holdings from countries of similar latitude;
- comparing income per unit of work of a farmer and his family in Poland and other EU Member States has no reason. So-calculated income earned by domestic holdings does not need to be higher than in other countries and it is enough if it reaches the parity level in the country;
- small holdings (belonging to the size class of 1-3.99 and 4-7.99 ESU) in "old" EU Member States (EU-15) – as previously mentioned – were declining and disappearing groups.

3.3. Situation in years 2006-2008

Period of preparation for accession and most of all Poland's accession to the European Union have significantly improved economic conditions in domestic agriculture, which probably influenced the number of farms with competitive ability. Therefore, the competitive capacity of different groups of agricultural holdings possessed by natural persons was further assessed in 2010 [Jagła and Józwiak 2010]. The scope of the assessment was 2006-2008. Empirical data came from Polish FADN monitoring results. Holdings were divided into groups according to their size measured in ESU.

Unlike in 1999, income earned as a result of work input of a farmer and his family members at the possessed holding[21] was assessed. For this purpose,

[20] Calculations were performed using the results of the economic accounts for agriculture (EAA), developed by the Institute of Agricultural and Food Economics – National Research Institute for the purposes of the European Commission in Brussels.

[21] For the purpose of this study, the term "possessed" is understood as a synonym for "used". A reference was made to the Polish Civil Code, which distinguishes between "autonomous possessors", i.e. owners of holdings they use, and "dependent possessors" who use holdings

the term "remuneration" of work input of farmers and their family members at possessed holdings was used, which was calculated as the gross income of a family agricultural holding (agricultural holding gross income) minus farmer's own funds invested in such a holding. Subsequently, the amount of "remuneration" was converted per unit of work input, i.e. per person working full-time.

Table 1 reveals that only agricultural holdings belonging to the size class of at least 16 ESU had competitive ability in 2006-2008. They were characterised by the "remuneration" of work input above the parity level and extended reproduction of fixed assets. However, those belonging to the size class of 8-6 ESU achieved the "remuneration" of work input below the parity level, although they were characterised by extended reproduction of fixed assets. Thus, they were slightly below the level of holdings with competitive ability.

Table 1. Number and share of farms possessed by natural persons by size measured in ESU and their brief characteristics in 2006-2008

Size of farms (ESU)	Number of active farms[a] ('000)	Structure of active farms[a] (%)	Assessment of the remuneration of work input[c] (parity remuneration =100)	Ratio of reproduction of fixed assets[d]
do 2	1623,7	67,9	.	.
2-4	299,6	12,5	65,0	32,0
4-8	221,3	9,3	65,1	61,0
8-16	146,1	6,2	94,3	110,6
16 and more	96,5	4,0	294,7	224,7

a. Agricultural holdings – CSO data of 2007.
b. Figures of 2006 based on Polish FADN monitoring results.
c. Ratio of the gross income of an agricultural holding minus farmer's own funds invested in such a holding per unit of work input of a farmer and his family at the holding he runs to national average work. Figures come from Polish FADN monitoring results and official statistics.
d. Ratio of gross investment to depreciation.

Source: Own calculations mainly based on Polish FADN monitoring results and the 2007 partial agricultural census.

However, figures in Table 1 on the number of farms distinguished by their competitive capacity were slightly excessive. A more detailed analysis revealed that certain holdings belonging to the size class of at least 16 ESU achieved less

not owned by them. Of course, there are also intermediate solutions when farmers are both autonomous and dependent possessors.

favourable results. VRS (variable return to scale) indices, determined for each of the analysed holdings using the DEA method in an input-oriented variant, were used to assess the level of production effectiveness, which made it possible to assess input reduction with the same level of effects within individual size groups. The study assumed that the maximum value of VRS indices is 0.95-1 due to the impact of varied production conditions in agriculture, on which the possessor of an agricultural holding has no influence. However, profit (OZ) was estimated by deducting income generated by holdings by the price of own material factors of agricultural producers (labour, land and capital). The rates of this price were set equal to the market price of the borrowed factors of production.

Based on the above, a subgroup of leading farms (VRS≥0.95 and OZ>0), using the available factors of production to the best advantage, and a subgroup of holdings with development potential (VRS<0.95 and OZ>0), which had opportunities to improve their situation, were separated from the size group of at least 16 ESU. The performed calculations indicate that about 80% of holdings from this size group had a firm basis for operation. Therefore, Poland had about 77 thousand holdings distinguished by competitive capacity in 2006-2008, rather than 96-97 thousand.

3.4. Situation in years 2005-2012

A panel of 5387 holdings, running continuously agricultural accountancy in 2005-2012, was separated from holdings monitored by the Polish FADN.

Under the panel, they were divided into subgroups based on their management profit and net investments. The former was calculated as the difference of income generated by a family agricultural holding and the prices of own factors of production determined at market prices. The exception was the price of one person working at a holding on a full-time basis (including executive and managerial work) calculated at the parity labour price rate. However, the latter was calculated as the difference of gross investments and depreciation. Vertical comparisons included indices of price fluctuations of goods and services purchased for consumption and investments.

Based on the above, the following farm subgroups were distinguished:

- characterised by management profit and a positive value of net investments, i.e. with competitive ability,
- three holding subgroups, i.e. the remaining farms without competitive ability.

Economic conditions in 2005-2007 and 2008-2012 differed. In the first year of the analysed period, agricultural holdings obtained very high direct payments, resulting in over a two-fold increase in their income. In the subsequent years, the payments continued to grow, but at a significantly lower pace.

In 2004-2007, also agricultural price ratios were favourable. The cumulative index of "price scissors" was then 107.3 (2003=100). In 2008-2012, price conditions deteriorated in comparison to the previous years, as indicated by the cumulative index of "price scissors" equal to 100. Therefore, economic conditions for running an agricultural business were less favourable in 2008-2012 than in 2005-2007[22].

Table 2. Number of farms with and without competitive capacity in 2005-2007 and their further situation in 2010-2012

Farm subgroups in 2005-2007	Number of farms surveyed in 2005-2007	2010-2012 share (%) of farms with:			
		management profit and a positive value of net investments	management profit and a negative value of net investments	no management profit and a positive value of net investments	no management profit and a negative value of net investments
Farms with competitive ability – characterised by management profit and a positive value of net investments	1253	46,5	25,3	13,4	14,8
Farms without competitive ability	4134	12,8	11,4	18,0	57,8

Source: Calculations by J. Sobierajewska and M. Zieliński based on figures derived from Polish FADN monitoring results.

In accordance with Table 2, only 46-47% of holdings distinguished by competitive capacity in 2005-2007 retained this favourable trait in 2010-2012. About ¼ stopped (paused) investing, which is not surprising in view of the deteriorating economic conditions for running a business, but still achieved management profit. However, the remaining holdings in this subgroup (28.2%) probably misinvested and lost their management profit in more difficult economic conditions than in an investment period (their price of own factors of production was below market rates), but about half of them attempted to rectify their mistakes making further investments.

It should be noted that in 2010-2012, from the group of farms without competitive capacity in 2005-2007 appeared about 13% of holdings having competitive capacity and about 11% that did not invest, but achieved manage-

[22] The cumulative growth rates of investments in Polish agriculture and hunting prove the same. In accordance with CSO statistics, this rate reached 153.1% in 2005-2007 (2004=100) and only 111.6% in 2008-2011 (2007=100).

ment profit. Unfortunately, the empirical material collected does not allow for indicating even hypothetical causes of these phenomena. Some other (18.0%) invested so as to ensure extended reproduction, despite achieving no management profit (their price of own factors of production was below market rates) and less favourable economic conditions for running a business than in the first part of the analysed period. However, those with no management profit and with negative reproduction of fixed assets (i.e. negative value of net investments) had the largest share (about 58%) in the subgroup of holdings without competitive capacity.

To conclude this part of the analysis, it should be added that 49.6% of all holdings in the analysed panel had the same characteristics in 2010-2012 as in 2005--2007. About 60% of them took no actions to improve their unfavourable situation.

Table 3 reveals that the subgroup of farms with the competitive ability was characterised in 2010-2012 by the following features:

- highest average farm size measured in SO and an area of agricultural land,
- price of own factors of production above market rates,
- fastest growth rate of the value of assets,
- relatively small share of direct payments in income generated by a farm and a small share of investment subsidies in income.

Moreover, farms in the second subgroup, characterised by their prudent approach to investing, achieved the price of own factors of production above market rates. As a matter of fact, their area of agricultural land was about one-fourth less than in the case of holdings with competitive ability, but their share of more intensive production types was greater. This is evidenced by a ratio of holding size measured in SO to an area of agricultural land. Direct payments affected their income to an extent similar to holdings having competitive capacity. It should be verified whether they benefited more from production services, thus limiting their capital expenditures and, consequently, cost of operating fixed assets, which would be used only in part by them.

Holdings with no management profit, but with a positive value of net investments were more than half the size of holdings with competitive ability, in terms of agricultural land measured in SO, and they still invested. They benefited from investment subsidies more than from long-term loans. It should be verified whether the heavy burden of the cost of operating fixed assets limited their agricultural income, thus increasing the role of subsidies in terms of income generation.

Table 3. Brief characteristics of identified farms subgroups in 2010-2012 (monetary values in 2011 prices)

Measures and indices	Holdings with:			
	management profit and a positive value of net investments	management profit and a negative value of net investments	no management profit and a positive value of net investments	no management profit and a negative value of net investments
Number of farms	1 113	787	914	2 573
Average: - farm size in SO (PLN thousand) - area of arable land (ha)	303 65	262 49	134 29	91 19
Profits-to-assets ratio (%) – profit rate	8	8	-9	-11
Payables-to-liabilities ratio (%)	18	11	10	4
Net investments-to-assets ratio (%)	8	-3	7	-4
Share of direct payments in income (%)	37	38	68	85
Share of investment subsidies in income (%)	3	2	6	3

Source: See Table 2.

Holdings in the last analysed subgroup achieved even smaller scale of agricultural production than holdings in the previous group, and less frequently benefited from loans and investment subsidies. Therefore, own funds did not allow them to invest to the extent necessary to ensure extended reproduction of their fixed assets. In this situation – to a greater extent than in the previous group – the role of subsidies in terms of income generation was even greater.

3.5. Conclusions

Domestic agricultural farms with competitive ability in the pre- and post--accession period will probably never be compared in a sufficiently precise way. Not avoiding reservations and only approximately, it can be estimated, based on the literature, that the number of holdings with competitive ability increased 2-3-fold in 2006-2008 compared to the situation in 1999. In the latter year, the number of holdings with competitive capacity was in fact 25-42 thousand, to reach 77 thousand in 2006-2008. This assessment covered all agricultural holdings possessed by natural persons with an area of agricultural land exceeding 1 ha.

It was shown that 20.7% of 5387 farms belonging to the size class of at least 4 SO analysed in this study were distinguished by competitive capacity in 2010-2012. Referring this rate to the number of agricultural holdings of this size in the country in 2010 (775.9 thousand), it could be estimated that there were around 160 holdings corresponding to the definition of such holdings.

The growth rate of the number of farms with competitive ability was limited in 2005-2012 by the unwillingness (aversion) of agricultural producers to finance investments from loans and investment subsidies.

About 28% of farms distinguished by competitive capability misinvested in 2005-2007. The number could be lower if their investments were operated under conditions not worse than those at the time of making a decision (the period from 2008 onwards is characterised by a decline in the domestic economy and a decline or even a crisis in most of the other countries of the world).

About 29% of farms characterised by no management profit and negative reproduction of fixed assets took no actions in 2005-2012 to improve their unfavourable situation. Perhaps their possessors were only counting on direct payments, because their income share was as high as 85%.

There was a group of farms (about 15%), which achieved management profit with no investments made to ensure extended reproduction of fixed assets. They could thus, for example, use services to reduce the fixed costs of running a business, but this thesis needs to be verified. Its confirmation would imply a revision of the definition of a holding with competitive ability, which was contained in the introductory note hereto. The definition should then emphasise the role of improving management or marketing skills of those possessing holdings as primary causal factors, rather than the role of investments in ensuring the sustainability of this capacity. In this situation, investments would be only part of the tools used to maintain the competitive capacity of agricultural holdings.

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4. Challenges and perspectives of Bulgarian small farms

4.1. Introduction

The structure of agricultural holdings in Bulgaria has a dual nature. This is expressed in a large number of small farms cultivating small part of the utilised agricultural area (UAA) and a small number of large farms processing a significant part of the UAA. Small farms are important in terms of providing an employment in rural areas, and they play a major role as a social buffer at times of economic crisis. These farms use a significant part of the production for own consumption, which limits agricultural incomes and opportunities for investment and structural development. An increase in the economic viability of small farms can contribute to an increase in employment and to the achievement of many second order effects in rural areas of the country.

The purpose of this paper is to identify the main challenges and perspectives of Bulgarian small farms in term of the new CAP. To realise this purpose from the methodological point of view, it is necessary to solve two major problems – firstly: to identify specific characteristics of small farms; and, secondly, to identify the factors for future development. In , there are different approaches to define the criteria and thresholds for classification of farms by size. Most often recommended criteria are: the size of UAA; economic size; degree of market orientation; and the level of employment of the workforce. The criteria are used for determining the size of the farm to easily identify which are the small farms in the country.

4.2. Data and methods

In our research we used the information collected from the Agrostatistic Department at the Ministry of Agriculture and Food, and a survey carried out with the support of the National Agricultural Advisory Services (NAAS) at the beginning of 2014. The survey sample was randomly determined by the concentration of projects in selected districts' axes of the RDP. The survey was held and organised with the assistance of the NAAS. The following set of tools was used to collect the necessary data:

- Survey of the RDP beneficiaries 201 respondents. Breakdown by priority is as follows: Axis 1 – 91 persons interviewed; Axis 2 – 45 respondents; Axis 3 – 38 persons interviewed; and Axis 4 – 27 persons interviewed;
- Focus groups with beneficiaries of the RDP. These respondents participate in discussions organised according to the following schedule.

When organising the study it was intended to address representatives of the beneficiaries of four axes of the RDP. It was priority to attract more applications under Axis 1 as its popularity is relatively highest and most beneficiaries have to say on it. Based on this principle the number of representatives under other axes was determined.

4.3. Current situation of small farms in Bulgaria

National Definition of the Term "Small Farm"

For the purposes of the policy to be implemented during the 2014-2020 programming period, the following definition of the term "small agricultural holding" or "small farm" shall be used:

- Economic size measured in a standard output volume (SOV) from EUR 2,000 to EUR 7,999, and
- Size of utilised agricultural area (UAA) up to 10 hectares.

The selected definition aims at directing the support to small farms with a development potential. Because of that reason, a value of the lower threshold of SOV of EUR 2,000 was approved, as under it, the majority of the holdings avail of a very poor level of market orientation. The larger part of the smallest farms does not strive for development or plans to withdraw from agriculture.

The upper threshold was set with the aim of directing the support to farms with limited economic resources and similar structural problems. It was also taken into account that the upper threshold of the economic size of the small farms set is, at the same time, the lower threshold of the size of young farmers' holdings supported.

Small farms number and territorial distribution

The number of small farms totals 85,770, which is 23.2% of all farms in Bulgaria[23]. Almost all of the small agricultural holdings carry out their activity in the capacity of natural persons or sole proprietors, whereas only 520 have

[23] Unless otherwise referred to, all data in the analysis was taken from the Agricultural Census in Bulgaria carried out in 2010.

registered as legal persons. Out of all small farms, the economic size of 69.3% of the small agricultural holdings does not exceed EUR 3,999, while the economic size of the remaining 30.7% is within the range of EUR 4,000 to EUR 7,999.

In the period between 2005 and 2010, the number of the small farms dropped significantly by about 68 thousand, which is 44.3% of all small holdings. The decrease in the number of small farms is significantly higher than the average drop in the overall number of farms in Bulgaria (Table 1).

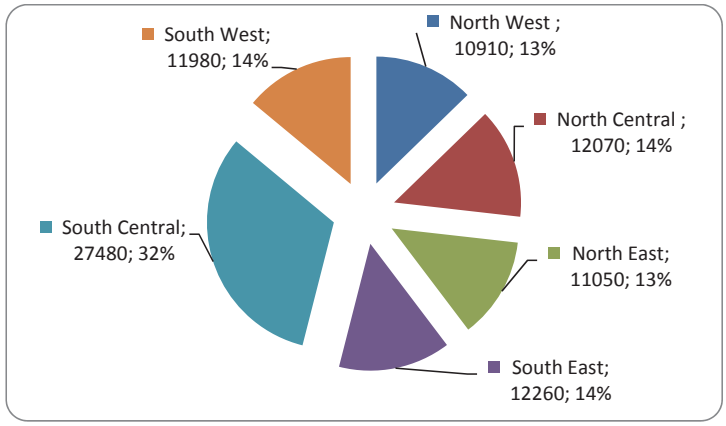
Table 1. Number of farms by year

Specification	2005	2007	2010	2005/2010
Bulgaria	534,610	493,130	370,490	-30,7%
Small farms	153,900	119,590	85,770	-44,3%
SOV from EUR 2,000 to 3,999	*108,720*	*81,490*	*59,480*	*-45,3%*
SOV from EUR 2,000 to 3,999	*45,180*	*38,100*	*26,290*	*-41,8%*

Source: Agrostatistics, MAF, Bulgaria.

In general, the distribution of the small farms in Bulgaria's planning regions (NUTS2) corresponds to the distribution pattern of all farms in the country (Figure 1). In the South Central planning region, 27.5 thousand of small farms develop their activity, which is 32% of all small agricultural holdings in Bulgaria. In the remaining five planning regions, the number of small farms varies between 11 and 12 thousand. Altogether, 22.1 thousand of small farms run business activity in the mountainous areas of the country, which is 25.8% of all small farms.

Figure 1. Distribution of small farms per planning regions



Source: Agrostatistics, MAF, Bulgaria.

Small farms utilised agricultural area and overall standard output volume

The utilised agricultural area (UAA) of the small farms amounts to 203,930 hectares or about 5% of the total UAA in Bulgaria. The distribution of the areas by utilisation type generally corresponds to the average figures for the country: 64.3% – arable area; 26.0% – permanent grassland; 8.4% – permanent crops; and 1.2% – kitchen gardens.

The average size of the utilised agricultural area of a small farm is 2.4 ha, compared to the average of 12.1 ha for all farms.

In the 2005-2010 period, the utilised agricultural area in the small agricultural holdings declined by about 20%. However, the favourable trend of a significant increase in the average size of the UAA per small farm was registered as well (from 1.6 to 2.4 ha).

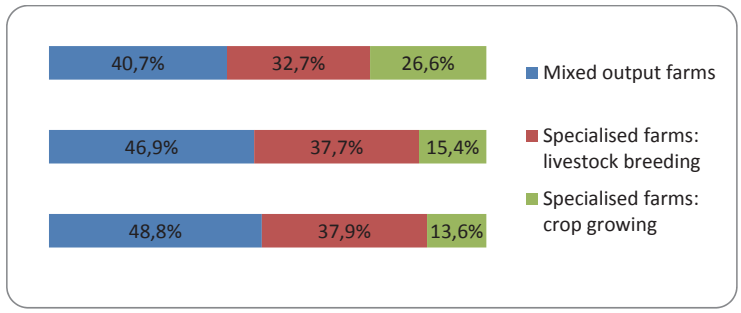
The overall standard output volume (SOV) in the small farms is EUR 308.8 million, which is 12.2% of the overall national volume. The average economic size of the small farms is EUR 3,600, which is almost twice lower than the average figure for the agricultural holdings in Bulgaria.

Small farms specialisation and economic situation

Within the structure of small farms, in 2010, the mixed output small farms had the highest share, namely 40.7%. The specialised livestock breeding farms were 32.7% of all small holdings, and the share of specialised crop growing small farms was 26.6%.

In the years following the accession of Bulgaria to the EU, significant changes were registered in the structure of small farms with respect to the type of output specialisation. The number and share of the specialised livestock breeding small farms and also of the mixed output small farms dropped significantly, whereas the number and share of specialised crop growing small farms increased by 25%, and their share among all farms rose by about 11 percentage points.

Figure 2. Small farms dynamics by output type

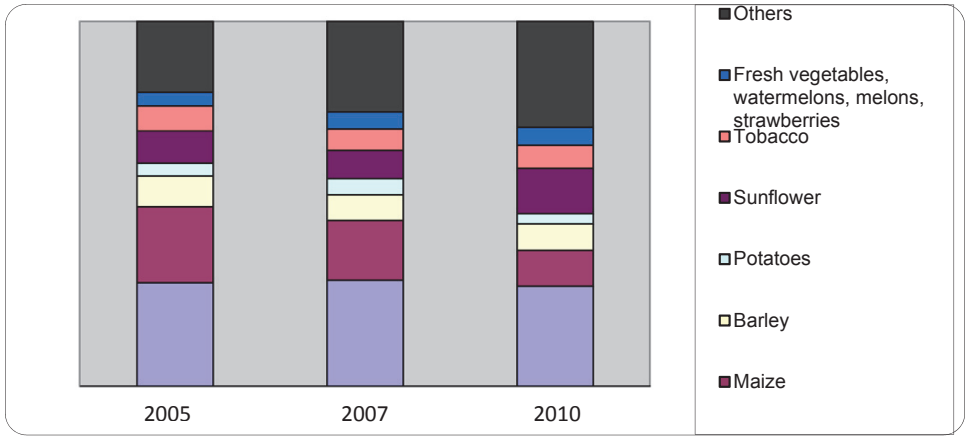


Source: Agrostatistics, MAF, Bulgaria.

Small farms specialised in crop growing

The distribution of the arable land per crop types in all kinds of small farms is presented in Figure 3. In the period between 2005 and 2010, a downward trend was observed in the share of arable areas with grains, and an upward trend in the share of other crops. In 2010, production of small farms was more diversified than in 2005. As expected, the share of the small farms in the arable areas sowed with grains and industrial crops in Bulgaria is very low (under 4%), and their share in areas sowed with fodder crops amounts to about 15%.

Figure 3. Arable area and permanent crops structure in the small farms (%)



Source: Agrostatistics, MAF, Bulgaria.

In 2010, about one-third of the arable areas under tobacco was planted by small farms. The arable areas under tobacco in the small agricultural holdings decreased by about 40% in the 2005-2010 period. However, the share of tobacco continues to be rather high, namely 6.3% of all the arable area occupied by small farms.

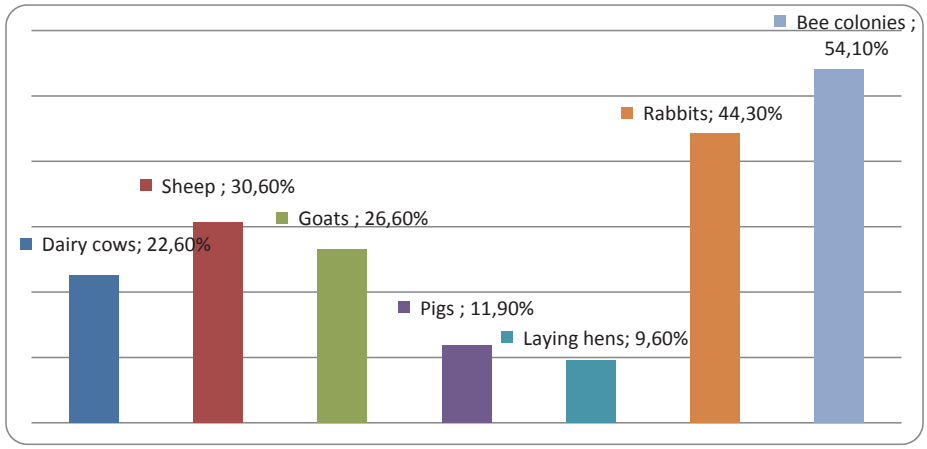
About 5% of the arable area cultivated by small farms is planted with fresh vegetables, watermelons, melons, and strawberries, which is a little more than one-fourth of the overall arable area under such crops in Bulgaria.

The arable areas under permanent crops in all small agricultural holdings total 17.2 thousand ha. In the 2005-2010 period, these areas marked a significant increase (30%). About 60% of the arable areas under permanent crops are planted with orchards and berry plantations, the remaining part being vineyards. However, over the past years, both the arable areas and the share of orchards have been increasing, while the areas under vineyards and their respective share have been decreasing.

Small farms specialised in livestock breeding

A total of 228.2 thousand livestock units are bred in the small farms, which is 19.9% of the total quantity for Bulgaria. The small holdings breed 22.6% of dairy cows of the country, 30.6% of sheep, and 26.6% of goats. Small farms also manage 54.1% of beehives (Figure 4).

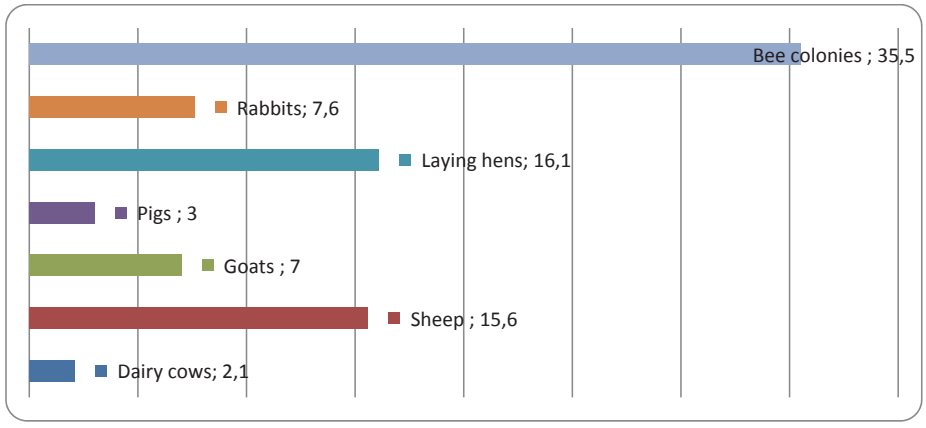
Figure 4. Relative share of small farms in national livestock



Source: Agrostatistics, MAF, Bulgaria.

In general, the small agricultural holdings specialised in livestock breeding are very miniature in size. On the average, they have 3.2 livestock units. Figure 5 presents average number of different animals in small farms.

Figure 5. Average number of animals in small farms

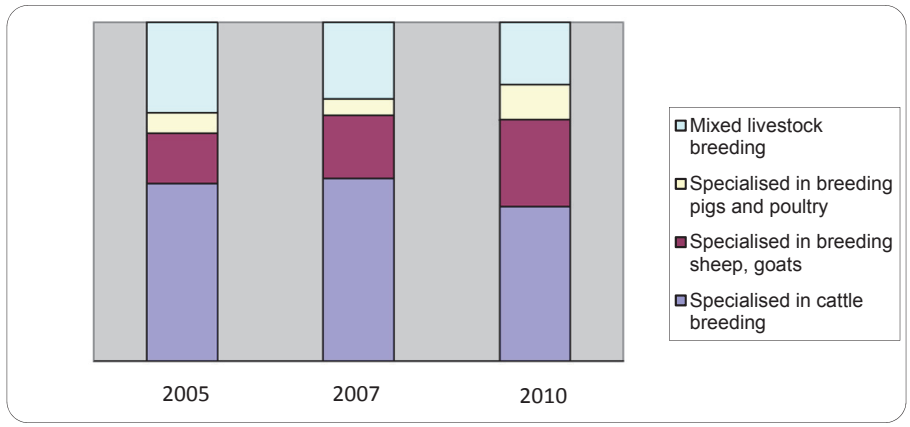


Source: Agrostatistics, MAF, Bulgaria.

As a whole, there is a stable downward trend in the number of animals on the farms with a specialised or mixed livestock breeding output, which is connected with the drop in the number of farms. In 2010, compared to 2005, the quantity of farms dropped by 2.2 times, and the amount of livestock units fell by 1.9 times. The number of livestock units per farm rose slightly from 3.2 to 3.6 units in the period between 2005 and 2010.

During the 2005-2010 period, dynamic changes occurred in the production orientation of small livestock farms (Figure 6). The share of farms specialised in cattle breeding and mixed livestock breeding decreased by 7 percentages. Breeding sheep and goats became more popular, and the relative share increased about double. The same situation is observed in breeding pigs and poultry.

Figure 6. Change of dynamics in the overall relative livestock unit numbers per farm type in %



Source: Agrostatistics, MAF, Bulgaria.

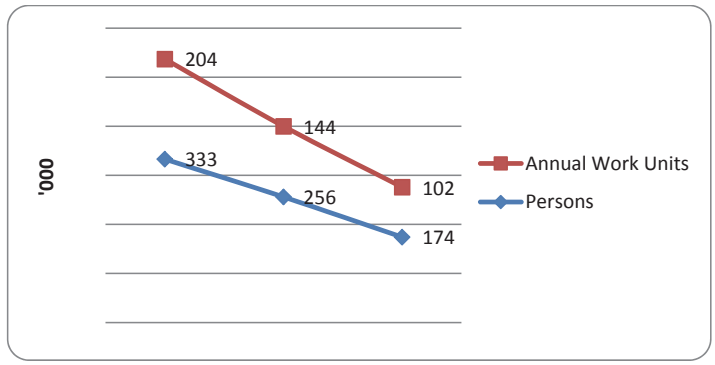
The major factors constraining the competitiveness of the small farms within the livestock breeding sector are the small size of the holdings, the poor availability of equipment, and the considerable expenditures needed to comply with the requirements of the EU with respect to the quality and safety of foods, environmental protection and animal welfare.

Workforce on the small farms

Between 2005 and 2010, a substantial drop in the employment rate and labour input was observed in the small agricultural holdings. The major cause for this decline was the decreased number of farms. The number of people regularly employed in the agricultural activities of small farms decreased from

335,820 in 2005 to 175,980 in 2010, which is a drop by 47.6%. Within the same period, the labour input in the small farms fell by 49.6%, and in 2010 it totalled 103,500 annual working units (Figure 7).

Figure 7. Trends in family workforce on small farms – people employed and working time spent on the farm

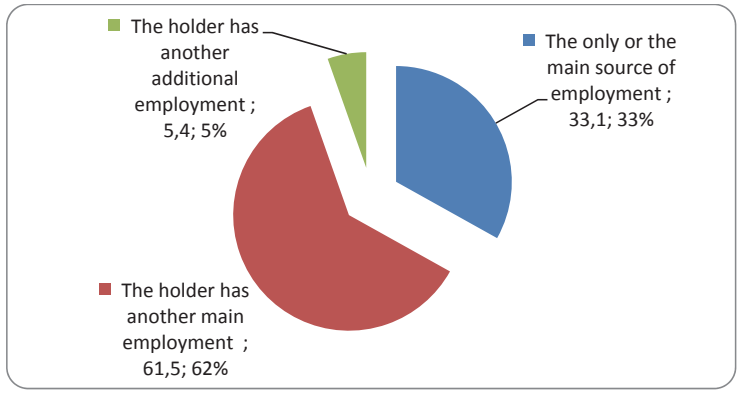


Source: Agrostatistics, MAF, Bulgaria.

The small agricultural holdings are family businesses. Almost all of the employment (99%) is provided for by the family members of the farm holder. One small farm employs 2 persons on average – the farmer and his/her spouse, the labour input being 1.2 annual work units.

The work on the farm is the only employment for the holders of 28.4 thousand small farms, or 33% of all small farms (Figure 8). In about one--fifth of the holdings, the agricultural activity is the only employment of the farm holder's spouse, as well.

Figure 8. Employment of the farm holder



Source: Agrostatistics, MAF, Bulgaria.

A very minor share of the small farm holders have a degree in agriculture or have attended agricultural training. This is typical for other farms in the country, as well. Only 0.7% of the farm holders have a higher education in agriculture, 3.1% have basic or general agricultural education, and the remaining 96.2% do not have any agricultural education, and they rather have practical experience alone.

The practical experience and the traditions in agriculture of the people regularly employed on the small farms are advantages for these holdings. The other strengths of this workforce that the small farms also benefit from are the high motivation, patience, readiness for work, and the orientation towards long-term objectives.

The relations of the farm holders with the local communities and their preference for the lifestyle in the rural regions contribute to the stability of the farms. An indicative fact in this respect is that according to a survey conducted in the form of a questionnaire, held in 2012 among a representative sample of the small agricultural holdings, 85% of the respondents stated that they have always lived in the same settlement, and 96% did not plan to migrate in the following 5 to 10 years. Moreover, one-third of the farm holders consider agriculture as part of their preferred lifestyle[24].

The intensified migration of the active population from the rural regions, the unfavourable working conditions and the low incomes in agriculture diminish the supply of workforce in this sector. This is the reason why farmers face difficulties finding skilled seasonal workers.

Small farms market orientation and market access

The small agricultural holdings differ in their market orientation rate. As a whole, more than two-thirds of the small farms produce the major part of their output sell it on the market. In the past years, a favourable upward trend was observed in the share of market-oriented small farms (Figure 9). The share of small agricultural holdings utilising more than half of their output for their own consumption dropped from 50.4% in 2005 to 27.8% in 2010. The share of the small farms producing mainly for their own consumption is higher among the specialised and mixed output livestock breeding farms (35.5%) and significantly lower among crop growing holdings (8.6%).

[24] The survey was held in 2012 under a project on the preparation of a rural development strategy for the 2014-2020 period. To the question "What is the main reason you are personally involved in agricultural activity?", 17% of the representatives of the small farms responded that they are active in the field of agriculture, because they earn well, 33% stated that the reason why is their love for nature and animals, and 50% named other reasons.

Figure 9. Number of small farms consuming more than half of their output

Source: Agrostatistics, MAF, Bulgaria.

The crop growing small farms sell their output, mainly, to wholesale merchants, and the livestock breeding small holdings sell it to food processors. Due to the higher expenditures for distribution and the larger market leverage of the intermediaries and the processors, the small farmers do not get the best market price. The small output quantities and the variable quality of output also negatively affect the market positions of the small agricultural holdings. The lack of knowledge and skills among the small farmers to study the market, their minimal awareness of the market situation and the marketing of the output also deteriorates their market positions and limits the capabilities of these farmers to respond quickly and adequately to the market trends.

Another problem small farms face is the lack of long-term agreements with the food processors and the wholesale merchants. According to the small farm holders, the main reasons why they do not benefit from long-term agreements are the unstable market prices, the risk of failing to perform their contractual obligations, and the insufficient legal force of the agreements.

The system of agricultural input markets in the country is insufficiently effective. Such markets have been set up throughout Bulgaria, but not all of them operate according to their purpose. The remaining elements of the agricultural goods trade system, such as auctions, futures contracts, etc., are underdeveloped, which hampers both the sales of agricultural input, and the competition among farmers and merchants when deals are struck.

There are no specialised marketplaces for local producers in the urban centres of Bulgaria. The functioning open-air marketplaces offer mainly agricultural products of a diverse origin, bought at the agricultural input markets, and thus do not ensure the direct contact between producers and consumers.

In the past years, the increase in the territorial coverage, density and market share of the large chains of supermarkets has also become a problem for the small agricultural holdings. The latter are not in the position to independently offer regular supplies of large enough output quantities demanded by the supermarket chains and thus the producers lose their market positions.

The small farms are also subject to unfair competition practices, such as the unauthorised import of agricultural input of a poor quality and at low market prices, the sales of agricultural products at unauthorised marketplaces, and the misuse of market force on the part of the intermediaries.

Notwithstanding the governmental policy of supporting the groups and organisations of producers, the availability of such organisations is limited throughout the country, because of the reluctance of the farmers to unite and the lack of support to launch and set them up. As of the end of 2013, there was only one acknowledged farmers' organisation. The lack of effective producer organisations does not allow the small farms to benefit from the possibilities of the EU funding for the sector and deteriorates their market positions.

The direct sales by producers are underdeveloped in Bulgaria. The direct sales through informal channels prevail. The development of direct selling is obstructed by legislation, which puts high requirements on farmers limiting the volume and share of the products of animal origin that may be offered for direct selling, as well as the regions where such products may be sold[25]. This is the reason why there are only 230 farmers registered for direct sales in accordance with the national legislation in Bulgaria. Out of them, 170 are the producers of bee products. The local foods and the direct sales are integrated into the tourism development strategies to a very low extent.

In Bulgaria, the voluntary certification schemes for foods and products, and the short supply chains are underdeveloped, too. This fact obstructs the development of strategies on the part of small producers aiming at adding value to their output based on its quality and origin.

Such a development does not meet the expectations of the Bulgarian consumers, who are more concerned with the quality and origin of food products then the average European consumers. Public opinion polls, carried out by Eurobarometer in 2011 and 2012, registered a significant interest among Bulgarian consumers in origin of the foods and healthy eating habits. This provides for the market expansion of the local products and products of certified quality and origin. Notwithstanding their low incomes, 98% of the Bulgarian households consider quality an important factor for their choice of food, and 78% even

[25] Decree No. 26 of 14 October 2010 *on the specific requirements for direct supplies of small quantities of raw materials and foods of animal origin*.

regard quality as a very important factor in this respect. The origin of foods is an important factor for the food choice of 74% of the consumers in Bulgaria, the same being a very important factor for 41% of the respondents[26].

Small farms support granted in the 2007-2013 programming period

In the 2007-2013 programming period, the development of small agricultural holdings was supported under several measures of the 2007-2013 Rural Regions Development Programme (RRDP). The measures aimed at encouraging the restructuring and co-operation, facilitating the access to information, training and advisory services.

Measure 141 – Support for semi-subsistence farming in the process of restructuring, is significant for the agricultural sector. Its objective is the restructuring of the semi-subsistence agricultural holdings and improvement of their viability and market orientation. This measure supports farms of a small economic size (from 1 to 4 economic units) by granting them financial assistance to the amount of the BGN equivalent of EUR 1,500 annually for a maximum period of five years.

Throughout the whole programming period, 9,446 applications for support under this Measure were filed, and 8,634 were approved for assistance, the total amount of the public expenditures made amounted to EUR 64.3 million. The mid-term assessments point out that the semi-subsistence crop growing farms show the highest interest in this Measure. These holdings constitute 60% of all applicants who filed their documents, and the remaining 40% are equally distributed between the bee breeding, livestock breeding and mixed output farms. About 90% of the approved applications were filed by agricultural holdings of up to 5 ha.

The lessons learned from implementing the Measure show that some time and a well-focused information campaign are needed to provoke the interest of the small farmers. The implementation of the Measure began in September 2008, but until the end of 2010, only 1,650 applications for support were filed. The information campaign held, including the one carried out on the part of the NAAS, exerted a large impact on raising the interest in applying for assistance under Measure 141.

An additional stimulus for applying and confidence of the potential beneficiaries was achieved by overcoming the delay in examining the support applications, and the actual execution of the payments for the approved operations in 2011. In this respect, the decentralisation of the application process contributed

[26] Eurobarometer *Europeans' Attitudes towards Food Security, Food Quality and the Countryside*, 2012.

to the successful appropriation of the budget under this Measure. Since 2011, the assistance applications and the payment forms have been filed and processed in the regional directorates of the State Agriculture Fund (the Paying Agency of the RRDP). This significantly shortened the period of documentation processing and prevented the accumulation of a large number of waiting applications. The deadline set for approving the operations applying under Measure 141 is four months, but after the decentralisation of its implementation, the approval was usually received within 2 months after applying. All these factors resulted in a significant increase in the number of potential beneficiaries in 2011 and 2012, when respectively 2,280 and 5,500 applications were filed.

According to data from the mid-term evaluation, the assistance for the preparation of the support applications and business plans played a significant role in the high performance of the objective set for the number of supported farms. In the 2007-2013 programming period, the documentation was prepared by the NAAS with the financial assistance from the budget of the RRDP, whereas for the beneficiaries under the Measure, the services of the NAAS were free of charge.

The data from the mid-term evaluation also show that the supported farmers are of the opinion that funds under the Measure help them to modernise and expand their activities, and also to enter the market on a larger scale. The assessments of the Measure's efficiency point out that the amount of the support granted is insufficient to restructure the farms, and therefore the granting of additional financial assistance under other measures of the Programme, aiming at modernising the farms and diversifying their activities, is needed[27].

Another measure of the RRDP addressing the small agricultural holdings is *Measure 143 – Provision of farm advisory and extension services in Bulgaria and Romania*. It aims at facilitating the access of farms to the funding of the RRDP and achieving compliance with the requirements and standards of the EU. The NAAS was selected as the sole beneficiary under this Measure. The assistance rendered by the NAAS implies the provision of the full set of advisory and extension services to the agricultural producers eligible for funding under four of the measures of the RRDP. The advisory services include preparation of the business plan and completion of the application form, advice on complying with the requirements for maintaining the land in a good agricultural and environmental condition, and advice on tackling the problems of environmental protection in agriculture.

In the 2007-2013 programming period (as of 30.09.2013), the NAAS provided 19,827 sets of advisory and extension services (SAES) to farmers.

[27] D. Nikolov, *Social and Economic Stability of the Semi-Subsistence Farms*, 2009-2010.

Out of them, 9,341 applied under Measure 141 – Semi-subsistence farming; 4,406 applied for the funding under Measure 112 – Setting up of young farmers; 2,841 were the applications for Measure 214 – Agri-Environmental Payments; 206 applied under Measure 121 – Modernisation of agricultural holdings; 1,536 were the SAES for evaluation of farms and identification of improvements needed with respect to the legal requirements for their management; and 1,492 were the SAES for the management of agricultural holdings and specific advices in the field of crop growing and/or livestock breeding. The implementation of the measure exerted active influence not only on increasing the interest in applying for support and ensuring access to the resources under the RRDP for small farms, but also on the improvement of their agricultural practices, knowledge and skills.

The application of the small agricultural holdings for support under the investment measures of the RRDP (Measures: 121 – Modernisation of agricultural holdings, and 311 – Diversification into non-agricultural activities) is hindered because of the lack of experience on the part of small farms to prepare projects and operations. As already pointed out, the small agricultural producers face significant difficulties in ensuring the pre-financing of investments and providing for their own financial contribution. The preparation of investment operations, the management of the project documentation and the administrative burden are problematic for the small farms, as well.

The lessons learnt from the implementation of the measures mentioned above show that it is necessary to facilitate the application procedures and to mitigate the administrative burden on the smaller agricultural holdings to ensure their access to the support and assistance under the Programme.

4.4. Factors of future development

Collaboration and networking

Besides the land as a condition for farming, small farms need a supply chain of raw materials, knowledge and skills for effective production. They also need advanced technologies, machines and access to the relevant markets. In addition to the above-mentioned restrictions there are difficulties with irrigation, high fuel prices and fertilisers. To solve these problems it is necessary to establish collaboration and networking among farmers. Theory and international experience show that networking is designed to correct market failures. It is able to solve the problems of small individual farmers with the benefits of greater scale and size. Collaboration and networking improve access to raw materials and help to achieve increasing market strength. They also allow to secure

the overall risk reduction through portfolio diversification effects. This improves farmers' capability to pay the debt and also enables them to borrow at lower interest rates. Therefore there is an increasing interest in the direct sales market, but this does not diminish the importance of cooperative for services. A strong government support is need in order to impose these factors for future development of small farms.

Access to credit

Generally small farms need to have access to two types of credit: long-term loan to finance investments in fixed assets and short-term credit to finance working capital (i.e., to bridge the gap between temporary shortage of funds to finance production costs and revenues from sales). Very popular solution to credit problems is the establishment of credit cooperatives. These are small specialised credit cooperatives that rely on mutual guarantee and strong peer pressure for successful operation. Their work is not interconnected with the supply of raw materials or marketing of products, their task is to lend money to its members for business purposes (including agriculture). Credit cooperatives are an excellent solution for small farms. In Bulgaria, the "Scheme for Agricultural Capital Fund" – SZKF (ACFS) was created in 1996, which was agreed in the same year between the Bulgarian Government, namely the MAF and the EU PHARE programme. Thirty-three credit cooperatives were created that currently have a membership of 14,000 people. The lack of an appropriate legal framework that defines the deposit and credit cooperatives as part of the formal financial sector limits their further spread and development. According to the Bulgarian National Bank, 26 credit cooperatives were registered in 2013. However, currently new credit cooperatives of this kind cannot be formed on their basis. The established cooperatives that had mutual funds also cannot be registered as financial institutions because of legislation restrictions. Cooperatives can mobilise free cash and untapped labour potential population. In that way they can promote long-term capital, they can also provide jobs and income in agriculture. Development and strengthening of rural cooperatives is a basic factor of complete and successful absorption of the EU structural funds.

Consultancy and education

The holders of small farms need coaching and training related to new knowledge and technologies in conventional and organic production. According to the annual reports of the National Agricultural Advisory Service (NAAS, 2011, 2012) over 88% of the provided consultation services provided are intended for small farmers. These farmers need counselling the most, but due to the

small size of farms and their income, they are not targeted to private consulting companies. From the perspective of meeting the needs in the field of consulting small farms should strengthen the role of the NAAS and institutes of agricultural academy. In this context, a need emerges to expand the capacity of the NAAS in order to meet the ever-increasing demand for advice concerning small farms.

4.5. Conclusions

The results of this analysis can be summarised in several aspects related to maintaining and improving the economic viability of small farms in the future. One of the aspects is to increase the size of small farms. It can be done by development of the land market. Another way is to develop market services like information systems, supply chain, marketing and processing. These tasks can be achieved effectively by stimulating collaboration and networking.

Another issue that should be considered is the question of agricultural finance. The efforts to develop credit cooperatives as a source of financial services for small farms should be continued. Finally, the role of the NAAS in providing counselling to small farms should be expanded. In this context, the network of this structure should be revised in order to maximise coverage and consulting of small farms. Credit cooperatives composed of small farms can also be involved in this process by providing support for those services. Modern agriculture cannot develop effectively without science and research. Small farms are not capable to optimise their operations without information and professional education. In this regard, the development of agricultural science, education and research should be encouraged. Application of innovation, knowledge and education are the key ingredients of the success of small farms.

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5. Organisational and economic issues and challenges of open-field vegetable production in Plovdiv region after the EU enlargement

5.1. Introduction

The challenges that Bulgarian vegetable production has been facing since the accession of our country to the Common European Market in 2007 are associated with overcoming of some organizational and economic issues such as the low level of production efficiency and weak competitiveness of agricultural production. Encouragement of farmers to produce quality and competitive fruit and vegetable production in compliance with the requirements of European markets should be a basic priority of Bulgarian agricultural policy.

Vegetable production is a very labour-intensive branch of plant growing sector. The challenges that vegetable producers face are associated with the cultivation and marketing of their vegetable production, which provides the biggest return on resources used in it.

5.2. Materials and methods

The level of average yields of the vegetable farms in Plovdiv region for the period 2007-2012 is a major factor that influences the effectiveness of field vegetable production. Table 1 presents the average yields of the main vegetables grown in Plovdiv region over the period from 2007 to 2012.

Table 1. Average yields (kg/dca) of vegetable farms in Plovdiv region for the period 2007-2012

Crops	2007	2008	2009	2010	2011	2012
Tomatoes	2120	2410	2340	2490	2804	2755
Cucumbers	3695	3536	3797	3210	2970	2088
Peppers	1900	1956	1895	1850	1730	1868
Onions	1710	1736	1783	1702	1690	1672
Cabbage	3120	2990	3064	2870	2710	2670
Watermelons	2830	2868	2868	2790	2840	2320

Source: Own research.

It is notable that during the survey period the average level of yields increased for almost all vegetable crops. The lower average yields had an adverse effect on the production effectiveness since they reduced the incomes of farmers who cultivated vegetables.

The level of production costs of farms growing vegetables in Plovdiv region for the period 2007-2012 was directly affected by the economic situation in the country. The main components of production costs – raw materials, supplies and labour consumption, cannot be considered in isolation from the economic processes taking place in Bulgaria.

Table 2. Production costs (BGN/dca) of vegetable farms in Plovdiv region for the period 2007-2012

Crops	2007	2008	2009	2010	2011	2012
Tomatoes	964,8	978,5	1027,3	1372,42	1483,5	1431,62
Cucumbers	1783,2	1863,42	1810,02	1589,9	1392,3	1721,14
Peppers	1283,4	1352,24	996,1	1022,34	1186,7	1203,82
Onions	584,4	637,5	757,41	753,2	703,96	786,6
Cabbage	484,76	559,17	576,1	699,11	684,8	758,36
Watermelons	608,3	659,62	618,84	640,18	730	701,35

Source: Own research.

The data presented in Table 2 show an increase of production costs during the survey period, with certain fluctuations during the years, and in some vegetable crops – peppers for example, there was a reduction of these costs at the expense of material costs. In cucumbers there was a reduction both in material costs as well as in labour costs. Overall, however, there was a prevalence of the tendency of increase in production costs for cultivation of vegetables in Plovdiv region for the period 2007-2012, which was a natural process associated with inflation, not with the intensification of production. Material costs varied according to the type and quantity of fertilizers used, type and frequency of use of plant protection products, method of irrigation – drip or surface irrigation, agricultural equipment used in accordance with the type and technology of cultivation of the relevant vegetable.

In vegetable production there are a number of organizational and economic issues such as: lack of good organization in the production sector characterized by a low technological level; production with high costs, including high prices of seeds, fertilizers, plant protection products, irrigation water; lack of mechanization and use of human labour in harvesting. Producers' low degree of organization, lack of commercial arrangements between producers and

dealers regarding the realization of output, low buying-in prices of vegetables, use of low-skilled workers – all these are significant organizational and economic issues of the sub-sector waiting to be resolved for many years.

5.3. Results and discussion

Despite the difficulties accompanying vegetable production, still, there was a profit from all vegetables grown in the region. There was a higher profit in the production of tomatoes and cabbage during the second period – 2010-2012 in comparison with the first period, from 2007 to 2009. What was essential to the profit growth was the selling price, which increased in all crops surveyed.

As a whole, however, the profit remained relatively low in all vegetables.

Table 3. Profit from 1 dca vegetable production in Plovdiv region for the period 2007-2012

Crops	Profit BGN/dca		Profit BGN/ton	
	Period 2007-2009	Period 2010-2012	Period 2007-2009	Period 2010-2012
Tomatoes	93,72	171,68	40,93	63,99
Cucumbers	668,55	315,48	181,87	114,47
Peppers	73,81	42,78	38,45	23,56
Cabbage	122,57	130,17	40,08	47,28
Onions	110,06	70,76	63,14	41,92
Watermelons	153,50	11,74	53,56	4,43

Source: Own research.

Table 4. Influence of average yields, selling price and production costs on change in profit from 1 dca of vegetable production in Plovdiv region for the period 2007- 2012

Crops	Total profit deviation in BGN	Average yield	Selling prices in BGN	Production costs in BGN	Material costs in BGN	Labour costs in BGN
Tomatoes	+77,96	+186,02	+330,92	-438,98	-280,16	-158,82
Green peppers	-31,03	-67,67	-24,04	+60,68	+122,04	-61,36
Dry onions	-39,30	-24,30	+73,15	-88,15	-68,74	-19,41
Cabbage	+7,60	-66,09	+247,77	-174,08	-112,29	-61,79
Cucumbers	-353,07	-622,53	+18,36	+251,10	+45,98	+205,12
Watermelons	+7,60	-66,09	+247,77	-174,08	-112,29	-61,79

Source: Own research.

Table 4 shows the changes in profit from 1 dca of vegetable production produced in Plovdiv region for the period 2007-2012, under the influence of the factors average yield, selling price, material costs and labour costs.

In tomatoes, the significant increase in profit deviation (+77,96 BGN) for the period 2010-2012 in comparison with the period 2007-2012, was a result of the positive trends in the change of selling price (+330,92 BGN) and average yield (+186,02 kg). The other two factors acted in a negative direction where the negative influence of both material costs factor (-280,16 BGN) and labour costs factor (-158,82 BGN) played a decisive part. In the production of green peppers there was a reduction of profit from 1 dca with BGN 31,03. Besides, the factors that influenced the size of this index acted in different directions. The average yield factor (-67,67 BGN/dca) and the selling price factor (-24,04 BGN) acted in a negative direction, while the production costs factor acted in a positive direction which was a result both of the reduction in labour costs (-61,36 BGN) and the increase in material costs but here the influence of material costs was determinative (+122,04 BGN).

In dry onions the profit deviation from 1 dca during the second period was -39,30 BGN in comparison with the first period. With the exception of the selling price which, being a factor for the change in profit, acted in a positive direction (+73,15 BGN), all other factors acted in the opposite direction.

In cabbage, the change in profit from 1 dca was positive (+7,60 BGN), which revealed a favourable trend. The increase of selling price factor (+247,77 BGN) was decisive for this growth, while the other two factors acted in a negative direction, including the average yield factor (-66,09 BGN/dca) and production costs factor (-174,08 BGN), which comprised material costs (-112,29 BGN) and labour costs (-61,79 BGN).

The most significant decrease in profit from 1 dca is observed in cucumbers. In this vegetable crop the profit from a unit area decreased with 353,07 BGN over the period from 2010 to 2012 in comparison with the period from 2007 to 2009. What was decisive here was the negative influence of the average yield factor (-622,53 BGN/dca), while the other two factors acted in a positive direction, respectively the selling price factor (+18,36 BGN) and production costs factor (+251,10 BGN), which comprised material costs (+45,98 BGN) and labour costs (+205,12 BGN).

In the production of water-melons there was a positive change in profit from a unit area which was basically due to the positive changes in the selling price – its influence was positive (+247,77 BGN). The other two factors acted in a negative direction where the influence of production costs factor (-174,08

BGN), including material costs (-112,29 BGN) and labour costs (-61,79 BGN), played a decisive part.

Having in mind the above said regarding the profit, we may draw the following conclusions:

- The trends in profit change from 1 dca of vegetable production produced in Plovdiv region over the period from 2007 to 2012 were rather diverse in direction. There was a positive change in this economic index in the production of tomatoes, cabbage and water-melons, the highest one being in tomatoes: +77,96 BGN. The opposite trend was observed in green peppers, dry onions and cucumbers – there was a reduction in profit from 1 dca of vegetable production, most significantly expressed in cucumbers: (-353,07 BGN).
- Considering the factors surveyed, the selling price factor was the one acting in a positive direction in all vegetables grown in the region (except for the green peppers). The unfavourable negative trend in the index change under the influence of the average yield factor is also analogical. In all vegetable crops (with the exception of tomatoes) the factor acted in a negative direction.
- Production costs, including material costs and labour costs, had different effect over the change in profit from a unit area.

5.4. Conclusions

Based on the above presented studies and results connected with the production of the main vegetable crops in Plovdiv region and with an emphasis on the basic organizational and economic issues in the sector, we may draw the following conclusions:

1. The average yields of the main vegetables grown in Plovdiv region are lower than their potential biological productivity. It is noticeable that during the survey period from 2007 to 2012, the average yields of vegetable crops in Plovdiv region were rather fluctuating, though an *overall increasing trend* was observed.
2. There was an increase in production costs during the survey period, with some fluctuations in years. Overall, however, there was a prevalence of the tendency of increase in production costs for cultivation of vegetables in Plovdiv region for the period 2007-2012. To a large degree the level of production costs depends on the inflation processes taking place in the country – in most cases they are closely related to the rising prices of main raw materials and supplies as well as to the rise in the cost of labour.

3. The instability of the survey indexes associated with vegetable production in Plovdiv region show serious organizational and economic issues related to the development of this industry.

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II. Structural transformation and competitiveness of the food industry

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1. Hungarian food processing on a slippery slope

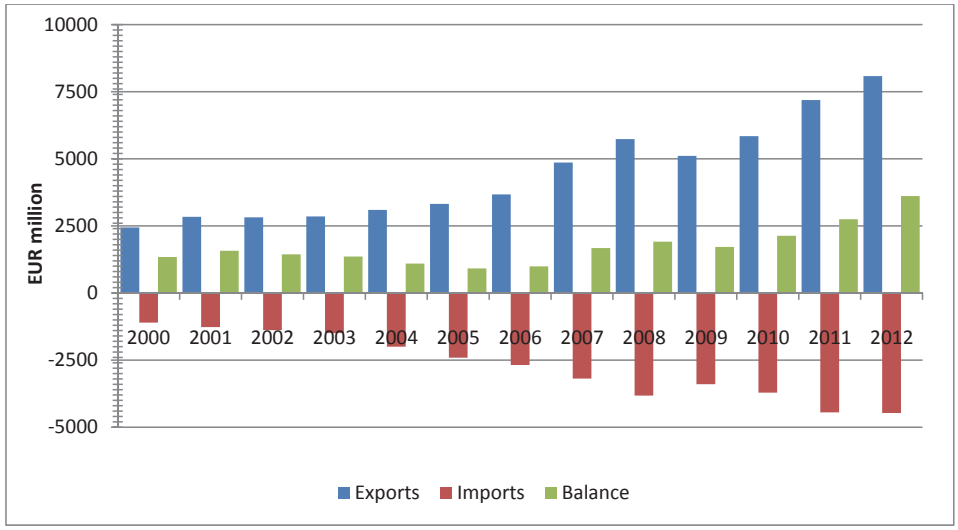
The aim of this paper is to briefly summarise the general causes of the setback of agro-food processing in Hungary in the past decade, based on the presentation with the same title from the conference *Achievements and challenges in the food sector and rural areas during the 10 years after EU enlargement* (Rawa Mazowiecka, Poland, 12-14 May 2014).

Hungary, traditionally a surplus producer of agro-food products, has maintained its net exporter position since European Union (EU) accession. During the period 2000-2012, its agro-food exports and imports have increased in nominal terms from EUR 2.44 billion to EUR 8.08 billion and from EUR 1.10 billion to EUR 4.47 billion, respectively. Although the trade balance fell from EUR 1.34 billion in 2000 to EUR 916 million in 2005, since 2007 it has exceeded the level of the pre-accession years, reaching EUR 3.61 billion in 2012.

The growth of the Hungarian agro-food trade balance seems spectacular but its structure has changed significantly over the years. According to the calculations of the Research Institute of Agricultural Economics (AKI) based on Juhász and Wagner [2010], the nominal value of goods of primary and secondary processing represented only 26.9 per cent and 7.2 per cent, respectively, of the agro-food trade balance in 2011. This compares to 31.7 per cent and 31.2 per cent in 2000, while the share of agricultural commodities increased from 37.1 per cent in 2000 to 65.9 per cent. This development clearly hints at the erosion of the competitive edge of the domestic agro-food processing industry that became prominent in particular during the first five years of EU membership. In 2012, however, the share of secondary processed products jumped by 8.3 percentage points to 15.5 per cent, a considerable shift which can be explained by the boom of maize-based fuel ethanol exports and the fall of fuel ethanol imports, and by the expansion of pet-food sales. In general, the growth of the Hungarian agro-food trade balance in the past few years has largely been

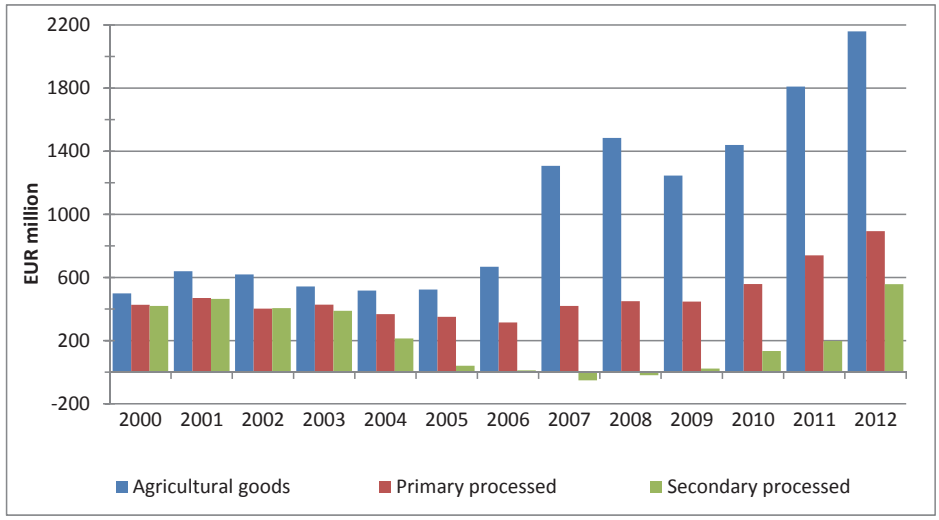
due to the increase in the value of cereals and oilseeds exports[28] (Figures 1 and 2). Next to cereals and oilseeds, major agro-food export products of Hungary included meat and meat products, and fruits and vegetables.

Figure 1. The evolution of agro-food trade in Hungary, 2000-2012



Source: KSH.

Figure 2. The structure of the agro-food trade balance in Hungary, 2000-2012



Source: Department of Food Chain Analysis of AKI.

[28] Cereals exports increased in volume terms too which is primarily owing to the fall in livestock numbers, in particular pigs.

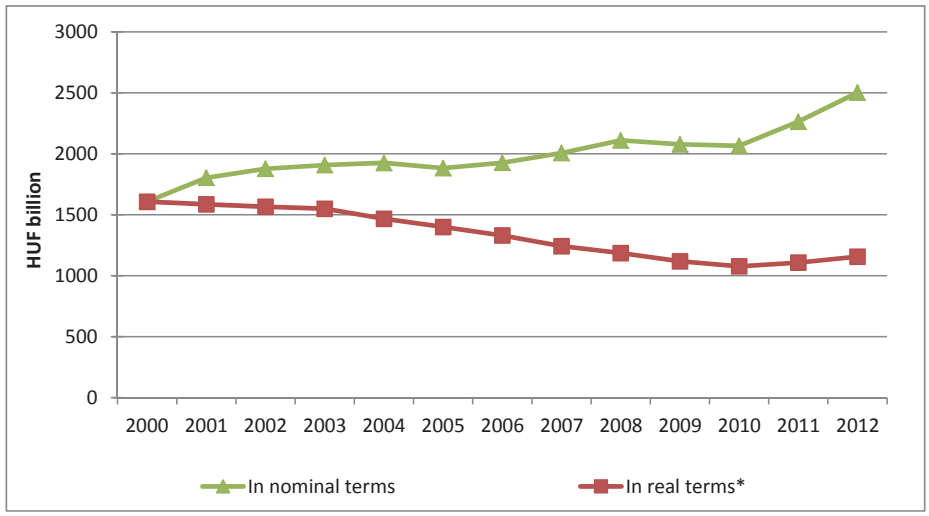
Hungarian agro-food products are traded mostly with other European countries. During the period 2010-2012, major buyers of these products included Germany with on average EUR 959.8 million worth of imports per year, followed by Romania (EUR 865.1 million), Slovakia (EUR 778.2 million), Italy (EUR 620.0 million) and Austria (EUR 614.9 million). Poland ranked seventh with EUR 300.7 million behind the Netherlands (EUR 385.8 million).

The most important agro-food import products of Hungary are fruits and vegetables, followed by meat and meat products, dairy products and soybean meal. For meat and meat products as well as for dairy products the trade balance has been negative in the past few years. Hungary imported on average EUR 100.4 million worth of meat and meat products per year from Poland (staking a 24.6 per cent share of the total imports of meat and meat products) during the period 2010-2012. As a supplier, Poland was second only to Germany with EUR 120.3 million (29.4 per cent), followed by Austria with EUR 50.5 million (12.3 per cent). In the same time, Hungary imported EUR 53.7 million worth of dairy products per year from Poland (16.0 per cent), ranking again as the second largest supplier next to Germany with EUR 108.8 million (32.5 per cent), followed by Slovakia with EUR 48.9 million (14.6 per cent)[29].

The production of food, beverages and tobacco products ranks, in value terms, as the third highest of the 13 industry branches in Hungary. The production value of agro-food processing increased, in nominal terms, by an average of 3.8 per cent per year from 2000 to 2012. In real terms, however, its production value shrank by 1.9 per cent annually during the same period. The food price hikes experienced since 2007 have disguised the poor performance of the sector: while its output surged, in value terms, by 55.7 per cent, its production volume fell by 28.1 per cent during the period 2000-2012 (Figure 3).

[29] It is interesting to further detail the trade of meat and meat products and dairy products between Hungary and Poland in recent years. Hungarian exports of poultry meat to Poland averaged 4.9 thousand tonnes per year during the period 2010-2012, meaning that Hungary was the sixth most important poultry meat supplier to that country. On the other hand, poultry meat imports from Poland exceeded this amount by far, being 7.3 thousand tonnes per year on average, placing Poland third among the sources of poultry meat imports. Poultry meat imports from Poland increased by over 40 per cent during the three year period. Poland also sold on average 37.3 thousand tonnes of pig meat to Hungary, ranking as second. It was also the second biggest source of imported cheese and quark for Hungary during these three years, supplying slightly over 67 thousand tonnes per annum.

Figure 3. The output value of agro-food processing in Hungary, 2000-2012



* Constant 2000 prices.
Source: KSH.

The setback of agro-food processing in Hungary can be attributed to a number of factors. The country constitutes a minor consumer market in the EU and agro-food processing enterprises, even the subsidiaries of foreign holdings, are small in international comparison. Following EU accession, support funds were cut back and at the same time the domestic market became fully liberalised which impacted the sector rather unfavourably. International retail chains, already dominating food retailing in Hungary, and wholesalers have had greater opportunity to import and offer competitive products, exercising a downward price pressure on their suppliers and squeezing out domestically produced goods from the shelves. Most of the processors were unprepared for this and their failure to invest in modernisation during the pre-accession years has proven to be decisive. They have been striving to maintain their shrinking share in the domestic market as well as abroad since EU accession, but with little success owing to high interest rates[30], to their increasing indebtedness and lack of capital, as well as to their obsolete technology and lack of product, process, and organisational innovation, small production volumes and weakening bargaining position [Popp et al., 2008]. Only a few of them have been able to expand their activities, the rest have had to face increasing underutilisation of their production

[30] Interest rates on investment loans reached 14-16 per cent in the second half of the 2000s compared to 4-5 per cent in Slovakia and Poland, which later increased to 8-9 per cent due to the economic crisis.

capacities. Most of the enterprises that ultimately went bankrupt were Hungarian owned and their acquisition and business operation had been financed mainly from credit loans. But, as Juhász and Wagner [2010] conclude, the lack of appropriate business and trading skills of the management were also factors significantly contributing to the generally poor performance of agro-food processing in the past decade.

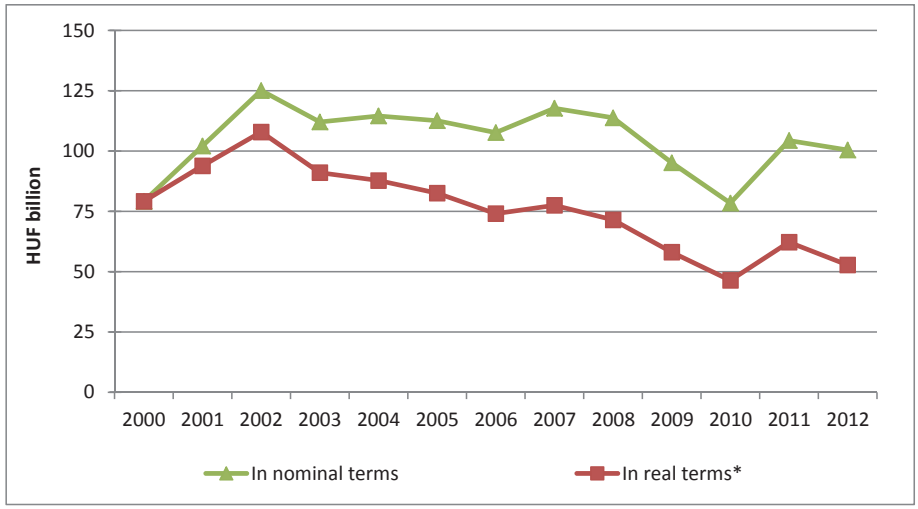
Support policies had an underlying role in the decline of the sector too. Before accession to the EU, the complex system of administered prices in agriculture, export subsidies – often criticized by other countries in the Visegrad Group – *ad-valorem* import tariffs and tariff rate quotas as well as direct income subsidies granted to agro-food processing enterprises concealed the absence of efficiency and lagged technological development. Investments that would have been necessary to prepare for EU membership and full market integration were not implemented in due time.

Prior to becoming an EU Member State, the EU Special Accession Programme for Agriculture and Rural Development (SAPARD) provided in total EUR 283 million for Hungary for four broad groups of measures including the improvement of the processing and marketing of agricultural and fishery products. After EU accession, implementation of the Agriculture and Rural Development Operational Programme (ARDOP) and the National Rural Development Plan (NRDP) for the EAGGF Guarantee Section measures started, both covering the period 2004-2006. The ARDOP and NRDP were worth EUR 429 million and EUR 754 million, respectively, for these three years. During the 2007-2013 programming period, 45.5 per cent of the EUR 3.8 billion available for Hungary from the European Agricultural Fund for Rural Development was committed to enhancing the competitiveness in the agro-food sector within the framework of the New Hungary Rural Development Programme (NHRDP). The share of financial support allocated for agro-food processing enterprises within these programmes decreased from around 25 per cent of SAPARD and 14 per cent of ARDOP to below 5 per cent of NHRDP, a clear sign of agro-food processing slipping out of the focus of agricultural policy decision makers. It shall be noted that only primary processors could benefit from any of the rural development support programmes.

Owing to its high foreign currency indebtedness, Hungary has been permanently exposed to the shifts in the confidence of its lenders in the new Millennium. As one of the most vulnerable economies in Central and Eastern Europe, it was hit hard by the global financial and economic crisis, experiencing a decline in exports as well as in domestic consumption, and fixed asset accumulation, dampened by fiscal austerity measures which resulted in the contraction

of the economy. After 2009, as a consequence of the crisis, financing became more selective and rigorous screening of the financial situation of credit applicants was introduced by the banking sector. This resulted in a drop in investments in, *inter alia*, agro-food processing. In real terms, investments in agro-food processing dropped by one third during the period 2000-2012 (Figure 4).

Figure 4. Investments in agro-food processing in Hungary, 2000-2012



* Constant 2000 prices.
Source: KSH.

Short periods of growth can be attributed to investments by a few large enterprises in meat and poultry, fruits and vegetables processing, and in pet-food production either in response to increasing consumption in the first years of the 2000s or to gain market share through acquisitions. At the end of the time period studied, investments in a few large-scale processing plants occurred, especially in pet-food production and meat processing.

The downturn of agro-food processing in Hungary is reflected in pre-tax profits of the sector falling to HUF 48.9 billion (EUR 169 million) in 2012, or by around 40 per cent in current prices over 2000, and in its debt ratio of over 60 per cent in 2012 compared to around 50 per cent in 2012.

Hungarian consumers spent, on average, 24.6 per cent of their income on food and non-alcoholic beverages and a further 3.3 per cent on alcoholic beverages and tobacco in 2012. Owing to this relatively high ratio, the level of consumer incomes still has a significant impact on the demand for food in the country. This is of crucial importance considering that most of the agro-food processing subsectors have been compelled to satisfy predominantly domestic

needs. The unprecedented spikes in agricultural commodity prices, the strong inflation of food prices and the economic crises have forced consumers to spend relatively more on food and less on luxury goods. But the volume of food product sales has been declining since 2008 and its structure has changed too. Consumer preferences have turned towards less expensive products in the past few years, lowering the margins in the food retail sector which, in turn, has had an unfavourable effect on the entire food supply chain.

Considerable changes in food consumption habits have taken place in Hungary during the past decade: the demand for meat products has dropped by around 20 per cent, and the consumption of eggs, wines, sugar and coffee has declined by a similar rate. A downward trend in the sales of alcoholic beverages and tobacco products has been observed since 2008 due to the weakening of consumer purchasing power and the rising of excise taxes. Cheap private labelled products have gained substantial popularity and according to Juhász [2011] their share in the sales volume of food retailing has approached 25-30 per cent. Although the production of private labelled products has the advantage of predictability and the continuous utilisation of processing capacities, it sharpens competition to the extreme between suppliers as they become strongly dependent on the few commercial networks which order production. The termination of supply contracts may have disastrous consequences for any agro-food processor with a high share of private labelled products in its product portfolio. Indeed, large retail chains are able to dictate prices and quality conditions, and they can regionalize their sourcing policies, covering more countries and putting suppliers under pressure.

In Hungary, tax burdens and social contributions have been relatively high, the legal framework has been unstable and, due to the slowdown of the economy, unemployment has become widespread. All these factors have contributed to the flourishing of an underground economy [Popp and Potori, 2009].

According to Lámfalusi et al. [2013] the level of the value-added tax (VAT) deserves particular attention because it is considered to be the major incentive for illegal marketing activities. The average VAT rate on food products in the EU Member States is in the range of 9 to 11 per cent. In many Member States there are preferential VAT rates for some basic food products, such as bread and milk, ranging from 0 to 5 per cent (Table 1).

Low VAT rates are explained by social considerations and the inelasticity of consumer demand for basic food products which implies that increasing the VAT rates of these would set back the demand for other goods. In Hungary, the VAT for agro-food products was raised to 27 per cent over the years and it now represents the higher end among the EU Member States. A preferential

VAT rate of 18 per cent, still relatively high, was introduced for milk and dairy and some bakery products in 2009. Then, in 2014, a preferential VAT of 5 per cent entered into force for pig meat to curb illegal sales. With the same objective and with the approval of the European Commission, the VAT has been reversed in cereals and oilseeds trade since 2012[31].

Table 1. Value Added Tax for food products in the EU Member States

Preferential VAT for all food products		Standard VAT for all food products		Both preferential and standard VAT for food products		
Country	*Preferential* VAT (%)	Country	*Normal* VAT (%)	Country	*Preferential VAT (%)*	*Normal VAT (%)*
Malta	0	Bulgaria	20	Belgium	6; 12	21
Luxemburg	3	Estonia	20	Germany	7	19
Spain	4 / 10	Lithuania	21	France	5.5 / 10	20
Italy	4 / 10	Romania	24	Ireland	0 / 4.8 / 13.5	23
Netherlands	6	Denmark	25	Cyprus	5	19
Slovenia	9.5			Latvia	12	21
Austria	10			Hungary	18*	27
Finland	14			Poland	5 / 8	23
Greece	13			Portugal	6 / 13	23
Czech	15			Slovakia	10	20
				Sweden	12	25
				United Kingdom	0	20
				Croatia	5 / 13	25

* Milk and dairy products, unflavoured; food prepared from cereals, flour, starch or milk.
Addendum: in 2014, a preferential VAT of 5 per cent was introduced for pig meat.
Source: European Commission (2014).

The lack of transparency in the Hungarian taxation system with its complexity of allowances and exemptions, and the high level of VAT corrupts above all the tax morality of smaller enterprises and forces larger processors eager to stay in competition into the 'grey zone'. For many, tax avoidance and in particular VAT fraud has become the source of viability which, according to Popp et al. [2008], seriously hinders integration, concentration, market transparency and the efficient representation and assertion of interests along the food supply chain.

Remarkably, the share of foreign capital in the sector has been declining since 2002 and although this outflow has slowed down in recent years it is still ongoing. As Jansik [2009] explains, there has been an 'international realignment of food industry FDI' as multinational agro-food processing companies regard

[31] Reverse VAT means that the seller receives only the net price of the commodity while the VAT due to the tax authority is paid by the buyer (processor or trader).

the overall market in Central and Eastern Europe as a single entity and shift their production capacity at short notice from one country to another in order to improve productivity and take advantage of lower labour and raw materials cost. This realignment occurred first in tobacco, biscuits, confectionery and soft drinks. After the enlargements of the EU in 2004 and 2007, it spread to other subsectors in the new Member States, such as dairy production. While this process favoured for example dairy production in Poland or confectionary in the Czech Republic and Slovakia, countries such as Hungary were affected adversely.

Hungarian capital could not substitute for the foreign capital withdrawn, hence the presence of foreign capital, which is typical for large-scale agro-food processing businesses in Hungary, has even slightly increased from 73.0 per cent in the share capital of enterprises with over 250 employees in 2000 to 73.2 per cent in 2012. Only around 7 per cent of the 5.1 thousand agro-food processing enterprises are entirely in foreign ownership but these generated 39.9 per cent of the sector's total sales revenue and 57.5 per cent of its total export sales revenue in 2012. The presence of foreign capital is pronounced for example in soft drinks and mineral water production, in brewing and secondary meat processing as well as in dairy and pet-food production. Multinational companies dominate especially in oilseed crushing, confectionary and snacks. In poultry, fish and game, fruits and vegetables processing, milling and baking Hungarian ownership has a majority.

Between 2000 and 2012, the number of large agro-food processing enterprises halved and this is mirrored by the volume of exported primary and secondary processed agro-food products. But large agro-food processing enterprises still retain more than half of the sector's total sales revenue (67.9 per cent in 2000 and 55.2 per cent in 2012). Their predominance is typical for example in poultry meat processing, dairy production, HFCS, starch and fuel ethanol production, sugar production and oilseeds crushing. Medium-size enterprises are more frequent in meat processing while the number of small enterprises is determining in meat processing and packing, wine production and baking. Micro-enterprises are rather common in fruits and vegetables processing, wine production and baking[32].

[32] The number of micro-enterprises with up to nine employees doubled between 2000 and 2012 exceeding 3.7 thousand in 2012. However, their share of the sector's total revenue grew from 2.9 to only 3.8 per cent during the same period. The spectacular expansion of micro-enterprises, a process perhaps less pronounced or even not experienced in other countries of the region, such as Poland, can be explained by the incentive for minimising taxes and administrative burdens to a great extent in the second half of the 2000s. The rising number of these 'backyard' businesses, in particular at the expense of medium-size processors, has been posing an increasing challenge from the aspects of, *inter alia,* traceability and food safety.

According to the statistics of National Tax and Customs Administration, the number of enterprises in agro-food processing surged from less than 3.1 thousand in 2000 to over 5.1 thousand in 2012 while the yearly average number of employees in the sector declined from 120.6 thousand to 95.2 thousand. Labour productivity (measured as output value per employee) improved, in real terms, by around 0.3 per cent per year on average during this period. The annual rate of productivity growth exceeded 5 per cent in milling and tobacco processing, followed by brewing and feed production with over 3 per cent in both cases, while fruits and vegetables processing and the production of alcoholic beverages can be listed in the third row with slightly less than 3 per cent and 2 per cent, respectively. On the other hand, labour productivity in dairy production, baking, and meat and poultry processing decreased by almost 3 per cent, more than 1 per cent and slightly less than 1 per cent annually on average between 2000 and 2012, respectively. It clearly signals the need for rationalising and restructuring in these subsectors.

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2. The Czech food and processing industry 10 years after the EU accession

2.1. Introduction

The paper is aimed at assessment of the Czech food and processing industry after the EU accession in 2004 under the conditions of the EU single market and the EU Common Agricultural Policy (CAP).

The structural and economic development of the industry under the EU conditions have been influenced by more factors (Trail et al. 1998), including:

- initial situation caused especially by how the restitution and privatisation were carried out after 1989;
- situation on the markets of agricultural commodities and food under the EU single market;
- supports under the CAP, including domestic supports;
- effectiveness of the food industry enterprises and their competitiveness against the EU countries and "third countries".

2.2. Factors influencing the development of the Czech food/processing industry after the EU accession

Measures of the government influencing the structural development of the Czech food industry

In 1989, the Czech food industry consisted of 94 state enterprises and 11 regional enterprises. Over the first years after 1989, the food industry was privatised and its structure was atomised. In 1998, there were 2548 companies and many smaller businesses (self-employed persons, cooperatives, etc.). A smaller number of companies was restituted to their original owners (e.g. mills). The main part of the state enterprises was privatised through coupon (voucher) privatisation. Only one company has still remained in the hands of the state as the national enterprise (Českobudějovický Budvar brewery). Apart from the above-mentioned changes the transformation had other effects, especially:

- the appearance of foreign direct investments (FDI) during the process of privatisation in some branches (brewery, dairy, sugar refinery, starch processing, confectioners, etc.). For about 24 entities it was a solution for the lack of capital, modern technology, innovations, etc.;
- the enlargement of the food assortment and the improvement of food packaging, also under the pressure of the retail sector with prevailing power of super- and hypermarkets;
- the tightening of domestic and foreign competition expressed in a partial reduction of overcapacities;
- the building up of a better logistics and distribution systems;
- the amendment of the food law, the abolishment of "socialist standards" of quality.

The market and other pressures were manifested in a horizontal consolidation (e.g. bakeries) or vertical integration with the typical example of AGROFERT HOLDING. This integration largely substituted the natural capital links between farms and processors which were not (successfully) implemented.

Before the EU accession the government made an inventory and classification of all food industry capacities from the point of view of their preparation for higher EU hygienic and technical standards. The Ministry of Agriculture (MOA) worked out a conception for the Czech food industry for the 2004-2013 period. The Ministry also established the Food Authority, officially linked with the European Food Safety Authority (EFSA). The Czech authority is the National contact institute for the Codex Alimentarius, as well.

Production and market of agricultural commodities

The Czech food industry is principally affected by the level of production of domestic agricultural biomass. After the EU accession the Czech farms adjusted to the new conditions (especially, almost 3 times higher income supports without obligations to produce). Consequences of the new conditions are illustrated in Table 1. There was a growth in "labour not intensive" commodities like cereals and rapeseeds, stimulated also by a growing demand for biofuels, and a sharp decline, particularly, in livestock.

Table 1. Production of agricultural commodities (annual average)

Commodity	Unit	2001-3	2009-12	Index
Cereals	000 t	6624	7398	111,7
- ethanol for fuel	*000 t*	*0*	*106*	*x*
Rapeseeds	000 t	690	1081	156,6
- fuel	*000 t*	*210*	*441*	*210,2*
Sugar beet	000 t	3619	3203	88,5
- ethanol for fuel	*000 t*	*0*	*723*	*x*
Vegetables	000 t	350	246	70,4
Fruit	000 t	362	323	89,2
Milk	mil. l	2692	2682	99,6
Beef meat	000 t lwe	198	171	86,3
Pork meat	000 t lwe	580	340	58,7
Poultry meat	000 t lwe	304	257	84,4

Source: Agricultural biomass for biogas stations (182 on farms in 2012).

The position of the farm producers on the market in relation to the domestic food industry (farm-gate prices, payment conditions, etc.) should be improved by the functioning of various producer organisations, some of them with the EU supports. Supported producer organisations are relatively successful in the sectors of fruit and vegetables. Also in dairy sector there are producer organisations, but without any supports owing to a special way of services for members, being inconsistent with the CAP requirements.

Market of food industry products

The key focus of the Czech authority was given to the food safety and quality, and to market diversification. It is important for the domestic market and for the trade.

In the field of "massive markets", the attention was given to the promotion (marketing) of foods of a higher quality, i.e. with the KLASA certification (since 2003). All EU foods, except foods with private marks of retail networks, are now eligible for the certification[33].

Regional and local (farm markets) food markets were developing step by step. It is good for small and medium-sized enterprises (SME) and for production from processing capacities on farms. These markets are, to some extent,

[33] To January 2014 the total number of foods with the KLASA certification has been 1183 from 224 producers, almost 100 % from the Czech Republic.

supported and organised by regional governments and municipalities, but a private "bottom-up" approach is also evident[34].

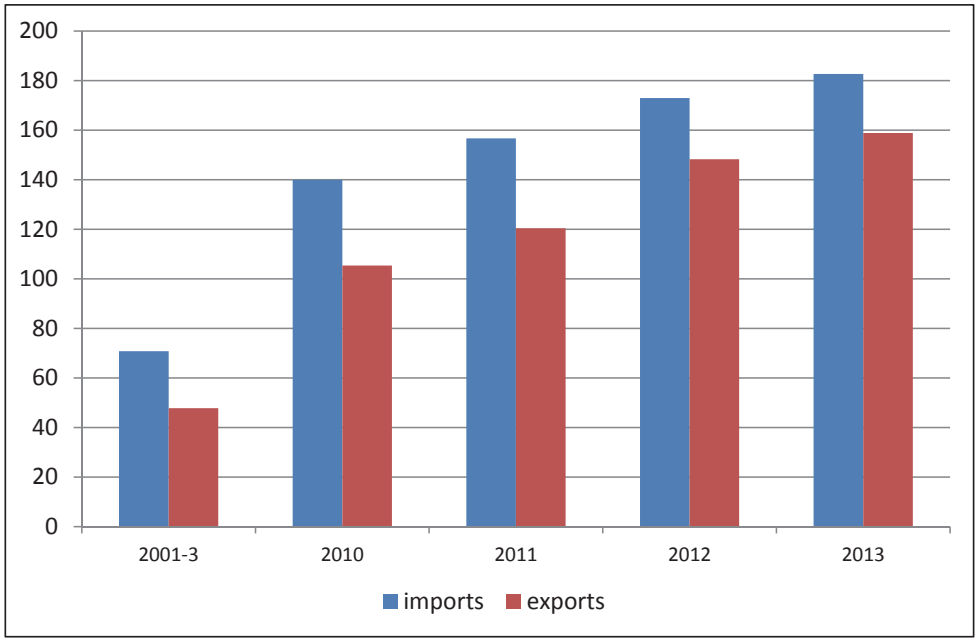
The market segment of bioproducts was also developing, but it is still marginal.

Changes in the lifestyle support demand for "Convenience Food" and for "Functional Food". A new generation of wrappings was gradually introduced, e.g. bioplastics and other active materials. However, the Czech food industry is not sufficiently involved in various private quality schemes.

The Czech food industry ČR was also trying to use the EU schemes of PGI, PDO and TSGs. The number of the EU protected marks is 33, at present, more than marks in the Slovak Republic and Hungary.

The Czech agricultural trade has increased enormously after the EU accession (see Figure 1), its turnover more than doubled, particularly exports. The main part (more than 90%) of the trade is the EU intra-trade.

Figure 1. The Czech agriculture trade (CZK billion)

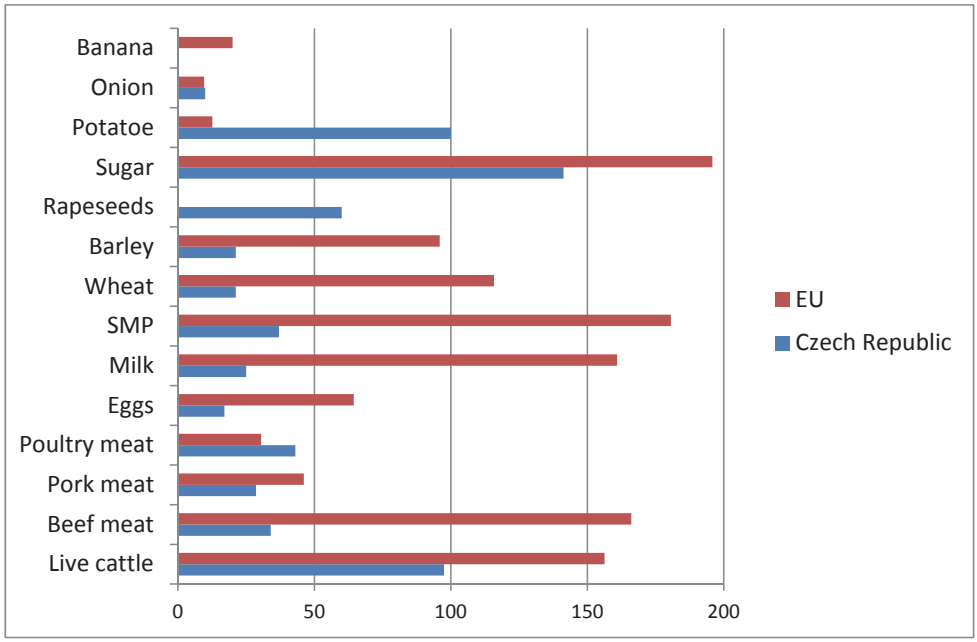


Source: Reports on the Czech agriculture.

[34] For example, under the "top-down" approach only products containing, at least, 70% of local raw materials and 100% manufactured from domestic products are classified as regional products. These products compete for the mark of "regional product" and for appraisal.

The growing turnover of trade, especially the EU intra-trade, has been also a consequence of the abolishment of tariff barriers on the EU single market. The tariff relations with third countries have changed after the EU accession as it is presented in Figure 2.

Figure 2. Changes in tariffs after the EU accession



Source: Reports on the Czech agriculture.

However, the growing importance of exports of raw materials against the growing volume of imported processed products (see Table 2) reveals domestic problems in food industry, and its lower competitiveness, particularly in primary processing.

Table 2. Commodity structure of the Czech agricultural trade

Commodities	CN	2001-3 average	2010-12 average	Index
Live animals	01	1,08	3,78	350,0
Meat and fish, including processed products	02, 03, 16	-2,56	-16,61	648,8
Milk, dairy products, eggs	04	3,11	3,01	96,8
Fruit and vegetables, including processed products	07, 08, 20	-14,08	-21,34	151,6
Cereals	10	0,38	8,82	2321,1
Grain mill products, malt, starches	11	1,58	1,82	115,2
Oilseeds	12	2,13	2,29	107,5
Oils and fats	15	-2,05	-0,12	5,9
Sugars and sweets	17	1,23	2,07	168,3
Feed	23	-5,06	-2,81	55,5

Source: Czech Statistical Office – Database of trade.

Supports for the Czech food processing industry in 1995-2012 and other main policy measures influencing the industry

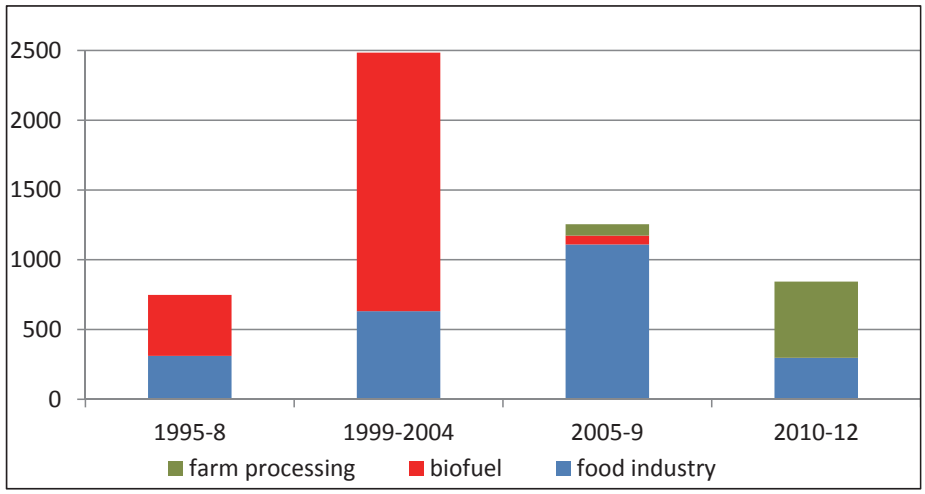
Supports for the Czech food/processing industry in 1995-2012 from the side of tax-payers[35] are presented in Figure 3. Before the EU accession the supports for the food industry were relatively low, but the supports for processing industry linked with biofuel production (utilising rapeseeds in particular) were extremely high. After the EU accession this kind of supports were not permitted and direct supports for food industry slightly increased. However, over the last 3 years the direct supports for the food industry decreased, to the benefit of supports for small processing capacities on farms, which was in line with the objectives under the Rural Development Programme 2007-13.

Nevertheless, the government was exerting an influence on the position and economy of the domestic food industry by other measures such as:

- the level and orientation of supports for farms, including supports for the utilisation of agricultural biomass for biogas station;
- the level of the VAT for food compared with the situation abroad (increase in the tax from 5% up to 15% over the last years);
- the exchange rate (e.g. depreciation in the last year from about 25 CZK/EUR to about 27 CZK/EUR.

[35] Including public expenditures on the food promotion and marketing, mentioned in Part 1.3.

Figure 3. Supports for the Czech food/processing in 1995-2012



Source: Reports on the Czech agriculture.

The government also partly supports innovation activities of the Food Industry (Technological) Platform, established after the EU accession as the private initiative of larger Czech food industry companies.

The legislative bedrock for the Czech food industry is the Food and Tobacco Law, as of 2004 harmonised with the EU legislation together with other related legislation (veterinary, phytosanitary, etc.).

At present, amendments of the Czech law are under preparation based on the EU Directive No 1169/2011 on the provision of food information for consumers.

2.3. The development of the Czech food industry after 2004

Position of the food industry in the national economy

In 2011, the share of the food industry employment in the total national employment decreased from 3,12% to about 2,48%. This 2011 share is still higher compared with the EU level (in the EU-27 – 2,15%, and in the EU-15 – 1,96%). However, the changes in the Czech Republic since 2004 of -0,64 p.p. have been much more rapid than in the EU-27 or the EU-15.

The share of the Gross Value Added (GVA) in the total national GVA has decreased since 2004 (3,27%) to 2,44% in 2012. This share is still higher than in the EU-27 (2,04%), or in the EU-15 (2,16%), respectively. The decreasing employment in the Czech food industry was manifested also in the decreasing share of the GVA in the national economy.

Structural characteristics

The largest number of food industry companies belongs to small and medium-sized enterprises. The size structure of the Czech food industry companies with more than 100 workers is presented in Table 3. The number of companies with more than 100 workers shows a downward trend. However, the ownership concentration of companies has to be compared with the technological concentration of companies. This concentration is still relatively low[36].

Table 3. Size structure of the Czech food industry companies[1)]

Number of workers	Number of companies		Index 2013/2008
	2008	2013	
100-199	143	137	95,8
200-499	98	86	87,8
500-999	22	15	68,2
1000-1999	7	6	85,7
more than 2000	3	3	100,0
Total	273	247	90,5

[1)] Companies with more than 100 workers.
Source: Czech Statistical Office.

The development of employment in the Czech food industry branches (2012 compared to 2005) is presented in Table 4[37]. The highest increase, by about 3,3%, is revealed in the branch 10.8, to the detriment particularly of branches 10.4 and 10.5.

Table 4. Employment development in the Czech food industry by branches (%)

Identification number	Branch	2005	2012	Difference (p.p.)
10.1	Meat processing	24	23,95	-0,05
10.2	Fish processing	0,63	0,87	0,24
10.3	Fruit and vegetable processing	3,31	2,89	-0,42
10.4	Plant and animal oils and fats	2,63	0,82	-1,81
10.5	Dairy	10,17	9	-1,17
10.6	Grain mill products and starch	3,34	3,18	-0,16
10.7	Bakery and confectionery products	35,48	35,95	0,47
10.8	Other food products	14,5	17,79	3,29
10.9	Feeds	5,94	5,55	-0,39
Total		100	100	x

Source: Panorama of the Czech food industry 2013.

[36] For example, one large dairy company consists of up to 10 smaller plants scattered across the Republic.
[37] The numbers of branches are according to the NACE classification.

The development in labour demands can be compared with the development of sales incomes during the same period (see Table 5).

Table 5. The share of sale incomes in the total sales of the Czech food industry (%)

Identification number	Branch	2005	2012	Difference (p.p.)
10.1	Meat processing	26,02	23,45	-2,57
10.2	Fish processing	0,72	0,62	-0,1
10.3	Fruit and vegetable processing	3,05	2,47	-0,58
10.4	Plant and animal oils and fats	7,55	4,01	-3,54
10.5	Dairy	18,59	17,13	-1,46
10.6	Grain mill products and starch	4,17	4,27	0,1
10.7	Bakery and confectionery products	14,51	13,51	-1
10.8	Other food products	17,15	20,65	3,5
10.9	Feeds	8,24	13,89	5,65
Total		100	100	x

Source: Panorama of the Czech food industry 2013.

In spite of the reduction in livestock, the feed production (10.9) showed the highest rise in the incomes (by 5,7 p.p.). On the other hand, the production of oils and fats (10.4) demonstrated the highest reduction (by 3,5 p.p.), to be in compliance with the labour reduction.

Economic development[38]

Economic development of the sector

The total value of the Czech food production has increased in 2004 and 2012[39] by 32,6% (in the Slovak Republic by 38,2%, in Hungary by 13,0%, and in Austria by 41,4%). The productivity can be expressed by Gross Value Added (GVA) related to 1000 workers (EUR million), compared with the pre-accession period, and with the EU-27. The GVA/1000 workers in the Czech food industry increased between 2004 and 2011 from EUR 18,1 million to EUR 27,7 million (by 53,3%). The increase for the EU-27 reached about 8%). The difference was caused, mainly, by the robust decrease in employment in the Czech food industry. In spite of this, the productivity of the Czech food industry represents (2011) only 58,9% of the EU-27 food industry productivity (see Table 6).

[38] The source of data: the National Accounts in EUROSTAT, with aggregate indicators at nominal prices. The data include tobacco production.
[39] Only data for some EU countries are available in EUROSTAT for 2012.

Table 6. The GVA developments in the EU food industry (EUR million)

Countries	2004	2011	difference	change %
Czech Republic	18,07	27,69	9,62	53,27
EU-27	43,56	47,04	3,47	7,97
EU-15	53,03	56,81	3,78	7,13

GVA/1000 workers at basic prices (EUR million).
Source: EUROSTAT.

The average monthly wages[40] in the Czech food industry increased between 2004 and 2011 from EUR 474 to about EUR 804 (by about 70%). In spite of this, in 2011 the level of the Czech wages represented only 45,2% of the EU-27 average (see Table 7).

Table 7. Level of wages in food industry (EURO)

Countries	2004	2011	difference	change %
Czech Republic	474	803,68	329,68	69,55
EU-27	1639,9	1777,54	137,64	8,39
EU-15	2023,47	2237,14	213,67	10,56

Average monthly wages (EUR).
Source: EUROSTAT.

After the EU accession the labour productivity and wages in the Czech food industry were growing more than in the EU-27 and the EU-15. However, because of the very low starting level in 2004, both indicators still do not, by far, reach the average EU level.

Economy of the individual food industry branches

The economy developments of individual food industry branches between 2005 and 2012 are measured by three indicators:

1. revenues from sales of own products and services (see Table 8);
2. accountancy value added[41] per worker as a reflection of the labour productivity (see Table 9);
3. Return on Revenue (ROR) as a share of economic result in the total revenues (see Table 10).

[40] The wages are defined without personal costs.
[41] The accountancy value added is calculated according to the following formula: sale margin + revenues from sales of own products and services + changes in stores of own products + activation – inputs for products and services.

Table 8. Sale incomes for own products and services (CZK million)

Identification number	Branch	2005	2012	Index 2012/2005
10.1	Meat processing	58,15	52,5	90,3
10.2	Fish processing	1,62	1,38	85,5
10.3	Fruit and vegetable processing	6,82	5,52	81
10.4	Plant and animal oils and fats	16,87	8,97	53,2
10.5	Dairy	41,54	38,35	92,3
10.6	Grain mill products and starch	9,33	9,57	102,6
10.7	Bakery and confectionery products	32,42	30,25	93,3
10.8	Other food products	38,32	46,23	120,6
10.9	Feeds	18,41	31,08	168,8
Total 10		223,49	223,87	100,2
11	Beverages	55,5	58,26	105

Source: Panorama of the Czech food industry 2013.

In total, the sales of the Czech food industry stagnated after the EU accession. It is evident from Table 8 that the production of industrial feeds (10.9) was the most dynamic branch of the Czech food industry after the EU accession (growth in sales by almost 70% by 2012). According to preliminary figures of the Czech Statistical Office, the annual growth by more than 20% is signalled for 2013 in the branch[42]. To the contrary, the production of oils and fats (10.4) dropped almost by a half after 2005.

Table 9. Labour productivity[1)] (CZK 000)

Identification number	Branch	2005	2012	Index 2012/2005
10.1	Meat processing	350	372	106,4
10.2	Fish processing	460	442	96,2
10.3	Fruit and vegetable processing	447	535	119,6
10.4	Plant and animal oils and fats	748	739	98,7
10.5	Dairy	422	660	156,6
10.6	Grain mill products and starch	502	481	95,7
10.7	Bakery and confectionery products	311	361	116,2
10.8	Other food products	614	664	108,1
10.9	Feeds	633	1340	211,7
Total 10		418	512	122,4
11	Beverages	1156	1439	123,5

[1)] Accountancy value added per 1 worker.

Source: Panorama of the Czech food industry 2013.

[42] It is mainly a consequence of the growing domestic demand for pet food and exports (in 2011 and 2013 the inter-annual index of exports was higher than 140%!). The share of pet food in the total sales in the branch 10.9 has increased by about 32% in 2011-12.

As a consequence of the high growth in sales and the reduction of labour, the highest increase (more than two times) in the labour productivity was recorded in the production of industrial feeds (10.9). On the other hand, the manufacture of grain mill products and starch (10.6) decreased by about 4%.

The accountancy value added per worker strongly varies by branches and reflects the labour productivity. Internal analyses prove that companies using supports from the Rural Development Programme (RDP) have good economic results. The supports are used, mainly, by companies up to 200 workers.

Table 10 reveals that in 2012 the highest profitability belonged to the production of beverages (branch 11 – 5,56%), followed by the production of feeds (branch 10.9 – 4,07%). The production of feeds also had the highest growth between the compared periods (3,75 p.p.).

Table 10. Return on Revenues (%)

Identification number	Branch	2008	2012	Difference (p.p.)
10.1	Meat processing	0,42	0,41	-0,02
10.2	Fish processing	-1,84	0,45	2,28
10.3	Fruit and vegetable processing	2,17	3,28	1,11
10.4	Plant and animal oils and fats	-0,36	1,38	1,74
10.5	Dairy	0,13	1,94	1,81
10.6	Grain mill products and starch	1,94	0,92	-1,02
10.7	Bakery and confectionery products	3,01	1,95	-1,06
10.8	Other food products	5,15	2,96	-2,19
10.9	Feeds	0,32	4,07	3,75
Total 10		1,62	2,14	0,52
11,00	Beverages	6,72	5,46	-1,26

Source: Czech Statistical Office.

2.4. Conclusions

- In spite of a growth in effectiveness, the productivity of the Czech food industry is still relatively low compared, especially, with the EU competitors, with harder competition on the EU single market. It is particularly a problem of primary processing (slaughterhouses, mills, dairy plants, etc.).
- It is one of the main reasons why exports of agricultural raw materials (cereals, rapeseeds, cattle, pigs, etc.) together with imports of more processed food products have been growing in the Czech agricultural trade. Nevertheless, the turnover of the Czech agricultural trade has increased 2,4 times after the EU accession, mainly as the EU intra-trade.

- Opportunities for exports to third countries are not sufficiently used.
- An adjustment to the structural changes in agricultural production has been continuing. It is linked to a growing importance of crop production and decrease in livestock production. The changes were manifested, e.g. in an increasing use of crop production for non-food production (biofuel, electricity), and in a reduction in the capacities of slaughterhouses.
- However, further structural changes and adjustments in the Czech food industry will be expected and promoted, leading to its higher effectiveness and competitiveness.
- The food market has been gradually diversified by regional products and by "short supply chains", based mainly on farm local activities. Nevertheless, their importance in total market turnover is still marginal.
- In general, after the EU accession the food market is more diversified, with larger assortment of products and better packaging, including information for consumers.
- A greater orientation of the government on the food quality and safety is typical, but it is more aimed at imported foods.

The status quo in the Czech food industry 10 years after EU gives grounds for a new position and needs, in this sector, under the CAP 2014-2020. Supports are envisaged only in Pillar 2 of the CAP, particularly under the objectives related to product, technological and organisational innovations for larger companies, and direct investment supports for processing capacities on farms. The product innovations include supports for a special nutrition (e.g. for diabetics, persons with food allergies). Nevertheless, based on experience, opening the sector for further foreign direct investments and proper management of companies could be one of the better solutions for the future.

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3. Changes in the Polish sugar market after the accession to the European Union

3.1. Introduction

The sugar sector is one of the most important sectors of the food economy, because sugar remains the primary sweetener in households and secondary food processing. The EU sugar market is one of the most comprehensively regulated markets. However, regulations strongly interfere with the laws of the market. A regulatory system based on production quotas and protectionist foreign trade policy sets framework conditions for the functioning of sector entities. The EU integration and the reform of the market regulatory system in 2006--2010 forced profound structural and ownership changes. The Polish sugar industry has transformed from a monopolistic competition into a classic oligopoly, as four producers produce a homogeneous product. The oligopoly is a market structure and a form of imperfect competition, which has a significant impact on the welfare of producers and consumers [Varian 2002]. The system of production quotas is important for agricultural holdings and sugar refineries, as it directly determines the production and processing capacity of the industry. In the context of the resource abundance theory by Hecksher-Ohlin, limiting supply may limit comparative advantages in external markets. In the multidimensional approach of competition by Porter, production quotas significantly affect the intensity of the five competitive forces that determine the strategy of sector entities to keep up with the market.

3.2. The EU sugar market regulatory system

From its beginning, the sugar sector in Poland has been subjected to protectionist policy. The Europe's first sugar beet refinery was founded by F.C. Achard in 1801 in Konary, Lower Silesia, and co-funded by King William II of Prussia [Łuczak 1981, p. 86]. In the interwar period, the sugar market in Poland was regulated by law[43]. Sugar production in a planned economy was a strategic

[43] Act of 22 July 1925 on sugar trade regulation. Journal of Laws of the Republic of Poland No. 90, item 630. Decree of the President of the Republic of Poland on the regulation of sugar

sector and public policy affected its functioning [Wykrętowicz 1997, p. 29]. Changing the political and economic system, association with the EU, the completion of the GATT/WTO Uruguay Round, ownership transformation and restructuring required that the market be regulated by law[44].

Due to EU integration, the industry was covered with the Common Agricultural Policy. EU sugar market regulations were introduced in 1967[45] and were aimed at stabilising prices, which ensure the profitability of both sugar beet cultivation and sugar production, as well as guaranteeing food security. Until 2006, these regulations underwent no major changes[46], as MacSharry reforms and Agenda 2000 involved no significant shifts [Purgał 2010, p. 213]. Major changes only affected foreign trade in 1995-2000, which were introduced under the GATT/WTO Multilateral Agreement on Agriculture. In 2000-2006, the market regulations covered the following instruments:

- Sugar production quotas: A – to supply the EU market, and B – for subsidised export or to supplement supply in the internal market. Over-quota production was out-of-quota sugar, whose possibilities of use were restrictive: exports outside the EU without refund, using for non-food purposes or including in quota production for the next season. In exceptional circumstances, it was possible to sell part of the surplus in the internal market;
- Official prices included the minimum purchase price of sugar beet and the sugar intervention price (EUR 631.9 per tonne). The minimum purchase price of resources for A quota production was EUR 47.67 per tonne, and for B quota production – EUR 32.43 per tonne. Producers paid 2% of the intervention price of A+B quota plus 37.5% of the intervention sugar price of B quota to finance export subsidies;
- Foreign trade regulations covered tariff protection (EUR 424-524 per tonne), export support (about 1.3 million tonnes; support value – EUR 497 million) and turnover monitoring (licenses). Due to high tariffs and non-tariff instruments, sugar was imported under preferential quotas[47];

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and beet cultivation of 3 December 1935, Journal of Laws of the Republic of Poland No. 85, item 548.

[44] Act of 26 August 1994 on ownership transformation in the sugar industry, Journal of Laws No. 98, item 473. Act of 20 November 1996 amending Act on sugar market regulation and ownership transformation in the sugar industry, Journal of Laws No. 125, item 724.

[45] Council Regulation No. 1009/67/EEC of 18 December 1967 on the common organisation of the market in sugar (Official Journal No. 308 of 18 December 1967).

[46] Council Regulation (EC) No. 1260/2001 of 19 June 2001 on the common organisation of the markets in the sugar sector (Official Journal L No. 178 of 30 June 2001).

[47] Duty-free quota of 1 294 thousand tonnes – African Caribbean and Pacific Group of States, and 10 thousand tonnes – India, duty-free quota of 98.1 thousand tonnes – LDCs (Least Developed Countries) – the EBA (Everything But Arms) agreement and a preferential quota for

- Domestic demand support (e.g. refunds on using sugar for non-food purposes) and market stabilisation measures (e.g. buying-in at the intervention price).

The regulations were highly effective, because there was no need for intervention and they formed a self-funding system, as support was no burden to the EU budget. However, they were criticised for high EU prices and poor price competitiveness in the international market, and also they did not encourage growers and producers to improve their economic effectiveness [Chudoba 2004, p. 32]. Subsidised EU exports increased supply and world sugar prices were low, which negatively affected the economic situation of developing countries. In 2005, the WTO challenged EU export subsidies on sugar production[48]. Taking into account the improvement of competitiveness, the position of the WTO and the interests of food market actors, the European Commission reformed the regulations. The reform was introduced in 2006-2010 and involved the following changes[49]. A and B quotas were combined and reduced to 13.3 thousand tonnes. The minimum purchase price was reduced by 40% to EUR 26.29 per tonne and the intervention price for sugar was replaced by a reference price – lower by 36% (EUR 404.4 per tonne). A fall in growers' incomes due to the lower purchase price was partially compensated by direct payments (sugar payments). Reducing production quotas forced the industry to restructure, excluding certain sugar refineries from production. In order to mitigate the social and environmental impact of the refinery closure, a restructuring fund (10% of funds were earmarked for growers) was established. These funds were derived from fees collected from producers. Regions particularly affected by the restructuring provided for additional funds (so-called aid for diversification).

The reform entailed foreign trade changes, since subsidised exports were given up and out-of-quota sugar exports decreased significantly. A production quota below domestic demand (about 19.4 million tonnes) increased the share of imports in supply. The market is still protected by high duties (EUR 319-419 per tonne) and sugar is imported under preferential quotas. Minor changes affected

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the supply of traditional refineries, 85.5 thousand tonnes of raw sugar – applies to Brazil and Cuba (duty of EUR 98 per tonne).

[48] European Communities – Export Subsidies On Sugar, AB-2005-2, WTO, 28 April 2005.

[49] Council Regulation (EC) No. 318/2006 of 20 February 2006 on the common organisation of the markets in the sugar sector (OJ L No. 51/1, 28 February 2008). Council Regulation (EC) No. 319/2006 of 20 February 2006 amending Regulation (EC) No. 1782/2003 establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers (OJ L No. 58/32, 28 February 2008). Council Regulation (EC) No. 320/2006 of 20 February 2006 establishing a temporary scheme for the restructuring of the sugar industry in the Community and amending Regulation (EC) No. 1290/2005 on the financing of the Common Agricultural Policy (OJ L No. 58/42, 28 February 2008).

mechanisms supporting market balance, as strict regulations concerning out-of--quota sugar, private storage support and the possibility of intervention purchases were maintained.

The EU sugar policy strongly interferes with market rights. Imposing administrative limits on production can be illustrated by the law of supply and demand, because a production quota is a "rigid supply curve" [Samuelson 2004, p. 128]. Lower production limits with an unchanged demand curve increase prices (quota rent). Production limits may adversely affect economic effectiveness, if they are set below the production-possibility frontier [Szajner 2012, p. 448]. Imposing limits on supply, which is the result of the five competitive forces [Porter 2006, p. 24], affects the intensity of competition in the sector. Production quotas are allocated to producers and impede new entrants' access to the sector. High duties limit imports, which are not highly competitive. The bargaining power of buyers and suppliers is small. Relations with growers are governed by cultivation contracts and the sugar oligopoly limits the range of holdings to choose consumers. Demand for "inelastic" sugar and the threat of substitutes is relatively small, despite the growing market for starch syrup and low-calorie sweeteners.

3.3. Sugar beet production

Changes in market regulations resulted in the profound restructuring of the resource base of the Polish sugar industry. In 2004-2013, the area under sugar beet decreased by about 35% to about 185 thousand ha, the share of sugar beet in the sowing structure decreased from 3% in 2006 to 1.7% in 2013. The number of growers decreased by 59% to 35 thousand (Table 1). Currently, sugar beet is cultivated in large and medium holdings in the regions of the country with the most favourable soil and climatic conditions. This situation has brought significant improvement to effectiveness, which is reflected by an increase in average root yield (up to about 61 tonnes/ha) and technological sugar yield (9.5 tonnes/ha). Such an increase in yield and its better quality compensated for the decline in cultivation area – harvest amounts to 11-11.5 million tonnes.

Table 1. Resource base of the sugar industry in Poland

Item	Unit	Value	2013		
			2004=100	Average annual growth rate*	
				Value	%
Number of growers	thousand	35.0	40.7	-5.4	-10.0
Cultivation area					
in total	thousand ha	185.0	64.7	-12.8	-5.5
of an average plantation	ha	5.6	168.2	0.2	4.8
Yield					
root yield	tonnes/ha	60.8	118.3	2.4	4.6
technological sugar yield	tonnes/ha	9.5	136.0	0.2	4.8
Harvest	million tonnes	11.2	95.0	-0.1	-0.8

* Average annual growth rate determined using the compound interest formula and the exponential trend function.

Source: Own elaboration, CSO data, National Union of Sugar Beet Growers, Sugar Industry Engineers Association.

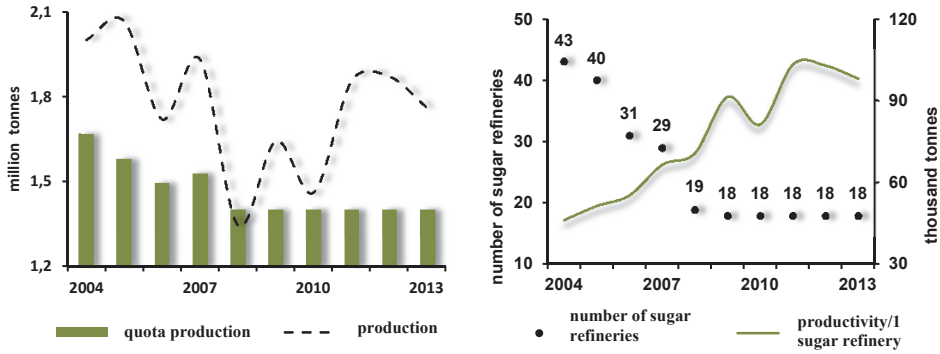
3.4. Sugar industry

Structural changes in the sugar industry advanced very slowly [Walkenhorst 1998, p. 31], [Urban 2004]. In the 2000/2001 season, three years before the EU accession and seven years after the introduction of statutory regulations, 76 sugar refineries, i.e. only two less than in a planned economy, operated in the market. The current structure of the sector is concentrated, as sugar is produced in 18 sugar refineries operating in the structures of four sugar corporations. Ownership transformations proceeded with the participation of Western sugar corporations and foreign direct investments amounted to USD 1.06 billion [Chechelski 2008, p. 87]. Three German sugar corporations own 11 sugar refineries in total and hold a market share of about 60%. Ownership changes have not been completed, as the Company owned by the State Treasury is to be privatised on the basis of employee and planter stock ownership, involving the capital integration of processing and the resource base, pursuant to the Act of 1994. The restructuring increased the concentration of production, as production per plant has doubled to 100 thousand tonnes.

Sugar production in Poland is characterised by volatility, which was a result of changes in production quotas and variable weather conditions during the growing season. Since 2008, a national production quota has been reduced by 16%, amounting to 1045.6 thousand tonnes, expressed in terms of white sugar. The production quota is below both the production capacity (about 1.9 million tonnes) and internal demand (1.65 million tonnes). In some years, output

exceeded the production quota by up to 33%, necessitating large export of out-of--quota sugar. The production limit was not reached only once in 2009 (Figure 1).

Figure 1. Sugar production in Poland



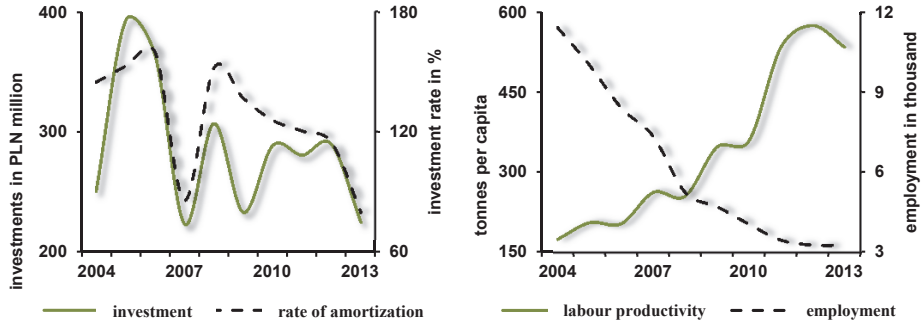
Source: Own elaboration, CSO data, Sugar Industry Engineers Association.

The restructuring process required capital expenditures, which totalled PLN 2.9 billion in 2004-2013. Sugar corporations invested in technological lines (67%), as well as buildings and dwellings (30%). Sugar refineries modernised their storage infrastructure (silos), energy systems (lower energy consumption) and environmental protection infrastructure (e.g. wastewater and dust treatment plants). In recent years, there have been changes in investments, consisting in the diversification of economic activities (e.g. cereal processing, bio-gas plants, raw sugar refining, foreign direct investments in Moldova.

The restructuring resulted in a significant reduction in employment, i.e. by 70% to 3.4 thousand in FTE. The fall in employment was accompanied by a three-and-a-half increase in labour productivity to 600 tonnes of sugar per employee (Figure 2). Labour productivity is still two times lower than in the German sugar industry[50].

[50] *Sugar market. Condition and prospects*, Institute of Agricultural and Food Economics – National Research Institute, Agricultural Market Agency, Ministry of Agriculture and Rural Development, Issue 41, p. 18, Warsaw, 2014.

Figure 2. Investments and employment in the Polish sugar industry



Source: Own elaboration, unpublished CSO data.

Structural and ownership changes resulted in improved economic effectiveness, which was measured by an index method: a ratio of effects (output, added value, profit, etc.) to inputs (labour and capital price, etc.) [Urban 2008]. Economic effectiveness can be assessed using parametric methods, which are based on production functions [Gruszczyński 2004]. The effectiveness of the Polish sugar industry was studied based on the Cobb-Douglas production function, whose equation was estimated using a nonlinear estimation method and statistical data of 2002-2013 (1-1).

$$Q_{f(K,L)} = a \cdot K^{\alpha} \cdot L^{\beta} \qquad Q_{f(K,L)} = 2{,}802 \cdot K^{0{,}370} \cdot L^{0{,}044},\ R^2{=}0{,}73 \tag{1-1}$$

where:
$Q_{f(K,L)}$ – income from sales and equivalent income [PLN billion]
K – total capital [PLN billion]
L – labour price [PLN billion]

Partial derivatives of the function indicate the marginal productivity of factors, which is positive and diminishing. The diminishing marginal productivity of inputs is a property of the function, which takes into account the law of diminishing marginal returns. Marginal productivity is an increase in output resulting from the addition of one unit of input, holding all other inputs constant (*ceteris paribus*). An analysis revealed that the marginal productivity of capital is greater than the marginal productivity of labour (1-2).

$$\partial Q^{K}_{f(K,L)} = 1{,}038 \cdot K^{-0{,}630} \cdot L^{0{,}44} \qquad \partial Q^{L}_{f(K,L)} = 0{,}092 \cdot K^{0{,}370} \cdot L^{-0{,}956} \tag{1-2}$$

The partial elasticity of the function with respect to the factor is a relative increase in output, with factor input increased by 1% (*ceteris paribus*). Elasticity is a ratio of increment of the function to increment of input and is constant in the Cobb-Douglas function. Studies have shown that the output elasticity of capital α is higher than the output elasticity of labour *ß* (1-3). The absolute elasticity of the function is the sum of partial elasticities and reflects economies of scale. If a *λ*-fold increase in inputs corresponds to a λ-fold increase in the value of the function, we can observe zero economies of scale (α+ß=1). Depending on whether an increase in output is larger or smaller, there are positive or negative economies of scale. The sugar industry is characterised by diminishing economies of scale, which indicates that market balance can only occur in the short term [Łyszkiewicz 2000]. In the long run, the sector cannot function effectively with diminishing effects of scale.

(1-3)

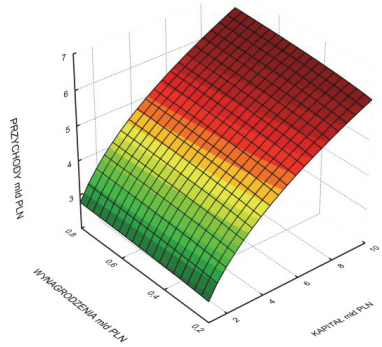
$$\varepsilon^{K}_{f(K,L)} = \frac{\partial Q^{K}_{f(K,L)}}{Q_{f(K,L)}} \cdot K = \alpha = 0{,}37 \qquad \varepsilon^{L}_{f(K,L)} = \frac{\partial Q^{L}_{f(K,L)}}{Q_{f(K,L)}} \cdot L = \beta = 0{,}044$$

The marginal rate of substitution of one factor by another factor enables an economic assessment of input substitution. The marginal rate of substitution is a change in input that should be made to keep output unchanged, when the second factor input changes by one unit. The rate of substitution is a ratio between the partial derivatives of the production function. The substitution of the factors of production is associated with the ratio between employment and capital stock, which is the labour-capital ratio (1-4). In accordance with the properties of the Cobb-Douglas function, the more capital per unit of labour (higher labour--capital ratio), the easier replacement of capital inputs with labour (Figure 3).

(1-4)

$$\delta^{K}_{f(K,L)} = \frac{\partial Q^{K}_{f(K,L)}}{\partial Q^{L}_{f(K,L)}} \cdot \frac{K}{L} = \frac{\alpha}{\beta} = 8{,}4 \qquad \delta^{L}_{f(K,L)} = \frac{1}{\delta^{K}_{f(K,L)}} = \cdot \frac{\beta}{\alpha} = 0{,}12$$

Figure 3. Cobb-Douglas production function of the sugar industry



Source: Own calculations, unpublished CSO data.

3.5. Sugar consumption in Poland

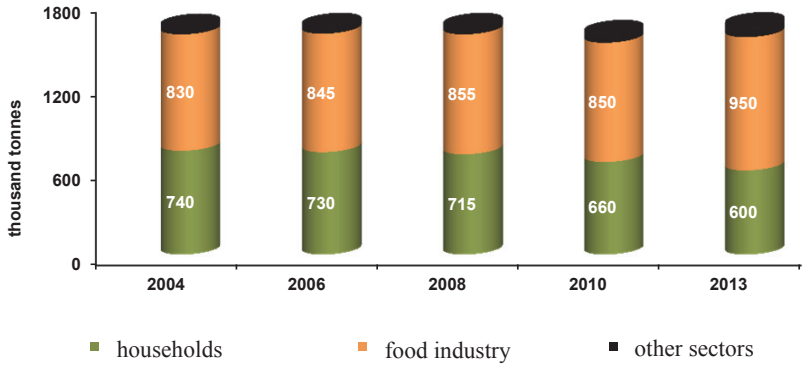
Demand for sugar in Poland varies slightly, as it has been 1 610-1 630 thousand tonnes since the EU accession. The pattern of consumption significantly changed, as consumption in households decreased, contrary to consumption in the food industry, which recorded an increase (Figure 4). Sugar consumption in the other sectors of the economy (e.g. beekeeping, pharmaceutical and chemical industries) is small (about 60 thousand tonnes).

The decrease in sugar consumption in households results from several factors. Firstly, the pattern of consumption changes, as more and more sugar is consumed in the form of food (e.g. sweets, soft drinks, fruit products). Consequently, in accordance with balance sheet data, sugar consumption in the country remains stable and reaches about 40 kg *per capita*. The observed trends are typical of the global economy and are referred to as westernisation of diets [Pingali 2007]. This is confirmed by large differences in consumption in different types of households. Households of farmers and pensioners, who are keeping the tradition of homemade food (e.g. baking cakes, fruit processing), have the highest consumption of "pure sugar". Secondly, the fall in the consumption of pure sugar results from healthy diets, because its consumption is considered to cause many civilisation diseases. Sugar is an inferior good and its consumption is characterised by very low price [Cubbin 1973] and income elasticity [Kwasek 2009]. Therefore, the growing income of domestic consumers will not increase demand for sugar.

Higher sugar consumption in the food industry results from changes in the structure of domestic demand and growing Polish food exports[51]. Secondary food processing is of great economic importance, because it enables food sector actors to benefit from added value and economies of scale.

Stable and inelastic domestic demand and the increasing demand of the food industry are very favourable for the sugar industry. Food industry plants are large purchasers, and thus transaction costs are lower, having a positive impact on the profitability of sales.

Figure 4. Sugar consumption in Poland



Source: Own calculations, CSO data.

3.6. Foreign trade

Polish foreign sugar trade is characterised by a surplus of exports over imports, as production exceeds demand in the internal market. However, the reform of market regulation resulted in significant changes. First of all, self-sufficiency[52] decreased, because the production quota was reduced and the share of imports in supply increased (so-called import market penetration[53]). The production quota is lower than domestic consumption by about 200-250 thousand tonnes and out-of-quota sugar may be introduced to the internal market only in exceptional situations. Consequently, Poland is forced to import 200-250 thousand tonnes regardless of output and, at the same time, export out-of-quota sugar. The increase in imports results also from refining raw sugar, which has

[51] *Foreign agri-food trade. Condition and prospects*, IAFE-NRI, Agricultural Market Agency, Ministry of Agriculture and Rural Development, Issue 39, Warsaw, 2014.
[52] Self-sufficiency is defined as a ratio of output to demand in the internal market.
[53] Import penetration is a ratio of imports to output minus the balance of foreign trade.

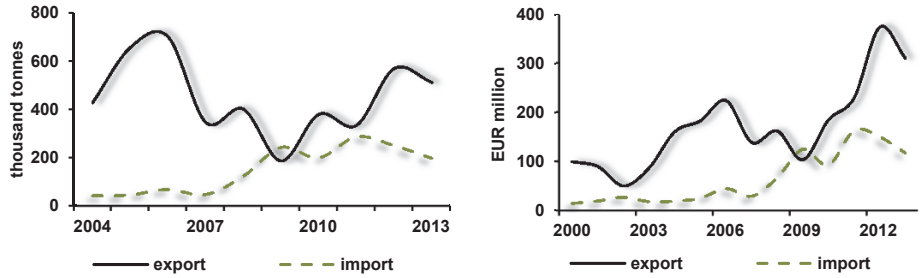
been allowed in new Member States since 2010[54]. Refining allows better use of the factors of production between campaigns, but it is also in competition with sugar beet processing. Since the EU accession, the rate of self-sufficiency has decreased to 103.6%, as opposed to the rate of import penetration which has increased to 11.9%. This lower self-sufficiency also decreased the export specialisation of production[55] to 18.2% [Szajner, Garay 2014].

High production of out-of-quota sugar meant that the sugar sector remained a net exporter. The slightly negative balance of foreign trade was reported only in 2009, as a result of lower production from the production quota (Figure 5). Foreign trade changes adversely affected the international competitiveness of the sugar industry, which was measured by the revealed comparative advantage index (RCA_i), the intensity of the intra-industry trade index (IIT_i) and the Lafay's index (LF_i) [Szczepaniak 2013].

The domestic sugar market is increasingly linked to the EU and world markets. A large share of German corporations in the sugar industry affects the functioning of the market. Furthermore, out-of-quota sugar can be exported by companies registered in other EU Member States (principle of equivalence)[56]. World market prices determine the value of exports and imports, as well as the profitability of commercial transactions. In recent years, prices of agricultural commodities and food products have shown a strong upward trend, but also high volatility [Mitchell 2008], [Szajner 2013]. The increase in world market prices resulted in greater dynamism of the value of foreign trade than its volume. The FAO index of world sugar prices increased from 100.6 in 2004 to 368.9 in 2011, to fall back to 251 in 2013[57].

[54] Commission Regulation (EC) No. 828/2009 of 10 September 2009 laying down detailed rules of application for the marketing years 2009/2010 to 2014/2015 for the import and refining of sugar products of tariff heading 1701 under preferential agreements.
[55] Export specialisation of production is measured by the share of exports in production.
[56] Council Regulation (EC) No. 951/2006 of 30 June 2006 laying down detailed rules for the implementation of Council Regulation (EC) No. 318/2006 as regards trade with third countries in the sugar sector.
[57] FAO Food Price Index, http://www.fao.org/worldfoodsituation/foodpricesindex/en/, 17 September 2014.

Figure 5. Foreign trade in sugar in Poland



Source: Own calculations, Analytical Centre of Customs Administration data.

3.7. Conclusion

The Polish sugar industry underwent in-depth restructuring and modernisation. The EU accession and adoption of the EU regulatory system, which was reformed in 2006-2010, played an important role in this regard. Structural and ownership changes in the industry made the domestic sugar market evolve from a monopolistic competition into an oligopoly. The number of sugar refineries was reduced to 18, which operate in the structures of four corporations. Due to ownership transformations and foreign direct investments of large transnational sugar companies, the domestic market share of German corporations reached about 60%. Privatisation has not been completed yet, as the largest corporation will be privatised on the basis of employee and planter stock ownership. The restructuring resulted in an increase in the concentration of the industry, because the sector's processing capacity slightly decreased despite excluding numerous sugar refineries from production.

The modernisation of plants increased productivity of factors and improved economic effectiveness. The market structure, better economic climate, favourable price relations and, above all, increased economic effectiveness helped improve financial performance in 2009-2013[58]. The sugar industry in Poland diversifies economic activities.

Sugar industry transformations resulted in significant changes in the cultivation of sugar beet, which was concentrated in the regions of the country with the most favourable soil and climatic conditions. The area of cultivation and the number of growers decreased. The decline in cultivation area was partly compensated by better cultivation effectiveness, which reflects an increase in yields.

[58] *Sugar market. Condition and prospects*, Institute of Agricultural and Food Economics – National Research Institute, Agricultural Market Agency, Ministry of Agriculture and Rural Development, Issue 41, p. 21, Warsaw, 2014.

The future of sugar production in the EU, including Poland, will depend on WTO negotiations. If the liberalisation of world food trade results in lower duties, competition from sugar cane imports will increase and production will be maintained only in the most competitive regions of the EU.

How elimination of production quotas in 2017 will affect the market remains uncertain, because there are no specific out-of-quota sugar arrangements. Sugar production covers the demand of the domestic market, thus making imports unnecessary. Note, however, that the EU has provided developing countries with economically preferential quotas and imports will be carried out. WTO negotiations under the Doha Round have not been concluded, but if they result in further trade liberalisation, we can expect an increase in competition from imports.

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4. Potential effects of euro adoption on the Polish foreign agri-food trade

4.1. Introduction

In the last decade, the balance of Polish agri-food trade, mainly with the EU Member States, experienced a significant improvement. In 1995-2013, the Polish agri-food sector enjoyed a very dynamic increase in foreign trade, mainly due to the development of exports, which increased from EUR 2 billion to EUR 18 billion in the period concerned. Imports grew less rapidly from EUR 3 billion to EUR 14 billion. The trade balance was negative until 2002, after which, especially following Poland's accession to the European Union, it turned towards positive. In 2013, Poland reported a surplus in agri-food trade at a level of EUR 4 billion. The global financial crisis and the resulting economic crisis, which affected many countries, caused a slight decrease in agri-food exports and imports in 2009, but in subsequent years the rates of both import and export growths recovered to their pre-2008 levels, reaching almost 40% a year. In 2013, exports amounted to EUR 18.7 billion, while imports reached EUR 13.7 billion. In 1995-2013, agri-food trade accounted for 8-13% of the Polish exports, and 6-10% of the Polish imports. In the first half of 2013, this was 12.5% and 9.2%, respectively. It can, therefore, be concluded that the agri-food sector plays an important role in the Polish trade with foreign countries. Notably, agri-food products are mainly imported from and exported to the EU Member States. In the first half of 2013, agri-food exports to the Member States accounted for 77.0% of the total exports in this product group, while agri-food imports from these countries amounted to 68.3% of total imports in this group [Seremak-Bulge and Łopaciuk 2011, Łopaciuk 2013].

In this context, the question arises as to the underlying reasons of such a dynamic growth in agri-food exports and the related improvement in the trade balance. The potential effects of euro adoption on the Polish foreign agri-food trade, especially with the EU Member States, are a particularly interesting research problem. The studies undertaken are mainly motivated by quite a common opinion that big part of the Polish success in foreign agri-food trade can be attributed to a floating exchange rate regime, which was formally introduced in

Poland in 2000. With this in mind, the study attempts to determine the impact of zloty exchange rate volatility on the dynamics of this trade. Analysis covered data from 2004-2013, i.e. as of Poland's accession to the EU. Econometric methods were used to prove that exchange rate fluctuations (appreciation, depreciation) played an important role in shaping of the Polish agri-food trade. Furthermore, the relative prices of selected agri-food products in Poland and the European Union were compared to anticipate the possible effects of euro adoption at three different possible conversion rates (similar to recently observed market levels, well below and well above these levels) on the Polish agri-food exports.

The specific objectives of the study are as follows:

- present determinants of euro adoption in Poland;
- present changes in Polish foreign agri-food trade, as well as zloty exchange rate fluctuations after the EU accession;
- present changes in the relative prices of selected agri-food products against exchange rate fluctuations;
- estimate the impact of exchange rate fluctuations on the dynamics of agri--food trade, especially with eurozone countries;
- attempt to assess the impact of euro adoption on foreign agri-food trade.

4.2. Determinants of euro adoption in Poland

The Economic and Monetary Union (EMU), being one of the elements of cooperation within the European Union (EU), was established by the Treaty of Maastricht in December 1991. Its primary task is to create a common European currency, the euro, and move monetary policy into the Community sphere. The EMU includes all EU Member States, however, the third stage – meaning *de facto* joining of the eurozone, involved 18 of them. The Treaty on European Union was signed in Maastricht in 1992. It provided for the introduction of the Union in three stages. The first stage consisted in establishing the single internal market, intensifying cooperation between central banks and reinforcing coordination of economic policies from 1 July 1990. The second stage commenced on 1 January 1994 and involved creating basic institutions and organisational structures, establishing the European Monetary Institute, meeting convergence criteria, the irrevocable fixing of the exchange rates of national currencies to the euro and carrying out preparatory work for the third stage. With effect from 1 January 1999, as part of the third stage, the exchange rates of national currencies to the euro were irrevocably fixed, the euro was introduced into non-cash circulation and the European System of Central Banks started to shape monetary policy.

Furthermore, a new exchange rate mechanism (ERM II) was developed, to protect and stabilise non-euro European currencies [Ministry of Foreign Affairs 2011].

Poland joined the EMU in January 2004, but a derogation applies to Poland which is to be abrogated upon the fulfilment of the convergence criteria. Moreover, as a new Member State, Poland has committed itself to join the ERM II; however, it has failed to do so in fear of limiting its freedom of determining expenditures in the Budget Act, as a result of fixing the national currency against the euro. Table 1 presents the current state of meeting the convergence criteria by Poland. In June 2014, Poland did not meet three of them: fiscal, exchange rate and legal criteria.

In general, the adequacy and relevance of meeting the convergence criteria, as well as the effects of Poland's access to and participation in the ERM II remain under discussion. The main issues raised in this discussion are the costs and benefits of euro adoption in Poland. This subject is mainly dealt with at the macroeconomic level, which is understandable, since this is the only level of aggregation on which the economic rationality of such a step and its importance for the Polish economy as a whole can be assessed.

Euro adoption is expected to bring the following benefits: lower transaction costs associated with the single currency, no exchange rate risk, lower interest rates, lower risk of a financial crisis, greater transparency and comparability of prices, and greater macroeconomic stability. However, its costs are as follows: no autonomy in monetary policy, inflation risk, credit boom risk, and asymmetric distribution of effects of replacing the national currency. Nevertheless, the general feeling is that the overall balance of costs and benefits of joining the eurozone will be very positive for the Polish economy. Simulations carried out by the National Bank of Poland indicate that the Polish exports should grow at least in the first few years after euro adoption, which is supposed to contribute significantly to economic growth.

This expected positive impact on trade is largely confirmed by the results of numerous studies, mainly based on gravity models of international trade, which also indicate the positive impact of the single currency or monetary unions on international trade [e.g. Rose 2000, Frankel and Rose 2002, Glick and Rose 2002]. On the other hand, the literature lacks in-depth analyses indicating the diversity of effects of euro adoption on the economies of different countries and their sectors.

Table 1. Assessment of compliance with the convergence criteria by Poland in April 2014

Criterion	Description	Criterion compliance
Price stability (inflation)	The average inflation rate in the country concerned must not be higher than the average annual inflation rates of the three lowest-inflation Member States by more than 1.5 percentage points.	**YES** Poland's average annual HICP inflation rate was 0.6%, which is below the reference value of 1.7%
Fiscal	No Member State may be subject to the excessive deficit procedure, which is applied when the general government deficit of the country concerned in relation to GDP exceeds 3% or government debt exceeds 60%.	**NO** Poland is subject to Council Decision on excessive deficit. In 2013, its general government deficit amounted to 4.3% of GDP, while its public debt-to-GDP ratio was 57%.
Exchange rate	The country concerned must participate in the ERM II for at least two years, during which the exchange rate of the national currency must be kept within a fluctuation margin of +/-15% around a fixed central parity and must not be subject to strong tensions, in particular, must not be devalued against the euro.	**NO** Poland's exchange rate regime is floating and Poland does not participate in the ERM II, in which arbitrary currency devaluation against the euro is prohibited.
Interest rates	During the year preceding the assessment of compliance with the criterion, the average long-term interest rate must not be higher than the average of the corresponding rates of the three lowest-inflation Member States by more than 2 percentage points.	**YES** From May 2013 to April 2014, Poland's average long-term interest rate was 4.2%, which is lower than the reference rate of 6.2%.
Legal convergence	The compatibility of national legislation with Articles 130 and 131 of the Treaty on European Union and the Statute of the European System of Central Banks and the Statute of the European Central Bank.	**NO** The Polish law fails to meet all the requirements for central bank independence, confidentiality, the monetary financing prohibition and legal integration into the eurozone.

Source: Own elaboration based on [Ministry of Foreign Affairs 2011, European Central Bank 2014].

Theoretically, different sectors may benefit differently from euro adoption due to technological and market structure differences, as well as differences in national specialisation. Pappalardo and Vicarelli [2012] suggest that this differentiation may lead to the emergence of both winners and losers in the export

competition. This issue has also been addressed in some other papers [e.g. de Nadris and Vocarelli 2003, Baldwin et al. 2005, de Nardis et al. 2008].

4.3. Zloty exchange rate volatility in relation to the results of the Polish agri-food trade

In accordance with the basic theory of international trade, the exchange rate has a crucial impact on the volume of national trade, since the depreciation of the national currency may increase exports and decrease imports, while its appreciation may decrease exports and increase imports. Following this fundamental theoretical premise, attempts were made to detect any relationship between Polish zloty exchange rate fluctuations, and export and import dynamics using the Johansen cointegration test and the VECM [cf. Kusideł 2000, Peseran et al. 2001, Huchet-Bourdon and Korinek 2011]. The balance of Polish foreign agri-food trade with eurozone countries (EUR million) was the dependent variable, while the explanatory variables were as follows:

- real PLN/EUR exchange rate;
- volatility of the nominal PLN/EUR exchange rate measured by the standard deviation of the last 12 months;
- demand for agri-food products in the eurozone and Poland reflected by the respective indices of wholesale and retail food trade as proxies (2010=100).

The dependent variable was seasonally adjusted using the X12-ARIMA procedure [cf. X-12-ARIMA 2011]. What is more, all variables were expressed in logarithmic form. Exchange rate volatility, as well as domestic and foreign demand were considered as the explanatory variables, since they are the main – in addition to the exchange rate – determinants of the volume of agri-food exports and imports.

Certainly, the importance of domestic demand for imported goods and of foreign demand for exported domestic goods is crucial. Following the theory, the devaluation[59] of the national currency increases the volume of exports through the increase in demand for a good, whose foreign currency price falls. At the same time, the volume of imports decreases, as does domestic demand for import goods, whose national currency prices increase. However, this intuitively obvious effect of devaluation of the national currency supposes that the elasticity of domestic and foreign demand for imported goods is relatively high which is not always the case. Bear in mind the Marshall-Lerner condition, which states

[59] The situation in the case of depreciation is s. At the same time, revaluation (appreciation) brings the opposite effect.

that the devaluation of the national currency will improve the trade balance if the sum of the elasticities of domestic and foreign demand for imports is greater than 1. In this context, it is also recommended to mention the so-called *J*-curve effect. As is known, supply and demand price adjustments do not occur instantaneously. In particular, this applies to international trade, where the share of long-term contracts is particularly high. In the short run, supply and demand curves remain price-inelastic, resulting in the initial deterioration in the trade balance by the devaluation of the national currency.

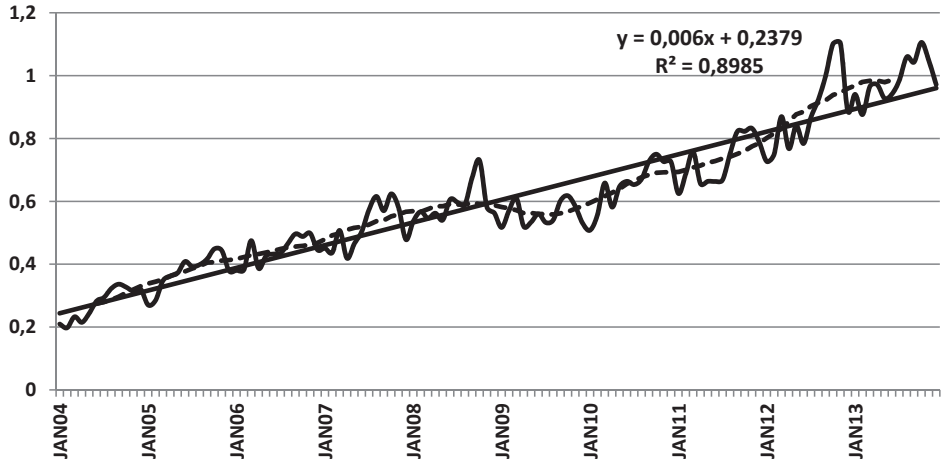
On the other hand, in the case of studies on the directions of changes in the volume of international trade, impact of changes in the total volume of domestic and foreign demand is also very important, as it determines the volume of demand for internationally traded goods. It should be noted that an increase in the national economic climate is accompanied by deterioration in the trade balance. Firstly, this is because of an increase in domestic demand which cannot be met by a growth in domestic supply; secondly, because of an increase in inflation processes weakening the national currency. Thus, an econometric analysis used a variable indicating demand for all agri-food products in the eurozone and Poland, not only for those traded.

The impact of exchange rate volatility on exports and imports is much more difficult to assess, both theoretically and based on the results of studies. Theoretical papers address both mechanisms that may contribute to worsening the trade balance by increasing the exchange rate risk (risk aversion, the cost of risk management in financial markets), as well as those whose impact is opposite (higher risk means higher expected earnings of companies with extremely strong risk aversion, which assume the worst possible exchange rate scenario). Similarly, in the case of the results of various empirical studies, an impact assessment of an increase in exchange rate risk remains unclear.

Figure 1 presents trends in the value of the Polish agri-food exports to world markets in 2004-2013. They exhibited a very strong upward trend explaining almost 90% of their volatility. The situation is similar when considering the Polish agri-food exports to the EU Member States[60], which is understandable due to the geographical proximity of the EU markets and free access to the EU single market after Poland's accession to the European Union in 2004.

[60] In this case, the trend explained 87% of volatility in the value of exports.

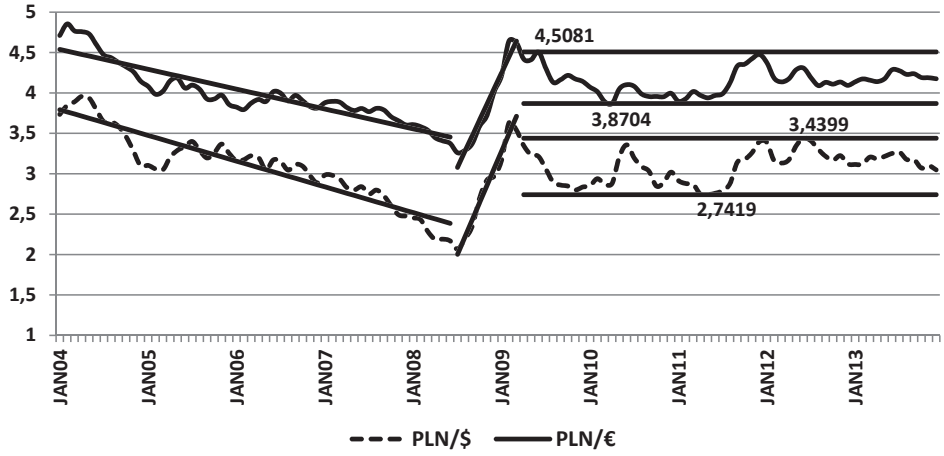
Figure 1. Polish agri-food exports in 2004-2013 (EUR billion)



Source: Own elaboration based on CAAC data.

On the other hand, Figure 2 shows that trends in PLN/EUR and PLN/EUR exchange rates in the same period were extremely changeable and highly volatile.

Figure 2. PLN/USD and PLN/EUR exchange rates in 2004-2013



Source: Own elaboration based on NBP data.

Until July 2008, the Polish zloty appreciated systematically against the euro (below 3.5), then it rapidly started to depreciate reaching 4.51 in June 2009. Since that moment, the trend has become more or less horizontal. Distribution of

the logarithmic rate of returns appeared to be asymmetric and leptokurtic and did not meet the tests for normality. The PLN/USD exchange rate followed an similar pattern.

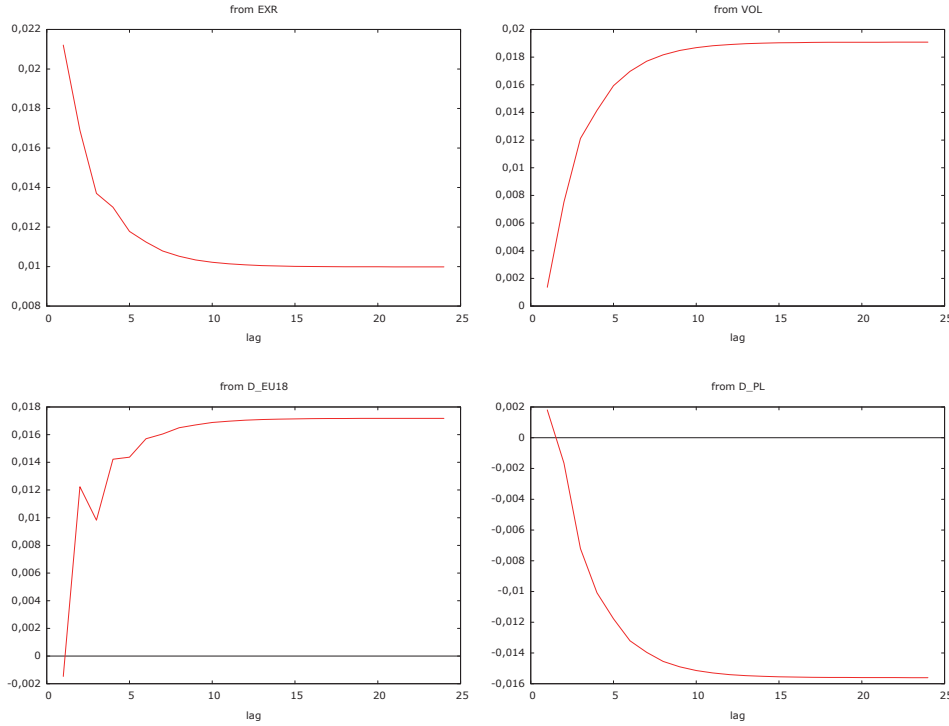
Next, attempts were made to identify a relationship between the volume of trade (trade balance) and exchange rate fluctuations using econometric analyses. Testing the stationarity of variables (balance, exchange rate, exchange rate volatility, and demand in Poland and the eurozone) showed that virtually all the analysed variables were integrated to the 1st order, which means that their first growths can be considered stationary. In the case of the time series of the trade balance, stationarity test results were inconclusive. It can be assumed that we are dealing with fractional integration (d=0.75).

The Johansen trace test indicated one cointegrating vector[61], which means the existence of a long-term relationship between the variables analysed. Hence, the next step involved estimating the VECM. Based on the Akaike information criterion, the number of the VECM delays was set at one. Apart from the lack of normality of distribution of residues, the model meets the required conditions. In the estimated VECM, all variables – except nominal exchange rate volatility – were statistically significant regarding their adjustments to long run equilibrium. Figure 3 presents the reactions of the foreign trade balance to impulses from the explanatory variables included.

As expected, it turns out that the recovery of the economic climate in eurozone countries improves the trade balance, while a growth in domestic demand deteriorates it. Furthermore, impulse response functions suggest that the depreciation of the Polish currency against the euro has some short-term positive impact on the agri-food trade balance, which afterwards weakens. This may be associated with higher import costs resulting from currency depreciation or higher agricultural commodity prices due to transmission from world markets. The positive impact of currency depreciation on the balance is related to the fact that quantitative effects outweigh price effects, i.e. foreign currency exports (and the balance) increase when the effect of the increased volume of exported goods outweighs the effect of the drop in their prices, as a result of currency devaluation. The price elasticity of foreign and domestic demand has a significant impact on this process.

[61] The null hypothesis of no cointegration was rejected at $p<0.01$.

Figure 3. Reaction of the Polish foreign trade balance with eurozone countries to impulses from the explanatory variables included*



* EXR – real exchange rate, VOL – exchange rate volatility, D_EU18 and D_PL – demand for agri-food products in the eurozone and Poland, respectively.
Source: Own elaboration.

Moreover, calculation findings reveal the positive impact of exchange rate volatility on the trade balance. This may prove a low level of risk aversion among domestic exporters. However, the forecast error variance decomposition shows that real exchange rate fluctuations explain only about 4% of the volatility of the agri-food foreign trade balance in the coming 2 years. PLN/EUR exchange rate volatility can be of slightly larger significance (about 9%).

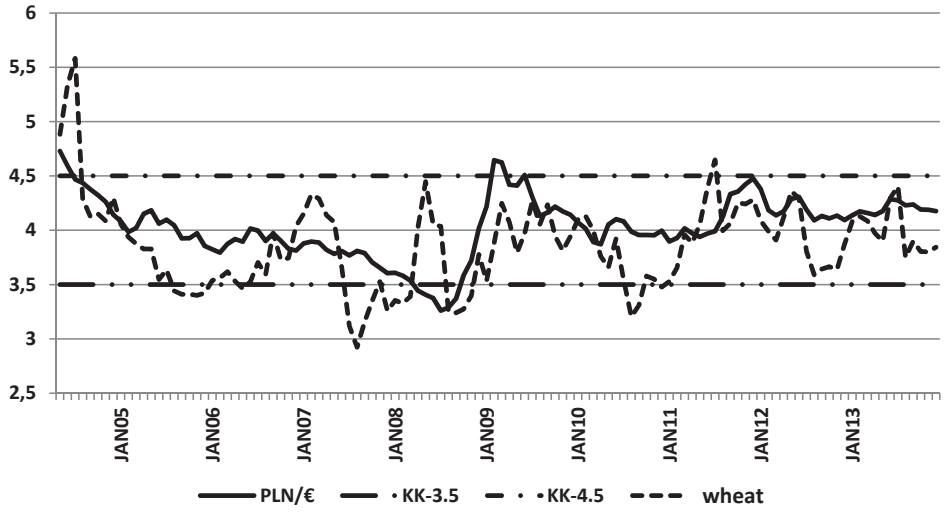
Nevertheless, it should be noted that the results of analyses carried out on selected products, regarding the impact of exchange rate and its volatility on the trade balance, differed quite significantly depending on the market concerned.

4.4. Relative prices of selected agri-food products against potential zloty-to-euro conversion rates

With reference to the Law of One Price (LOP) and the theory of Purchasing Power Parity[62] (PPP), the levels and fluctuations of relative prices of selected agri-food products in Poland and on the EU markets in the post-accession period, i.e. in 2004-2013, were analysed to see how these prices relate to market-determined exchange rate levels and fluctuations. The main focus was on identifying the potential cases of undervaluation or overvaluation of the Polish currency, as well as expected price adjustments considering different potential zloty-to-euro conversion rates within 3.5-4.5. The conclusions of this analysis may be relevant for such a conversion rate, beneficial for the competitiveness of Polish agri-food trade, when joining the eurozone.

Comparing relative prices of products, representative to Polish agri-food trade, such as wheat, pork, poultry and butter, to PLN-EUR exchange rate fluctuations was much more revealing in terms of explaining the Polish agri-food dynamics, than PLN exchange rate volatility (Figures 4-7).

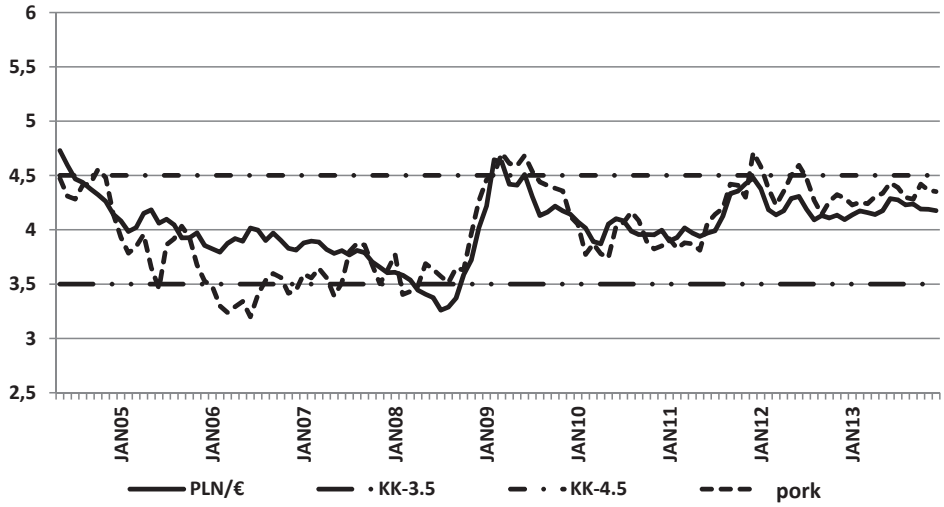
Figure 4. Relative price of wheat in relation to potential PLN conversion rates *(Polish: Kursy Konwersji, KK)*



Source: Own elaboration based on NBP and EC data.

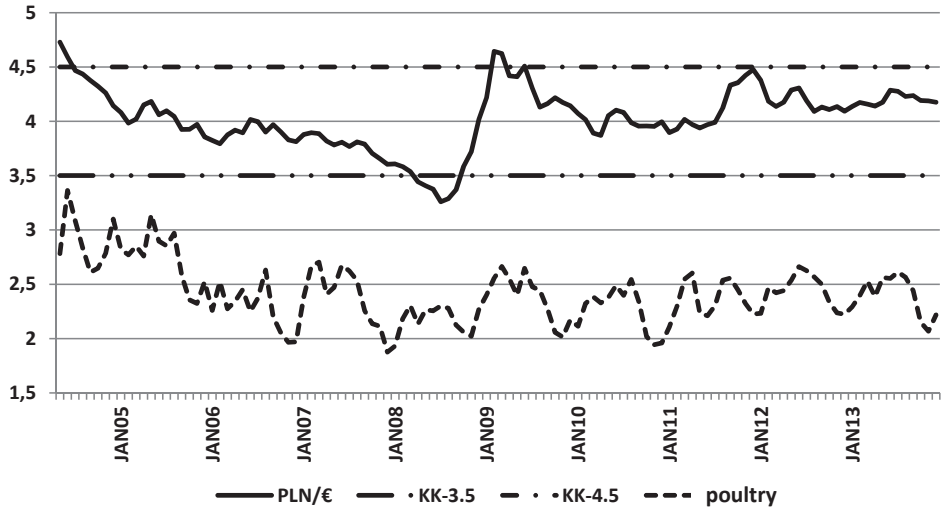
[62] The theory assuming that exchange rate fluctuations in the period concerned are determined by price level fluctuations (inflation rates) in the countries at issue.

Figure 5. Relative price of pork in relation to potential PLN conversion rates (KK)



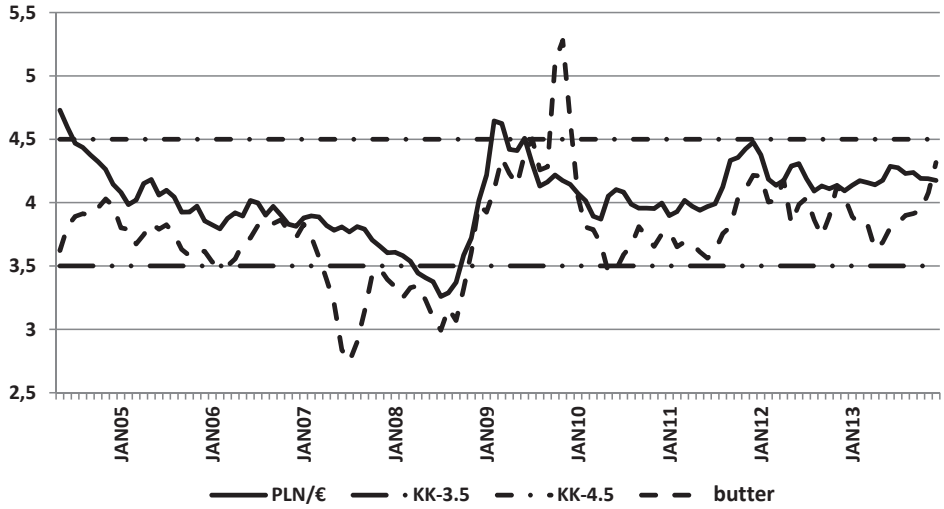
Source: Own elaboration based on NBP and EC data.

Figure 6. Relative price of poultry in relation to potential PLN conversion rates (KK)



Source: Own elaboration based on NBP and EC data.

Figure 7. Relative price of butter in relation to potential PLN conversion rates (KK)



Source: Own elaboration based on NBP and EC data.

A relative price may stimulate or dampen exports. An undervalued currency acts as an implicit export subsidy, whereas an overvalued currency – as an implicit export tax [Shuch, 1974]. Therefore, considering monthly observations in the analysed period, the share of relative undervaluation was calculated for each agri-food product taken into account, assuming that the total number of observations is 100%. They were as follows:

- wheat – PLN undervaluation in 78.4% of cases in the period concerned (mostly slight);
- pork – PLN undervaluation in 45.7% of cases in the period concerned (mostly undervalued until 2008, later – overvalued);
- poultry – PLN undervaluation in the entire period concerned (zloty exchange rate highly undervalued);
- butter – PLN undervaluation in 93.1% of cases in the period concerned.

Assuming hypothetically, based on historical PLN/EUR exchange rate volatility, that the conversion rate of the Polish currency, if the euro is adopted, will be 3.5-4.5, we can attempt to identify those branches of the Polish agri-food sector, which would face potential adjustments due to euro adoption necessary to maintain their export competitiveness. It seems that a need for such adjustments is much less likely when it comes to the production of poultry and butter, rather than to the production of wheat and pork. *Ceteris paribus*, it can be concluded that poultry producers are currently in the best competitive situation, in

view of Poland's accession to the eurozone and the resulting irrevocable fixing of the PLN/EUR exchange rate. Pork producers are at the greatest risk of deterioration in the competitive position due to this potential change, especially with the possible appreciation of the zloty against the euro.

4.5. Conclusion

Both the Polish agri-food exports and imports were changing considerably in the analysed period. In particular, a strong upward trend was observed in relation to the international trade balance. In accordance with the general opinion, it may result from exchange rate fluctuations ranging from 3.26 to 4.85. However, the analyses undertaken suggest that only a very little share of export volatility can be attributed to zloty exchange rate volatility, although periods of lower and higher export dynamics were accompanied by zloty appreciation and depreciation, respectively. It is, therefore, likely that the main driving forces boosting the Polish agri-food exports were of different nature. They may include: successful adjustments in the period of economic transformation, cost advantage (lower labour costs), opening foreign markets, growing demand for Polish products better meeting international quality requirements and standards.

When comparing relative prices with the exchange rate, in most cases the relative undervaluation of the Polish currency and price convergence can be observed on agri-food markets. Given this fact, emergence of relative winners and losers, i.e. branches with better or worse performance, among the branches of the agri-food sector will depend on the accepted zloty conversion rate when joining the monetary union. Importantly, the current market exchange rate of about PLN 4 to EUR 1, as a potential conversion rate, would rather be favourable to maintain the competitiveness of the Polish agri-food exports and, at the same time, would stabilise their surplus.

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5. Definition of bread market potential in Ukraine

5.1. Introduction

Bread is one of the basic products in the diet of an average Ukrainian. All political parties tend to use the bread and bakery products prices as the means of social tension relieving in their election campaigns. This tendency hinders the industry development and creates a shadow turnover in the bread market. Due to this fact, bread prices in Ukraine are among the lowest in Europe and the CIS countries, and bread production became unprofitable for 46% of the baking industry enterprises.

Rational consumption norms or norms on which the minimum consumer basket is calculated are the basis for certain food markets capacity calculation. Rational consumption norms involve many parameters, including the provision of a balanced diet and ensuring the needs of a human body for vitamins, minerals and energy. The actual level of food intake is also influenced by the level of spending capacity of population, which determines the size and cost of a food basket.

5.2. Determination of the potential bread market capacity

There are different approaches to market capacity justification in the modern literature. Thus, local experts estimate bread market capacity at 4.1-4.2 million tons per year, based on the calculation of the daily biological consumption rates per person (about 240 g per day).

According to Resolution of Cabinet of Ministers of Ukraine of the 14th of April 2000 №656 "On approval of food sets, non-food goods sets and services for major social and demographic groups" [Resolution, 2000], consumption rates that determine the subsistence minimum for an average Ukrainian are taken as the basis for market capacity calculation. With regard to the above--mentioned there are different rates of bread and bakery products consumption for the four groups of population: children aged 0 to 6 years, 6 to 18 years, adults and disabled people. The calculations made it possible to determine the market capacity as 4291.68 tons in 2012.

Another approach can be used to determine the potential market capacity. This approach considers bread and bakery products consumption rates according to 8 age groups of population [Tereshchenko et al., 2013].

Calculation of the bread market capacity, taking into account the distribution of population by eight age groups enabled to determine the potential bread market volume at the level of 4169.52 tons.

Despite the differences in proposed methods, deviation in determining the potential bread and bakery products market is insignificant and it is equal to about 3 percent. In terms of 2012 this deviation is 122 thousand tons. Thus, the average value of the bread market capacity in 2012 can be estimated at the level of 42,301.6 thousand tons.

Table 1. The comparison of the results of calculation of the potential bread market capacity, thousand tons

Year	Bread market capacity according to		Deviation		The average value of market capacity
	the first approach	the second approach	absolute	relative, %	
2011	4302,47	4183,67	118,80	2,76	4243,07
2012	4291,68	4169,52	122,16	2,85	4230,6

Source: Own elaboration.

We believe that it is more rational to use a second approach [4], since it takes into account the difference in the bread and bakery products consumption to a greater extent.

5.3. Factors influencing the capacity of the bread market

The actual level of production of bread and bakery products in Ukraine is declining. The decline of bread production is associated with both a tendency to dwindling population and other factors, including: changing consumption patterns, increasing tendency of making home-made bread, the deterioration of the quality of bread produced in a production environment etc.

Over the last 10 years the population of Ukraine decreased by 5.5% [Demographic Yearbook, 2013], while grain production decreased by 28.1% [Osaulenko, 2013]. Thus, the rate of change in grain production greatly exceeds the rate of population change, namely more than 4 times. Therefore, the decline of bread production could not be explained only by this factor.

The decline of bread and bakery products consumption is often explained by the change of income levels, which caused some changes in food consumption structure and consequently a spending redistribution towards increasing consumption of animal products (meat and dairy) as well as fish. This factor, according to some experts, led to reduction in the consumption of bread and bakery products. However, this statement cannot be considered valid because

the peak consumption of milk and milk products per capita was in 2006 and it constituted 235 kg per year. By 2012, milk consumption declined to 214.9 kg. Moreover, if by 2005 the consumption of grain products increased, it has been rapidly decreasing since 2006.

Table 2. Food consumption, for one person per year; kg

Food products	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Meat and meat products (equivalent to meat, including fat and by-products in kind)	35	39	39	42	46	51	50	52	51	54,4
Milk and dairy products (equivalent to milk)	226	226	226	235	220	214	212	206	205	214,9
Grain products (bread, pasta in terms of flour, flour, grains, legumes)	125	126	124	120	114	115	112	111	110	109

Source: [Osaulenko, 2013; Vlasenko, 2013].

Moreover, there are some doubts as to the correctness of submitted official statistical data regarding the positive dynamics of consumption of most basic food products, starting from 2006-2007, because the increasing amounts of total spending started in 2008 caused the increase of spending on food from 53.0% to 56.7% in 2010 and the gradual reduction of 1 percentage point over the past two years to a level of 55.7%. At the same time, the cost of food increased in 4.3 times during the investigated period.

Also the proportion of population with average equivalent cash income per capita per month below the subsistence level still is high. In 2008 this proportion was 11.4%, while in 2012 it constituted already 15.1%. During the same period, average consumption of grain products decreased by 6 kg, compared to 2008, and in 2012 its value was 109 kg with an increase in consumption of meat and meat products by 3.4 kg per year over the same period.

In addition, one of the reasons for the reduction in consumption of manufactured bread is the tendency of making home-made bread. Experts estimate that the amount of home-made bread is about 400 thousand tons. The replacement of industrial production of bread by baking it at home should have stimulated the growth of flour production.

A more significant factor affecting the rate of bread production, according to official statistics, is the growing shadow market of this product.

5.4. Determination of the bread shadow market

The calculations show that the statement concerning a significant reduction in the consumption of manufactured bread and bakery products is incorrect. Most likely, the subject should be determined as the growth of unaccounted bread production. Thus, it can be both small bread production companies that do not provide statistical reports to the statistics authorities and industry enterprises implementing the sales schemes of officially unaccounted bread.

Table 3. The shadow market of bread and bakery products in Ukraine in 2011-2012

Values	2011	2012
Flour production, thousand tons	2595	2603
Potential bread and bakery products production based on flour production volume	3373,5	3383,9
The actual production of bread and bakery products according to official statistics, thousand tons	1769	1668
Production of home-made bread	400,0	400,0
Production of home-made bread according to official statistics, thousand tons	2169	2068
The volume of unaccounted bakery products, thousand tons	1204,5	1315,9
Specific weight of the shadow market, based on the amount of flour production, %	35,7	38,9
Bread and bakery products market in Ukraine according to calculations performed, thousand tons		
According to Approach 1	4302,47	4183,7
According to Approach 2	4291,7	4169,5
The volume of bread and bakery products shadow market in Ukraine, thousand tons		
According to Approach 1	2133,47	2115,7
According to Approach 2	2122,70	2101,5
Specific weight of the shadow market in the total market, based on the consumption of bread and bakery products according to RNS, %		
According to Approach 1	49,59	50,57
According to Approach 2	49,46	50,40

Source: Calculated by the author.

Most publications indicate the significant growth of unaccounted bakery products market [Vasil'chenko, 2013]. The analysts report that, according to official data based on the production of bread and bakery products per year,

when it comes to consumption of bread and bakery products (in physical terms and without pasta, cereals and legumes), bakery industry meets only 1/3 of the consumer demand.

We defined the potential capacity of unaccounted in official statistics bread market using the data concerning the potential market of bread and bakery products applying the approaches presented above (Table 3). In this case, calculations were made based on the volume of flour production, the rules of output of finished products obtained from 1 ton of flour and a possible output of home-made bread.

Thus, if flour production volumes are taken as the basis for bread market capacity calculation, the volume of shadow turnover of bread in 2011-2012 was 1204.5 and 1315.9 million tons, or 35.7 and 38.9 per cent of the potential market volume respectively. In calculating the potential bread market capacity according to rational consumption norms, the shadow turnover in the bread market made up 49-51 per cent, or 2.1 -2.13 million tons in 2011-2012.

5.5. Conclusions

1. Decrease in the production volume of bread and bakery products according to official statistics cannot be explained only by the reduction of the population of Ukraine, as the reduction of production level is far ahead the depopulation rate.
2. Rising income level does not explain the improved consumption patterns of population, or the reduction in bread consumption, because the share of population having an income lower than officially approved minimum consumer budget has been increasing and in 2012 it amounted to 15.1%.
3. The use of administrative methods of industry regulation was one of the reasons for the reduction of officially counted bread and bakery products production.

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III. Human capital and rural development

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1. Slovenian agriculture and rural areas in the post-accession period: achievements and challenges ahead

1.1. Introduction

In 2004, eight countries of the Central and Eastern Europe (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) – as well as two Mediterranean countries, Malta and Cyprus – acceded to the European Union (EU). Therefore, the transition process from the former socialist system to market oriented agriculture formally came to an end. However, despite the long lasting preparations of these countries during the pre-accession period, accession to the EU was somehow a step into an unknown territory. This is particularly true for the agricultural sector and rural areas. That may explain why the impact of enlargement in agriculture in the New Member States (NMS) has been one of the most debated topics [Csáki and Jámbor 2009, 2010, 2013; Kiss 2011]. The tenth anniversary of accession is a good opportunity to analyse the achievements and challenges in the food sector and rural areas 10 years after accession to the EU, to assess the developments in NMS' agriculture and to evaluate the current status of the agricultural sector and rural areas. That is why it is crucial to identify phenomena that have been observed in the agri-food and rural areas of the new EU Member States over the last ten years as well as to assess the sustainability of these phenomena while highlighting similarities and differences between the NMS.

The available scientific literature shows that the NMS accession to the EU has had a significant impact on the NMS agricultural performance [Csáki and Jámbor 2013]. It seems that the post-accession agricultural performance of the NMS has been strongly influenced by the agricultural policy framework prevailing in the individual countries during the pre-accession period especially from 1998 to 2004. The candidate countries implemented quite different policies

[Swinnen and Rozelle 2006]. The most critical component of pre-accession policies was the level of support to agricultural production [Csáki and Jámbor 2009]. The NMS have differed significantly in utilising possibilities of the EU enlarged market, mainly due to initial conditions, pre-accession, and post--accession policies [Csáki and Jámbor 2013]. The way how the countries used pre-accession EU-provided facilities, such as SAPARD (Special Accession Programme for Agriculture and Rural Development), ISPA (Instrument for Structural Policies for Pre-Accession) and PHARE (Programme of Community aid to the countries of Central and Eastern Europe)[63], has also an impact on the post-accession performance. Countries focusing on competitiveness enhancement and production improvement benefited more from these resources [Swinnen and Rozelle 2006]. The way of creating the institutional framework for the Common Agricultural Policy (CAP) implementation had significant influence in some countries. Delay in creating the required institutions caused some difficulties. The not fully finalised institutional framework resulted in the loss of some the EU funds in a number of countries [Csáki and Jámbor 2009].

Among the EU Member States, Slovenia has an above-average rural share. Given the OECD (Organisation for Economic Co-operation and Development) criteria, 67 per cent of all Slovenian municipalities representing 77 per cent of the entire national territory, are designated as rural areas, where 41 per cent of the total population live. The demographic structure of rural areas in Slovenia is less favourable, mainly due to the ageing of the population and simultaneous migration of young people from rural areas. The unfavourable age structure of rural areas is particularly evident in farm households. There are two types of migration flows in rural areas. In the rural areas near urban centres (peri-urban) increased population density has been registered. The more marginal rural areas, however, are still being abandoned. Negative demographic and economic trends are therefore particularly evident in more peripheral and marginal rural areas. These areas also lack infrastructure equipment as one of the prerequisites of economic and social development [Ministry of Agriculture – Slovenia 2013].

The present paper attempts to provide insights about the implications of Slovenia's accession to its agricultural sector and rural areas.

[63] Originally created in 1989 as "Poland and Hungary Assistance for the Restructuring of the Economies" (PHARE).

1.2. Data and methods

The impacts of accession on agriculture and rural development were analysed on the basis of secondary data, especially from the European Commission (Eurostat), FAOSTAT and the World Bank. The main focus was put on selected economic (e.g. share of agriculture in GDP, size and number of agricultural holding, agricultural labour, etc.), environmental (e.g. share of arable land, share of land under organic farming, etc.), and social indicators (e.g. farmer's education, farmer's age, share of employment in agriculture by gender, etc.) in the 2000-2013 period. In relation to the type of data, statistical descriptive analysis and trends of different selected indicators were performed.

1.3. Results and discussion

The role of agriculture in national economy

The role of agriculture in national economy is best characterised by the share of agriculture in GDP. In 2000, most of the NMS had a share of 3-5%, according to the World Bank [2014]. After the EU accession, shares in all cases decreased, though largest drops can be seen in countries with originally high values [Csáki and Jámbor 2009]. In the case of Slovenia, the share of agriculture in GDP decreased from 3.3% in 2000 to 2.4% in 2007 (Table 1).Therefore, the role of agriculture has further decreased in the NMS economies after accession [Csáki and Jámbor 2013].

Table 1. Share of agriculture in GDP (%) in Slovenia and the EU Member States

	2000	2003	2006	2010
Slovenia	3.30	2.50	2.39	2.46
EU-12	1.94	1.61	1.53	1.45
EU-15	2.21	1.88	1.72	1.68
EU-25	3.07	2.64	2.34	2.13
EU-27	3.76	3.31	2.76	2.39
EU-28	3.85	3.38	2.84	2.48

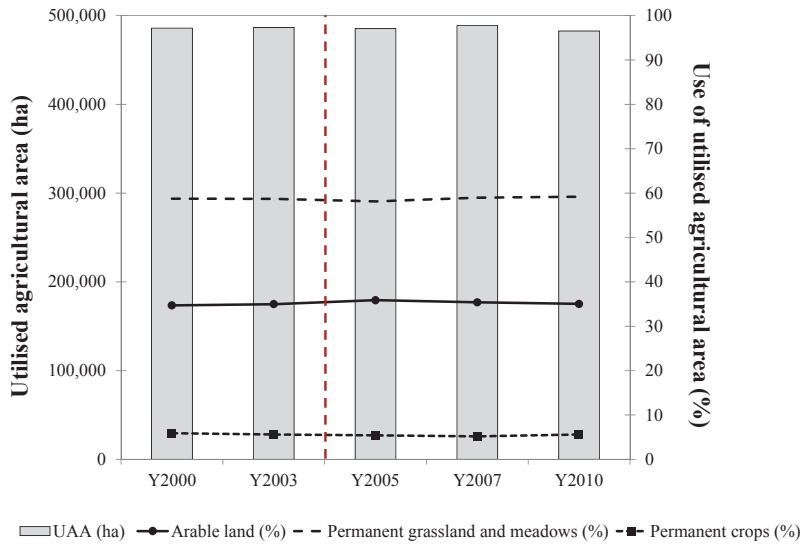
Source: World Development Indicators [The World Bank, 2014].

A high intensity of economic activity in the EU-27, measured of the share of gross value added (GVA), is concentrated in predominantly urban areas. However, the predominantly rural regions generate more than 35% of total economic activity in Slovenia [EC 2013].

Agricultural land use

Different groups of countries can be identified in the EU-27 according to their dominant form of land use: arable crops are the principal form of land use in all but five Member States. In Ireland, the United Kingdom, Slovenia and Luxembourg more than 50% of utilised agricultural area (UAA) is used for permanent grassland and meadows (Figure 1). Permanent crops are most important in the Mediterranean countries [EC 2013].

Figure 1. Size of utilised agricultural area (ha) and the share of selected land uses of utilised agricultural area (%) in Slovenia



Source: [Eurostat 2014].

Slovenia has a lower share of arable land (AL) in UAA with respect to the other NMS [Csáki and Jámbor 2009]. The share of AL remained almost the same after accession (Table 2).

Table 2. Changes in land use in 2003-2007 (1000 ha) in Slovenia

	2003		2005		2007		2007/2003 (%)
	UAA	of which arable land (%)	UAA	of which arable land (%)	UAA	of which arable land (%)	
Slovenia	510	34	510	35	500	35	98

Source: [FAOSTAT 2014].

Differently implemented land and farm consolidation policies in the NMS have had diverse effects on post-accession country performance. Restrictive pre--accession land policies and the lack of land and farm consolidation (e.g. in Hungary) has negatively influenced the capacity to take advantage of the enlarged markets by constraining significantly the flow of outside capital to the agricultural sector [Csáki et al. 2008; Ciaian et al. 2010].

Agricultural land use structure and farm size

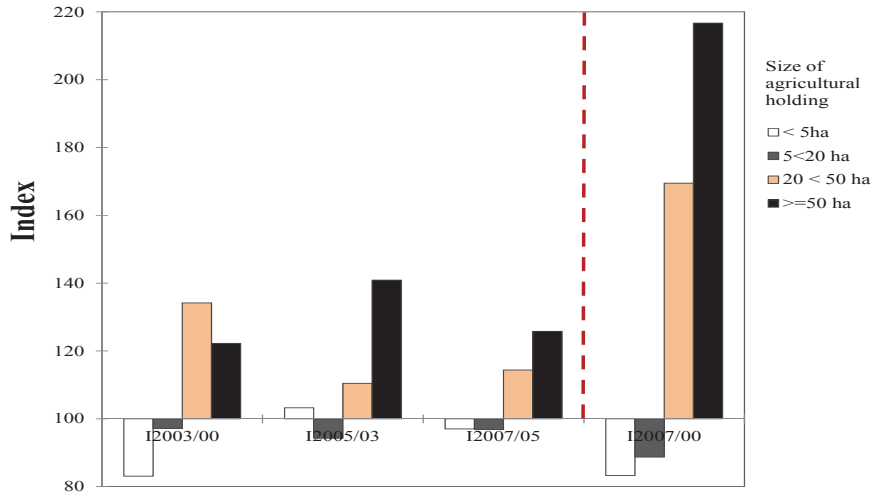
Reform processes of the 1990s have created a mixed farming structure in the NMS containing combinations of large-scale and small-scale farms with the exception of Poland and Slovenia [Csáki and Forgács 2008]. In these two countries, small-scale farms dominated agriculture during the socialist period and they have not been changed much after 1990. There are huge differences among countries regarding land use structure. In 2003, the major part of land was cultivated by small farms in five out of ten countries, including Slovenia. On the other hand, large farms dominated land use in other NMS (i.e. the Czech Republic, Estonia, Hungary and Slovakia). Though dual farm structure remained after the EU accession, the dualism in most cases became even stronger.

The large number of very small farms is a specific characteristic of the NMS. The total number of farms decreased after accession. The so-called dual farm structure, however, remained after the EU accession with increasing differences. Share of large farms in land use increased after the EU accession in Bulgaria, Estonia, Hungary, Latvia, Lithuania and Slovenia (Figure 2). After the EU accession, average size of small farms increased by 20%, and that of large farms decreased by 10%, suggesting that the gap between sizes of small and large farms decreased [Csáki and Jámbor 2009].

Data from the Statistical Office of Slovenia for 2010 show that the size structure of utilised agricultural area slightly improved, meaning that in 2010 more agricultural holdings used larger areas of agricultural land than ten years ago. In other words, agricultural land is slightly less fragmented [Statistical Office of the Republic of Slovenia 2012].

Farm subsidies play crucial role on the future existence of farms. Bojnec and Latruffe [2013] state that the post-accession financial support enables the survival of small farms, but it does not favour the maintenance of medium--sized farms and it does not give the right incentives to large farms in terms of economic efficiency, which is by their opinion, critical for competitive agricultural production.

Figure 2. Changes in the size of agricultural holding between 2000 and 2007 in Slovenia



Source: [Eurostat 2014].

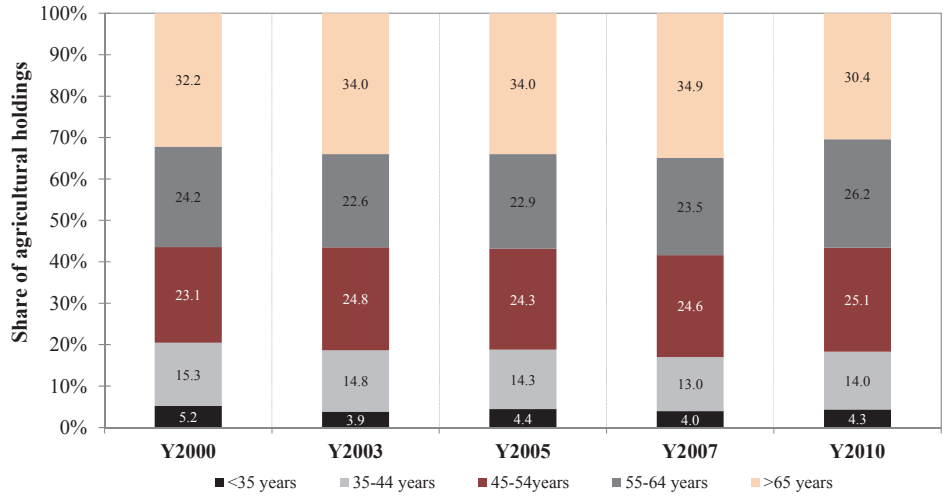
Age structure in rural areas and farmers' education

Populations are ageing in most of the EU's regions, with all the socio--economic consequences that this situation implies. Working-age people account for around 70 % in the predominantly rural regions of Slovenia. Since 2007, the share of young people in rural regions has decreased in 19 Member States, while the proportion of elderly people has increased in all countries except Belgium and Spain [EC 2013]. The number of farmer holders aged less than 35 has slightly decreased in 2000-2010, but, on the other hand, the number of farmer holders aged between 45 and 54 has slightly increased (Figure 3).

Under Axis 1 (Improving the competitiveness of the agricultural and forestry sector), there is Measure 112 (Setting up of young farmers), which is aimed at promoting farms among the younger generation, and improving the age structure of agricultural holding operators, and Measure 113 (Early retirement of farmers and farm workers), which deals with the early retirement of farmers. Both Measures, on the one hand, encourage young farmers to continue

agricultural activities, and, on the other, they encourage older farmers to stop farming early and transfer their farm to a younger farmer, which results in better age structure of agricultural holdings. In the 2007-2013 period, the total expenditure for Measure 112 was fixed at EUR 5 billion, and for Measure 113 at EUR 4.1 billion [Murphy 2012]. The largest amount of investments realised for the Measure 112 has been recorded in Italy (EUR 339,229 million), while in Slovenia the amount has reached up to EUR 26,694 million, thus the declared target outputs in the 2007-2013 programming period. In relation to Measure 113, Poland supported the largest number of farmers and farm workers by 2011 (74% of the EU total). By 2011 Slovenia has reached 66% of its national targets for 2007-2013.

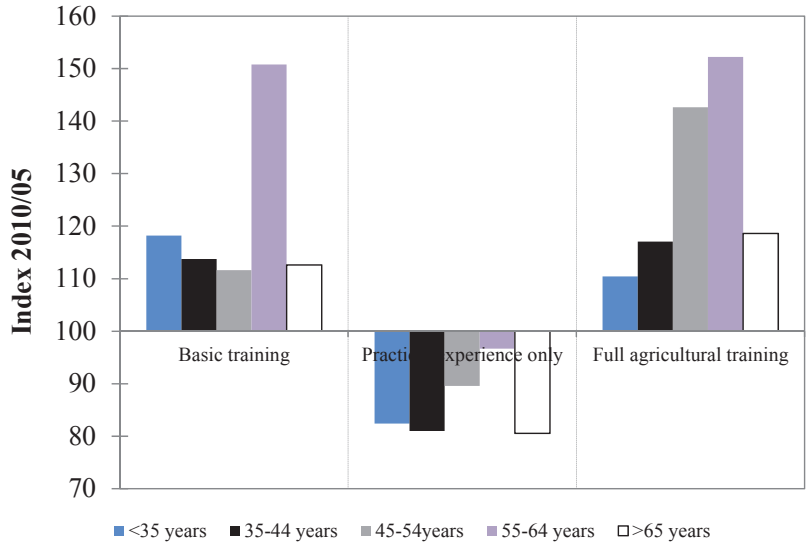
Figure 3. Share of agricultural holdings (%) by age of farm holder in Slovenia.



Source: [Eurostat 2014].

A part of the EU funds were devoted to the education and knowledge transfer in agricultural sector. The result is that the number of farmers aged from 55 up to 64 with basic and full agricultural training increased (Figure 4).

Figure 4. Farmer's education and farmer's age in the 2005-2010 period in Slovenia.



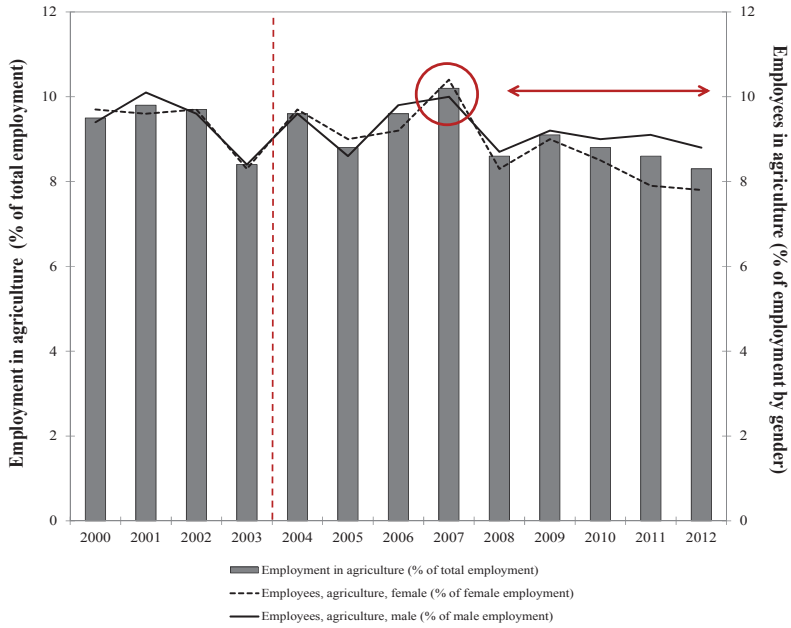
Source: [Eurostat 2014].

Labour in agricultural sector

The rural or urban character of a region does not seem to have a direct impact on the stronger or weaker presence of farmers with other non-farm gainful activities. In some countries (Bulgaria, Romania, Slovenia, Estonia and the Netherlands) the share of farmers with other gainful activities is highest in predominantly rural regions [EC 2013].

Generally speaking, after the accession agricultural labour slightly decreased in Slovenia (Figure 5).

Figure 5. Employment in agriculture in Slovenia.



Source: World Development Indicators [The World Bank, 2014].

Food industry jobs in the EU-27, by countries and in absolute terms, are most numerous in Germany, followed by France and Poland. When compared with total employment in manufacturing, the Czech Republic, Slovenia, Slovakia and Sweden had the lowest shares in 2012 (below 10%).

Employment in the food industry, in the EU-27, has decreased by 334,500 persons in the 2007-2012 period. The highest relative decrease took place in Bulgaria, Denmark, Lithuania, Luxembourg, Malta and Slovenia (more than –4% annually). The share of the food industry in the overall economy is higher in the EU-12 than in the EU-15 (3.3% and 1.9%, respectively). In Luxembourg, Sweden, Denmark and Slovenia (1.5%), the food industry had the lowest shares in the overall economy in 2012 [EC 2013].

Economic performance of agriculture

Capital, as another factor of production, is usually measured in agriculture by the stock of assets per hectare of agricultural land. In general, countries with high agricultural production capacities lag behind in asset endowment. In 2004, Slovenia had the greatest amount of asset endowment (total assets/UAA) among the NMS [Csáki and Jámbor 2009]. According to the Farm Accountancy Data

Network (FADN) data, after the accession the total agricultural assets per UAA slightly increased in Slovenia (Table 3).

Table 3. Total agricultural assets per UAA (EUR/ha)

	2004	2006	2006/2004 (%)
Slovenia	16,022	16,397	102

Source: [FADN 2014].

Agricultural output development is one of the indicators for assessing the impact of accession. There are very significant differences regarding the level of agricultural output per hectare among the NMS [Csáki and Jámbor 2009]. Agricultural output per hectare in the NMS after accession varied between 500-1,000 EUR/ha in the 2004-2010 period. The highest values of agricultural output per hectare are noted in Slovenia (around 2,000 EUR/ha), while the lowest values are recorded in Latvia in all years analysed. Agricultural output per hectare in the NMS increased significantly after the EU enlargement [Csaki and Jambor 2013]. Average of the NMS agricultural output was 701 EUR/ha in 2003 and 1,013 EUR/ha in 2007, indicating a 44% increase in four years. Hungary, Poland and Slovenia reached an output level above 1,000 EUR/ha by 2007 (Table 4). However, only Slovenia produces on the EU-15 level [Csáki and Jámbor 2009].

Table 4. Value of agricultural output per UAA in current prices (EUR/ha)

	2003	2004	2005	2006	2007	2007/2003 (%)
Slovenia	1,883	2,223	2,089	2,167	2,227	118

Source: [Eurostat 2014 and FAOSTAT 2014].

The agricultural performance should be also measured in real values. Looking at these figures, growth performance has been less encouraging in some of the NMS. Baltic countries and Poland increased gross agricultural output also in real terms by 10-50%. These are the only NMS where significant positive impact upon production can be seen. Values of Slovenia fluctuated significantly but also were close to 2003 level in 2007 (Table 5) [Csáki and Jámbor 2009].

Table 5. Index of agricultural output in real value (2000=100)

	2003	2004	2005	2006	2007	2008
Slovenia	97.66	106.04	89.19	86.48	90.83	98.10

Source: [Eurostat 2014].

Agricultural yields and trade

Another measure closely linked to agricultural production performance is productivity [Csáki and Jámbor 2013]. Yield is a good indicator of agricultural productivity. Yield of cereals shows huge differences among the NMS. The highest yield in the region is noted in Slovenia, while the lowest in Cyprus in 2004-2007. Average yield of cereals in the region was 3.3-3.7 tonnes/ha, compared to 5.5-6.0 in the EU-15. After the EU accession, though, this gap is narrowing as almost all countries increased their productivity of cereals [Csáki and Jámbor 2009]. In 2010, the highest cereal yield was observed in Slovenia (5.97 tonnes/ha), while the lowest in Cyprus (1.60 tonnes/ha). After the EU accession, all NMS, but Cyprus and Lithuania, were able to increase their cereal yields. The NMS, however, still lag behind the EU-15 land productivity [Csáki and Jámbor 2013].

The accession has strengthened extensive ways of production in the NMS [Csáki and Jámbor 2013]. According to Eurostat data, the structure of production after the accession has moved toward a more extensive direction, namely toward crop production. In 2007, livestock production does not give more than half of the output in any of the NMS. This indicates a significant shift toward a less extensive agriculture, especially in Slovakia, Slovenia and the Czech Republic [Csáki and Jámbor 2009].

After the accession the NMS agri-food export and import have increased in nominal terms. There was a high and increasing share of raw materials in the NMS agri-food export with huge differences among the NMS [Csáki and Jámbor 2013]. The export share of processed products was the highest in Latvia, Malta and Slovenia before 2004. After the EU accession, however, most of the countries changed their product structure and started to increase the share of raw materials in their agricultural export [Csáki and Jámbor 2009]. In the majority of the NMS, there was also an increase in agri-food imports of processed products [Csáki and Jámbor 2013]. In fact, after the EU accession, agricultural import growth in nominal values accelerated in comparison with that of 2000-2003. As a result, Estonia, Latvia, Lithuania, Slovakia and Slovenia passed the USD billion import level [Csáki and Jámbor 2009]. The biggest NMS agri-food exporters were Poland and Hungary. The remaining eight NMS have experienced an increasing trade deficit after 2004 [Csáki and Jámbor 2013]. However, except Hungary, all the NMS had a negative agricultural trade balance, even before accession. This deficit has further increased after 2004, except for Poland, Hungary and Lithuania, partly. Cyprus and Slovenia almost tripled their negative balance from 2003 to 2007. Therefore, the EU accession resulted in an increased trade deficit in the sector of agri-food and beverages products on the NMS level [Csáki and Jámbor 2009].

The accession has had impacts in the NMS also on agri-food markets in general, and prices in particular. After the accession, a significant increase of the NMS agricultural producer prices in nominal terms has occurred, while real producer prices have still remained below the EU-15 levels. Price adjustment was larger in the NMS with lower pre-accession levels [Csáki and Jámbor 2013]. Cereal market prices in the NMS were different, and fluctuating in 2000-2007. Prior to the accession, cereal prices were significantly below the EU level with the exception of Slovenia. After the accession, a quick adjustment took place and cereals prices came closer to the EU-15 level. Nevertheless, the high pre--accession support in Hungary and Slovenia kept prices close to the EU-15 level and led to minimal price adjustment for producers [Csáki and Jámbor 2009].

Agricultural financial support and its effects on agriculture

In some countries like Romania, Hungary and the Czech Republic, the level of pre-accession support to agriculture was close to the EU level. Other countries, especially Poland and Slovakia, maintained a very low level of support. High-level of support could have been beneficial for the post-accession period if this support had focused on competitiveness enhancement. Unfortunately, the support was given in the form of an excessive price and market support, rather than efforts to improve the competitiveness. As a consequence, the effect was negative on a longer term. On the other hand, in countries with low minimum price and market support prior to accession, it proved to be beneficial [Csáki and Jámbor 2009].

Accession process to the EU has significantly changed the structure and scope of agricultural support in Slovenia [Rednak et al. 2003] as well as in other NMS. Direct payments became the most important element of agricultural policy with significant impacts on income of rural households [Csáki and Jámbor 2009]. After accession, the introduction of the CAP based on the Copenhagen agreement provided a uniform framework for national agricultural policies in the NMS. The agreement, however, included provisions for some adjustment to local conditions. The level of support was set on the basis of the yields in the pre-accession period [Swinnen and Rozelle 2006]. Therefore, there have been significant differences in the level of support among the individual countries [Csáki and Jámbor 2009]. According to the agreement, the countries could choose a simplified area-based payment system (SAPS) complemented with additional support for rural development or implementing the EU-15 type CAP. All the NMS, except Slovenia, opted for the simplified payment system [Swinnen and Rozelle 2006].

The Czech Republic, Hungary and Slovenia (the EU-15 type CAP) had the highest amount of direct payments per hectare (52-84 EUR/ha) in the 2004-

-2007 period, whereas the lowest values were in Estonia, Latvia and Lithuania (17-44 EUR/ha). Each NMS was entitled to supplement the CAP payments from its own national budget (TOP-UP) as an addition to the agricultural related public sector expenditures (administration, education, research). National expenditures of the NMS are generally below the EU expenditures on agriculture in vast majority of cases. Therefore, in 2007 the national support amounted to about a one-quarter of the EU funds received. The highest share of national expenditures compared to the EU ones is observable in cases of Hungary and Slovenia. Besides direct payments, the second pillar of the CAP also provides support for farms and broader rural development purposes. Poland and Hungary got the highest amounts of Pillar 2 payments in 2004-2007, while the lowest values were in Slovenia [Csáki and Jámbor 2009].

Kožar et al. [2005] analysed the impacts of different direct payments policy options on income situation of Slovenian agricultural households and concluded that it is likely to improve after the accession under all policy scenarios with respect to the baseline situation before the accession. In fact, gross farm income of agricultural producers in most cases increased in the NMS. It was fluctuating in Slovakia and Slovenia after the EU accession, while increased in vast majority of cases in other NMS. In 2007, income in each country was increased compared to previous years. The highest amount of income is recorded in Slovenia, while the lowest in Slovakia [Csáki and Jámbor 2009]. All in all, there has been a significant increase in farming incomes in the NMS, mainly due to agricultural subsidies. Initial differences among countries, however, have remained [Csáki and Jámbor 2013].

Agriculture and nature protection

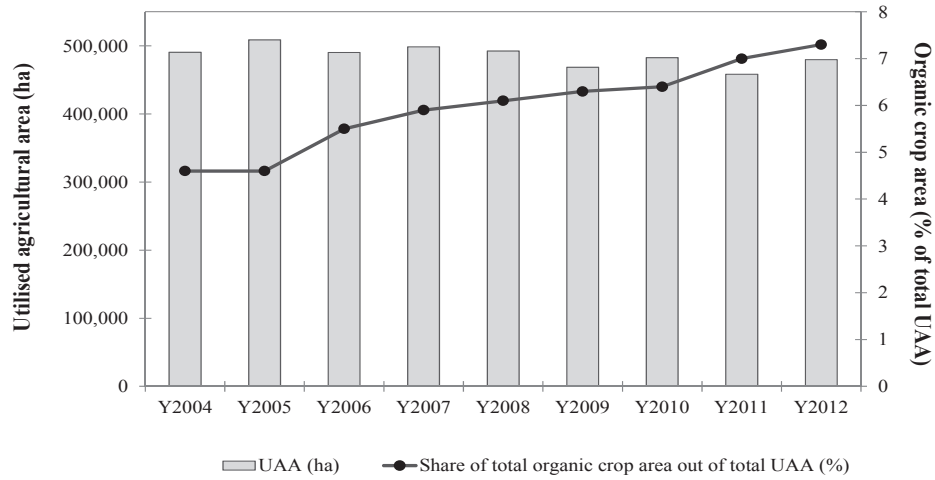
In addition to the most important task of providing people with high-quality food, agriculture takes care of preserving cultivated landscape which has a positive impact on rural development. It also takes care of preserving settlements, particularly in demographically endangered areas, and creates jobs. Therefore the integration of agriculture into the environment and factors related to environmental protection – such as preservation of biodiversity, improving the well-being of livestock, sustainable farming – are being increasingly emphasised.

The importance of the three less favoured areas (LFA) categories (mountainous areas, agricultural areas at risk of agricultural land abandonment, areas affected by specific handicaps) varies among Member States. In Slovenia substantial share of agricultural land (74 %) is designated as LFA. The share of UAA in less favoured mountainous areas is higher than 50% in Austria (50.4%), Finland (50.4%), Greece (53.9%), and Slovenia (69.5%). The share of UAA

under Natura 2000 sites in the EU-27 is the highest in Bulgaria and Slovenia (21.3%), and the lowest in Finland and the United Kingdom. The highest share of high nature value (HNV) farmland in the agricultural area (more than 60%) is in Austria and Slovenia [EC 2013].

Soil degradation by water erosion is particularly significant in some countries of southern Europe, namely in Italy (7.8 t/ha/year), Portugal and Greece, but also in mountainous countries such as Slovenia (7.2 t/ha/year), Austria and the United Kingdom [EC 2013]. The share of agricultural land estimated to suffer from moderate to severe erosion is the highest in Slovenia (37.1%), Italy (27.8%) and Portugal (18.6%) [JRC – ISPRA 2011].

Figure 6. Share of organic area in Slovenian utilised agricultural area in the 2004-2012 period.



Source: [Eurostat 2014].

Organic farming in Slovenia is increasing quickly, but the supply of Slovenian organic foodstuffs on the market does not grow proportionally to the number of organic farms. One of the reasons is the prevailing engagement of organic farms in animal husbandry, although the greatest demand is for vegetables, fruit and non-meat processed foodstuffs. Most of organic products are sold in the conventional retail. From 2004, the share of organic crop area in the total utilised agricultural area has increased by 3% and is still increasing (Figure 6). The Plan of long-term development of organic farming (2005-2015) projects that the share of UAA under organic control will reach 20% by 2015, and that over the next 5 years the number of organic farms is to triple. Future challenges

in organic farming, as stated by Klopčič and Pohar [2014], lie in the increase of demand connected with an improving consumer knowledge and awareness.

1.4. Conclusions

The enlarged EU market, covering around half a billion people, offers tremendous opportunities to the NMS agricultural sectors. The EU accession has increased farmers' incomes, as well as provided a solid and uniform policy and institutional framework, under which national agricultural policies are implemented. However, several difficulties have also emerged after the accession, e.g. a limited potential to withhold competitive pressures; a lack of harmonised support levels; a handicap of small farmers and rural-urban income gap. The uniform policy framework, different levels of national support and the impact of macro-policies had the most important impact on the NMS agriculture after the accession [Csáki and Jámbor 2013].

The review of developments in the agricultural sector of the NMS led Csáki and Jámbor [2009, 2013] to a number of conclusions:

1. In general, the accession had a positive impact upon the agricultural sector as it resulted in a consolidation of production, higher current prices, higher export and import quantities, and especially higher farmers' incomes;
2. The overall positive picture is not complete as there are differences between respective NMS. This diversity is due, *inter alia*, to: initial conditions, pre--accession policies, post-accession policies and the way of implementing the CAP, and macro-policy and the institutional environment;
3. The EU membership has made the NMS part of a large, rather competitive market, which offers tremendous opportunities for the agricultural sector but, at the same time, national agricultural sectors are faced with a significantly increased competition on their domestic markets;
4. It seems that the countries with consolidated farm structure (e.g. Poland, Slovenia) have adjusted faster and more effectively to the demand of enlarged markets than countries emerging from painful land reform and farm restructuring processes;
5. The EU membership has led to a significant increase in subsidies received by the farmers so the increase in farmers' income. However, support is not evenly distributed and small farmers are handicapped in many ways.

The impacts of the accession on agriculture and rural areas have been rather mixed in the case of Slovenia. There were many improvements but there are still some areas of concern. Nevertheless, it seems that Slovenia is in a better situation after accession compared to other countries that joined the EU in 2004

mainly due to the good performance of the agricultural sector even before the accession but also the effective alignment process. That being said, accession resulted as a "stress test" for the sector as it highlighted many strengths but also some weaknesses that should be timely and effectively addressed in order to ensure the competiveness of the Slovenian agricultural sector as well as the vitality and development of Slovenian rural areas.

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2. Czech countryside – development after EU enlargement

2.1. Introduction

Czech society is gradually changing and it is getting closer to the Western European socio-demographic trends. Joining the EU in 2004 was a major event for Czech Republic, which has been reflected in economic and social area. From an economic point of view, rules of the Common Agricultural Policy and rural development have to be obeyed. Due to social structure of the rural population, living conditions are differentially changing. Proportion of the rural population employed in primary agricultural production decreased; unemployment of some age and professional groups still continues. Agriculture fell among the branches with the lowest pay. Some rural population groups suffer from social exclusion, because they are unable or unwilling to flexibly respond to the current highly competitive market environment; some groups are disadvantaged by reduction in social spending. Consumption of food and services is differentially growing. Differentiation is influenced by many factors – price control of products and foods that are not beneficial to health (e.g. tobacco and alcohol), food promotion and support of products with regional or national origin, purchasing power of the population, marketing strategies. Access to EU helps to structure the economy of the Czech countryside and affects some social trends of the rural population.

2.2. Development of social preconditions in the Czech Republic (2004-2013)

The development in the last decade must be analysed in combination with the social and economic preconditions of rural life and with regard to the common European and national trends, which are influenced by all these factors.

Unfavourable attributes of social-demographic development and polluted environment (which also affected these attributes) belonged to highly criticised life spheres before 1989. A life way reflected the economic possibilities and prevailing social values. Seventies and eighties of 20th century were characterised by the strong orientation on the private life and own family. Meaningful professional careers were related only to the smaller part of population. There was advanced second-housing of urban inhabitants in the villages, rural people

pursued the gardening, private plot, house and flat reconditioning, handicraft, processing of agricultural products and other activities, connected with the functioning of family and household. These works substituted to a large extent the insufficient food-supply and missing services. Private activities expressed largely the resignation to the public involvement. The life style[64] was influenced by existing wage-levelling, by different kinds of social support (e.g. young families and solitary mothers) and possibilities of leisure time. Changes of social and demographic data also reflect the changing level of health care, gradual improving of environment as well as the dissimilar conception of family life and building of professional careers. Czechoslovakia with the 15 millions of inhabitants was divided in two independent states – the Czech Republic (about 10 millions) and Slovak republic (about 5 millions of inhabitants) in 1993.

Significant changes appear in the development of the Czech population basic social-demographic data after 1989. The divorce rate increased significantly. More than one half of contracted marriages divorce today (see Table 1). Infant mortality, which was traditionally low, decreased even by about half. Abortions fell off significantly; it is probably the result of easier access to birth-control, better medical enlightenment, raising responsibility of young couples and maybe also the markedly increased charge of miscarriage.

Share of illegitimate births during the analysed period grown exceedingly. At the end of eighties the cohabitation of unwedded couples and illegitimate birth were still perceived like, in a manner, social stigma. Young women preferred temporary married life because the social status of single woman was lower that status of divorced woman, in spite of the state privileges. Single mothers were financially supported and their children were being sent to the nursery in preference. However, financial support could compensate for the quality of functioning matrimonial cohabitation neither economically nor socially.

[64] Majerová, V.: *Životní způsob pracovníků v zemědělství*. In: Sociologie zemědělství. 1984, č. 2.

Table 1. Basic social and demographic data

Year	Marriages		Divorces		Abortions	
	Total data	Per 1000 inhabitants	Total data	Per 1000 inhabitants	Total data	Per 100 births
1989	81 262	7.8	31 376	3.0	126 507	98.2
2004	51 447	5.0	33 060	3.2	41 324	42.2
2005	51 829	5.1	31 288	3.1	40 023	39.0
2006	52 860	5.1	31 415	3.1	39 959	37.7
2007	57 157	5.5	31 129	3.0	40 917	35.6
2008	52 457	5.0	31 300	3.0	41 446	34.6
2009	47 862	4.6	29 133	2.8	40 528	34.2
2010	46 746	4.4	30 783	2.9	39 273	33.4
2011	45 137	4.3	28 113	2.7	38 864	35.7
2012	45 206	4.3	26 402	2.5	37 733	34.6

Source: *Czech Statistical Office, 2013*.

Table 2. Basic social and demographic data

Year	Live births		Still births	Live births outside marriage	
	Total data	Per 1000 inhabitants	Total data	Total data	Percentage
1989	128 356	12.4	525	10 141	7.9
2004	97 664	9.6	265	29 839	30.5
2005	102 211	10.0	287	32 409	31.6
2006	105 831	10.3	299	35 259	33.2
2007	114 632	11.1	315	39 537	34.4
2008	119 570	11.5	272	43 457	36.3
2009	118 348	11.3	319	45 954	38.7
2010	117 153	11.1	293	47 164	40.3
2011	108 673	10.4	317	45 421	41.8
2012	108 576	10.3	379	47 088	43.4

Source: *Czech Statistical Office, 2013*.

New social model, closer to West European reality, started step by step. Possibilities unknown before 1989 opened for young people – travelling, education (including abroad education), entrepreneurship and free decision about own life. Views concerning cohabitation of young couples changed at the same time. Shared living and housekeeping of youth was not so strongly subjected to social conventions. The part of unmarried couples and so called "singles" (youths who voluntarily stay alone) grew. The relation to homosexual couples also turned and the marriage of persons of the same sex was legalized.

Table 3. Life expectancy

	Women (years)		Men (years)	
Country/Year	2004	2012	2004	2012
EU 28	81.5	83.1*	75.2	77.5*
Spain	83.7	85.5	78.9	81.6
France	83.8	85.4	78.6	80.6
Liechtenstein	85.1	85.2	78.4	79.9
Czech Republic	79.1	81.2	72.5	75.1
Poland	79.2	81.1	70.6	72.7
Bulgaria	76.2	77.9	69.0	70.9
Serbia	75.5	77.5	65.6	68.9
Macedonia	75.8	76.9	66.2	68.4

* = interrupted series.

Source: Czech Statistical Office, 2014.

The increase of male life expectancy at birth from 72,5 to 75,1 years and female life expectancy at birth from 79,1 to 81,2 years (2004-2012) is a good message. There are probably more reasons – improvement of health care, progress of diagnostic methods, regeneration of environment and change of catering customs of the Czech population. A choice of first-rate supplies and its accessibility are broader. Vegetable, fruits and white meat are more consumed.

General advancement of life expectancy in the European comparison shows, that the gender differences continue. At the same time, the differences between more and less developed countries always exist.

Above the European average of men life expectancy are from chosen countries Iceland, Switzerland and Sweden, below the average are the Czech Republic, Poland, Bulgaria, Latvia and Lithuania. Women life expectancy exceeds the average EU-28 in Spain, France and Liechtenstein, below average are the Czech Republic, Poland, Bulgaria, Serbia, and Macedonia.

Improvement of life expectancy during the pursued period in both groups (men and women) as well as all chosen countries (with highest and lowest values of life expectancy) ranges about 2 years. Abnormalities toward upwards as well as below are not significant. It seems that the European progress of this indicator is quite stable.

Nevertheless, other health threat appears and becomes strong. The share of persons with overweight (including children) is embarrassing. Physical ability of Czech population goes down. Children have not enough of exercise; leisure time is spent by the passive pursuits (TV watching, PC games, Internet surfing etc.). There is a lack of good-class, cheap and accessible relaxation and sport facilities for youth as well as for the other age groups. Possibility

of adequate sport facilities for seniors is practically missing or is financially unbearable for them.

Rural population is more touched by some of mentioned data. There are not differences in data, concerning of family life and life expectancy. Differences are perceptible by the size of community, which influences the social structure of inhabitants, especially age structure. Older age groups prefer more traditional conception of family and household. They are not insofar touched by all possibilities, used by the youth – travelling, education, entrepreneurship, etc.

2.3. Impacts of Common Agricultural Policy on Czech Agriculture

The Common Agricultural Policy (CAP) is now more than fifty years old. The Common Agricultural Policy is one of the most important agenda of the European Union. Policy on common market with agricultural products is one of the oldest political activities of European Communities/European Union.

The Czech Republic entered into the European Union on May 1, 2004 and had to adopt conditions of the Common Agricultural Policy of the EU and others policies. Impacts of the Common Agricultural Policy on Czech agriculture are numerous – both positive and negative. Positive impacts are evident mainly in growth of financial sources for farmers, but this is connected also with more requirements on administrative. The most striking impact of the Common Agricultural Policy is fall in the livestock production[65]. The milk, sugar and wine market in the European Union is regulated by a quota system.

Accessing the EU meant for Czech farmers many advantages, especially in the form of an increase in income and living standards, higher purchase prices and expanding export options. The individual sectors should join the EU a different impact.

Czech adapt gradually to the system of market regulation in the EU (such as quotas for growing certain crops or milk production or support a ban on planting new vines). This caused changes in the commodity structure. Significantly was changed mainly Czech sugar industry. During the reform of the Common Market Organisation for sugar came the Czech Republic by 22.5% sugar quota proportionately with the decreased production of sugar beet area[66].

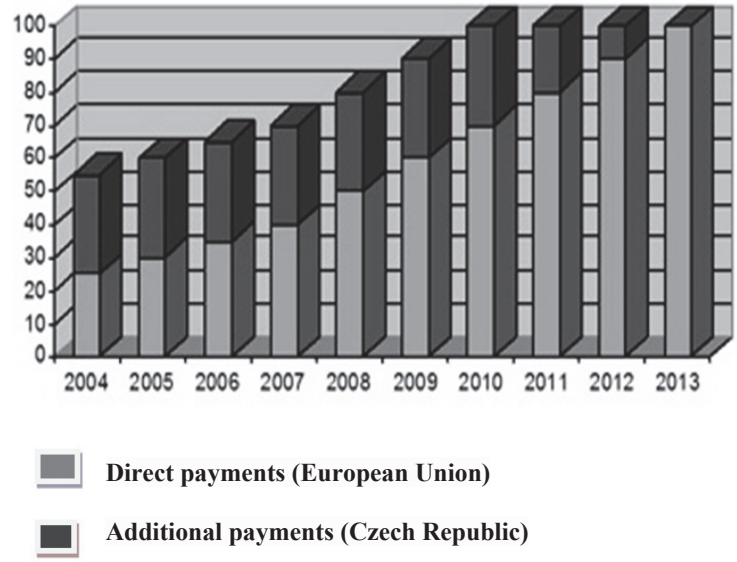
Trade with EU countries make up the vast majority of the international trade of the Czech Republic and EU common market a decisive influence on the

[65] Svobodová, H., Věžník A.: *Impacts of the Common Agricultural Policy of the European Union in the Vysočina Region (Czech Republic) by the View of the Farmers*. Journal of Central European Agriculture, Zagreb: University of Zagreb, 2011, Vol. 12, No. 4, pp. 726-736. ISSN 1332-9049. doi:10.5513/JCEA01/12.4.982.

[66] https://www.euroskop.cz/8924/sekce/zemedelstvi/.

national market in the country. By joining the EU, the Czech agricultural sector was exposed to direct competition from 26 other states. A condition for the economy, including support from the EU budget and national budgets, however, differs between Member States[67].

Figure 1. The share of direct payments and additional payments in the Czech Republic 2004-2013



Source: https://www.euroskop.cz/8924/sekce/zemedelstvi.

Terms negotiated before the accession of ten new Member States in 2004, put their farmers at a disadvantage compared to farmers in the so-called "old Member States". Farmers "in the new Member States" received in its first year of membership only 25% of direct payments compared to the "old Member States". The subsidy amount is gradually increased. Differences will persist until 2013, when the payments are aligned. New Member States may, on its own resources top up direct payments to the national complementary payments, also called top-ups. Governments can increase payments by 30% over the year, but cannot exceed 100% [68].

The Czech Republic did not apply for the execution of direct payments the single payment scheme, but a simplified system, called the Single Payment Scheme

[67] https://www.euroskop.cz/8924/sekce/zemedelstvi/.
[68] https://www.euroskop.cz/8924/sekce/zemedelstvi/.

(Single Area Payment Scheme – SAPS). In this framework, farmers receive a single payment per hectare of agricultural land. This system can be used up to 2013[69].

In addition to payments under the single area payment and additional payments, farmers can raise funds in support of less favoured areas and areas with environmental restrictions (LFA). The purpose of these payments is a financial settlement less favourable conditions especially in foothill and mountain areas. Based on the strategy defined in the National Strategic Rural Development Plan, farmers can obtain funds from the European Agricultural Fund for Rural Development[70].

Implementation of the Common Agricultural Policy in the Czech Republic is in the responsibility of the Ministry of Agriculture in cooperation with the State Agricultural Intervention Fund. The measures include: the common organization of EU market, direct payments, national additional payments, structural support programs and rural development programs[71].

The Common Agricultural Policy reform 2014-2020

The European Parliament approved that the new rules of the common agricultural policy in the European Union will apply until 2020. Bring out other lower subsidies for large farms and the end of sugar quotas since 2017. The Czech members of the European Parliament agree that the reformed common agricultural policy is to protect the interests of Czech farmers. The very first reform of the EU Common Agricultural Policy was approved after three years of wrangling between the Parliament and the Council. Since its implementation in Member States will take at least half a year, it was decided that in 2014 there will in principle apply existing rules and new agricultural policy will take effect from 1 January 2015[72].

The Common Agricultural Policy is part of the multiannual financial framework for the years 2014-2020, when it is earmarked EUR 373.2 milliard. The post-2013 Common agricultural policy will put more emphasis on environmental protection, ensure fairer distribution of EU funds and help farmers to cope better with market challenges[73].

[69] https://www.euroskop.cz/8924/sekce/zemedelstvi/.
[70] https://www.euroskop.cz/8924/sekce/zemedelstvi/.
[71] https://www.euroskop.cz/8924/sekce/zemedelstvi/.
[72] https://www.euroskop.cz/8963/23237/clanek/reforma-spolecne-zemedelske-politiky-prosla-europarlamentem.
[73] https://www.euroskop.cz/8963/23237/clanek/reforma-spolecne-zemedelske-politiky-prosla-europarlamentem.

Impacts on Czech agriculture

According to the approved reforms, temporarily remain some quota systems – for milk in 2015, for sugar, the year 2017 and wine in 2030. Czech agriculture touches the change in direct payments, which is the basic subsidy provided to farmers. You should favour small farms and large subsidies reduced. This is disadvantageous for the Czech farms that are larger on average than in other EU countries.

To ensure that direct payments go only to active farmers, members of the European Parliament persuaded the Council to draw up a blacklist of entities, such as airports or sport clubs, to be automatically excluded from EU funding unless they prove that farming contributes a substantial share of their income. Parliament also insisted on a mandatory EU-wide scheme to give young farmers an extra 25% in top-up payments for their first 25 to 90 hectares. Small farmers could also get more money, whereas large farms receiving more than 150,000 Euro will see their payments above that level cut by at least 5%[74].

Under the new Common Agricultural Policy, 30% of member states budgets for direct payments may be spent only if mandatory greening measures, such as crop diversification, maintaining permanent grassland and creating "ecologically-focused areas" are carried out[75].

"Double funding", i.e. paying farmers twice for delivering the same set of environmental benefits, will not be allowed and farmers who fail to apply mandatory greening measures will face additional penalties on top of losing their "greening" subsidies, which will be phased in during the first four years of the new Common Agricultural Policy[76].

2.4. Employment in rural areas

Rural areas are typical of higher employment in primary and secondary sector (agriculture, industry and construction) and lower employment in tertiary sector – services. The employment rate of the Czech Republic decreased from 66.6% to 63% in period 2001-2011. There were minor differences between rural (65%) and urban areas (66.9%) in 2001, but values of employment rate are practically the same for both areas in present. Share of economically active persons

[74] https://www.euroskop.cz/8963/23237/clanek/reforma-spolecne-zemedelske-politiky-prosla-europarlamentem.
[75] http://www.europarl.europa.eu/pdfs/news/expert/infopress/20131118IPR25538/20131118IPR25538_en.pdf.
[76] http://www.europarl.europa.eu/pdfs/news/expert/infopress/20131118IPR25538/20131118IPR25538_en.pdf

in rural areas was practically the same as in urban areas in 2011 (49%), but this share reached only 47.6% in the smallest villages (less than 200 inhabitants)[77].

Problems such as higher unemployment rate (especially person in age more than 50 years and women), lower economic activity and less job opportunities in rural areas still persist. The reasons for higher unemployment rate are transformation and privatization processes that caused decline of employment by 60% in agriculture sector after 1989[78]. Although economic disparities between urban and rural areas are apparent, the situation can be different in certain locality. Differences are smaller especially in communities situated near areas with intensive housing construction[79]. This localities are well-known as satellite settlements. Altough there are almost equalable life condition in material and consumption aspects like in cities, functional social networks are hardly created, sometimes they are whole missing.

Agriculture can be considered as one of the important pillars of economic development in rural areas. Number of people employed in basic agriculture approached one million persons; it was almost 10% permanently employed persons in the national economy in 1989. However, the number of workers in agriculture sector gradually decreased and work productivity increased after 1989. Privatized enterprises could not employ the redundant workers. Share of permanently employed workers in agriculture declined from 9.8% (in 1989). This process still continues even after joining the European Union in 2004. Share of workers in agriculture within the labour force has decreased from 3.46% in 2004 to 2.60% in 2012.

Accession of Czech Republic into European Union has not stopped a growth of salaries that we have noticed after 1989. However, average gross salary in agriculture is lower than salaries in most other branches. Agriculture is characterized by wage disparity, wages in this sector amounted 78% of the average in 2012[80]. This disparity is caused by lower productivity of labour force in agriculture[81].

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[77] The Ministry of Agriculture of the Czech Republic, *Zpráva o stavu zemědělství ČR za rok 2012 (Green Report)*, 2013, p. 62

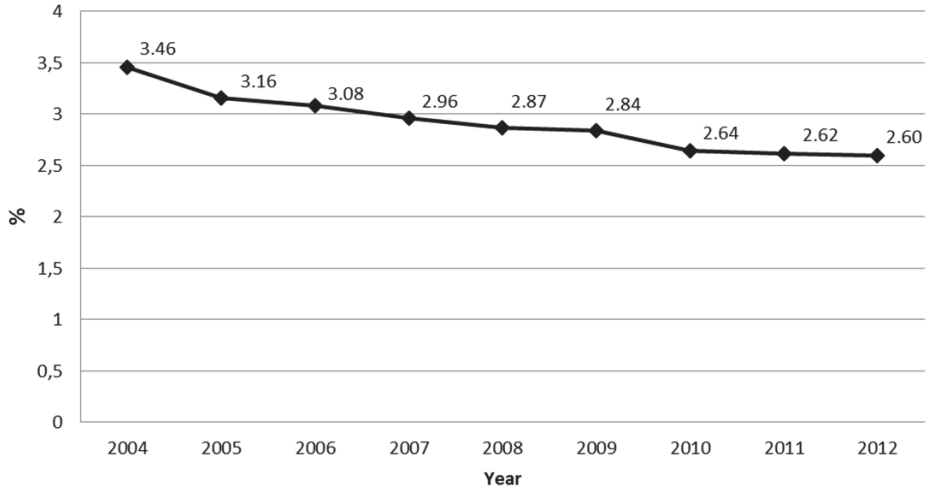
[78] Pělucha et al., *Rozvoj venkova v programovacím období 2007 – 2013 v kontextu reforem SZP EU*, Praha, IREAS, 2006, p. 29.

[79] Agrární poradensko informační centrum Agrární komory ČR, *Podpora sociálního začleňování, snižování chudoby a hospodářského rozvoje ve venkovských oblastech*.

[80] The Ministry of Agriculture of the Czech Republic, *Zpráva o stavu zemědělství ČR za rok 2012 (Green Report)*, 2013, p. 2.

[81] Pělucha et al., *Rozvoj venkova v programovacím období 2007-2013 v kontextu reforem SZP EU*, Praha, IREAS, 2006, p. 47.

Figure 2. Share of workers in agriculture within the labour force of Czech Republic 2004-2012



Source: The Ministry of Agriculture of the Czech Republic, 2012.

Although average gross salary in agriculture, forestry and fishing reached 20 010 CZK in 2012, what means an increase of 6 060 CZK since 2005, it still do not reach a level of national gross average salary. Economical significance of agriculture sector wanes in general, but it has still created a lot of job opportunitties in rural areas[82]. It can be considered as a problem especially for rural households, which are dependent on income from agricultural activities and have more household members than average household in Czech Republic[83].

Riding to work outside the village is typical solution of lack of job opportunities in rural areas. There are significant differences between urban and rural areas. Share of economically active population leaving village for a job was 70.7% in comparison to 25.3% in municipalities with more than 2 000 inhabitants[84].

[82] Agrární poradensko-informační centrum Agrární komory ČR, *Podpora sociálního začleňování, snižování chudoby a hospodářského rozvoje ve venkovských oblastech*.
[83] The Ministry of Agriculture of the Czech Republic, *Zpráva o stavu zemědělství ČR za rok 2012 (Green Report)*, 2013, p. 63.
[84] Pělucha et al., *Rozvoj venkova v programovacím období 2007 – 2013 v kontextu reforem SZP EU*, Praha, IREAS, 2006, p. 48.

Table 4. Average gross salary by branches

Year	Agriculture, forestry and fishing (CZK)	Industry (CZK)	Financial and insurance activities (CZK)	Professional, scientific and technical activities (CZK)	Education (CZK)	Summary (CZK)
2005	13 950	17 814	36 258	23 727	18 762	18 283
2006	14 802	19 010	38 687	24 742	20 008	19 447
2007	16 189	20 432	41 509	26 799	21 225	20 927
2008	17 909	22 167	44 629	30 364	22 233	22 653
2009	17 766	22 740	45 861	31 881	23 508	23 425
2010	18 092	23 649	45 638	31 928	23 349	23 903
2011	18 622	24 412	47 378	32 441	23 505	24 466
2012	20 010	25 159	51 351	32 771	24 389	25 112

Source: Czech Statistical Office, 2013.

The causes of lower economic activity of rural population are age and educational structure[85]. The lack of job opportunities leads to the fact that highly educated population moves to cities in order to get relevant work. Tertiary sector is not developed in rural areas due to absence of qualified labour force and low concentration of population. Agriculture is still decisive economic activity in some rural areas. In this context, it is appropriate to seek new sources of development and diversify income. Agrotourism is significant activity, which could improve an economic situation of rural population. Anticipated benefits of tourism development are new job opportunities and possibility of employment of non-qualified labour force. Estimated potential for another development of tourism relates up to 80% of territory of the Czech Republic[86].

2.5. Consumption change

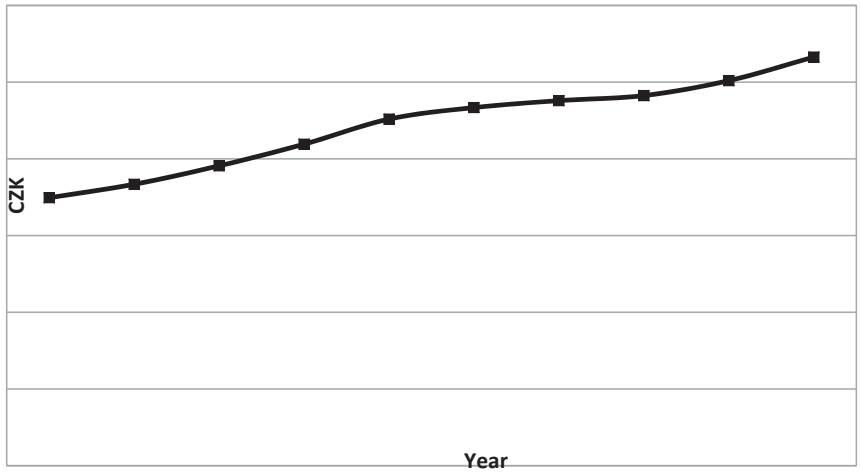
Seventies and eighties of the 20th century were to a certain extent prosperous for rural areas development. Agriculture belonged to supported braches of the national economy, wages were almost the highest, rural population predominantly lived in the own family houses and reconstructed farmsteads, plot and garden provided the additional market gains and fed the family as well as relatives by cheap and fresh foodstuff. Most of the household works, craft reconstruction and services were pursued by self-help or with the help of

[85] Agrární poradensko informační centrum Agrární komory ČR, *Podpora sociálního začleňování, snižování chudoby a hospodářského rozvoje ve venkovských oblastech*.
[86] Pělucha et al., *Rozvoj venkova v programovacím období 2007-2013 v kontextu reforem SZP EU*, Praha, IREAS, 2006, p. 48.

neighbours; household expenses were saved by this way. Majority of attractive goods was lacking on the market and an import from abroad was almost unavailable for common citizen. Requested wares (colour TV, freezers, washing machines, cars, bicycles etc.) were sold according to a long (several years) waiting list, were waiting in queue or were gained by corruption of shop--assistants. Installation of phone-line was being waited many years. Money was not spent for the expensive sporting goods, costly hobbies or travelling abroad. Cultural and social event costs were adequate to the rural space possibilities. A theatre performance or concert collective tours were organized to the cities. An admission of local cultural and social activity was symbolic. Transport network was very dense; driving fuel as well as bus and train fares were low. However, quality of roads and public transport means were poor.

Briefly, this era can be characterized as a period of relative sufficiency of financial means, which were not possible to spend. Goods in short supply was gained in queues, waiting lists or by corruption of shop-assistants. When the border was rather unblocked in eighties and it was possible to visit outland, the dissatisfaction grew.

Figure 3. Average salary in Czech Republic (2004-2013)



Source: Investia.cz, 2013.

Prices were identical in the Czechoslovakia before 1989. Shop price competition (which was only state or co-operative) did not exist. Price unblocking and retail competition after 1989 was surprising. Prices grew as well as wages. Target the last monitored ten years, grows of average wages continues (see Figure 3).

Table 5. Comparison of basic foodstuff and goods (2004-2013)

Product	Bread 1kg	Chick. 1kg	Milk 1l	Egg (pcs)	Butter 1kg	Men's cotton socks (a pair)	Postage for a letter	Theatre ticket
Price 2004 (in CZK)	15.25	51.80	14.35	2.47	115.48	44.20	6.50	144.12
Price 2013 (in CZK)	23.10	69.63	20.49	2.95	164.34	55.84	13.00	236,91
Amount of product bought from average salary (2004)	1 145	337	1217	7 071	151	395	2 687	121
Amount of product bought from average salary (2013)	1 153	383	1300	9 029	162	477	2 049	112
Percentage increase in the price (%)	51.5	34.4	42.8	19.4	42.3	26.3	100.0	64.3
Increase/ decrease in purchasing power	+ 8 kg	+ 46 kg	+ 83 l	+ 1958 pcs	+ 48.86 kg	+ 82 pairs	- 638 pcs	- 9 pcs

Source: Czech Statistical Office, 2013.

Comparison of basic goods prices between 2004 and 2013 shows that the price of all kinds of product gradually grow.

Offer advanced manifold, but the structure of purchased products and way of using services was changed above all. Manners of catering were altered; healthier alimentation is stressed. More expensive and high-quality products, including branded goods, are purchased. In the first years after 1989, it was rather a curiosity and experimentation at shopping of goods unknown and unavailable before. Consumption crystallises step by step and population gets used to a certain kinds of products. Of course, the advertising plays a huge role. Typical example is a high consumption of packaged water, which is (according to periodic controls) the same or sometimes worse quality than tap water. However, massive advertisement emphasizing the drinkable condition is always effective.

Nature of contemporary consumption, when to buy a new product is only slightly more expensive than reparation of old one, accelerates turnover of

goods. A negative result is a production of waste and expensive and laboured disposal or recycling of waste.

Rural areas are not distinct from towns as regards hard goods. Lower interest concerns using of specialized services (like fitness centres and new-fashion ateliers etc.). In the rural space, there are in a limited extent and as a rule in a worse quality (if any). There is a difference in the food consumption which is partially ensured from own gardens and plots.

2.6. Summary

There were shown examples of some human life spheres, where the significant changes have happened since 1989 and especially after 2004 to the present. We can ask what the most important conquests for population are. Unfortunately, there is no simple or unambiguous answer. Without doubt, the democratic development, unconceivable for previous generation, changes the prospects of people, who are able to compete in the labour market. Contemporary pluses are broad education possibilities, professional career, travelling, entrepreneurship and freedom of speech.

Statistical data reflect life standard and life possibilities growth. However, it is not concern of all inhabitants. Losers are those one who, from both objective and subjective reasons, cannot use all contemporary system advantages. Losers are in this case all citizens who have no effective legal means to influence the public life. An admittance of the CR into EU gives a certain warranty of democratic development, because Czech institution became a part of European institutional system. Negative specifics have not so big space in this system as in closed and interconnected environment of national policy. That is why we can consider the development after 1989 as predominantly positive.

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3. Human capital in rural areas in Poland ten years after the EU accession

3.1. Introduction

Since the second half of the last century, numerous social considerations have been influenced by the new economy. This concept is closely related to the impact of human factors on economic growth. Therefore, the growing importance of investments in people to attain the next stages of economic progress is typical of development of countries in the world. Education and healthcare expenditures are regarded in the literature as investments in the quality of human capital[87], whose potential increases by investing in people. The quality of human capital increases primarily through: education, in-job education and training of human resources, research, information gathering (including making them accessible) or through healthcare actions, which in turn affect the length of human life and vitality.

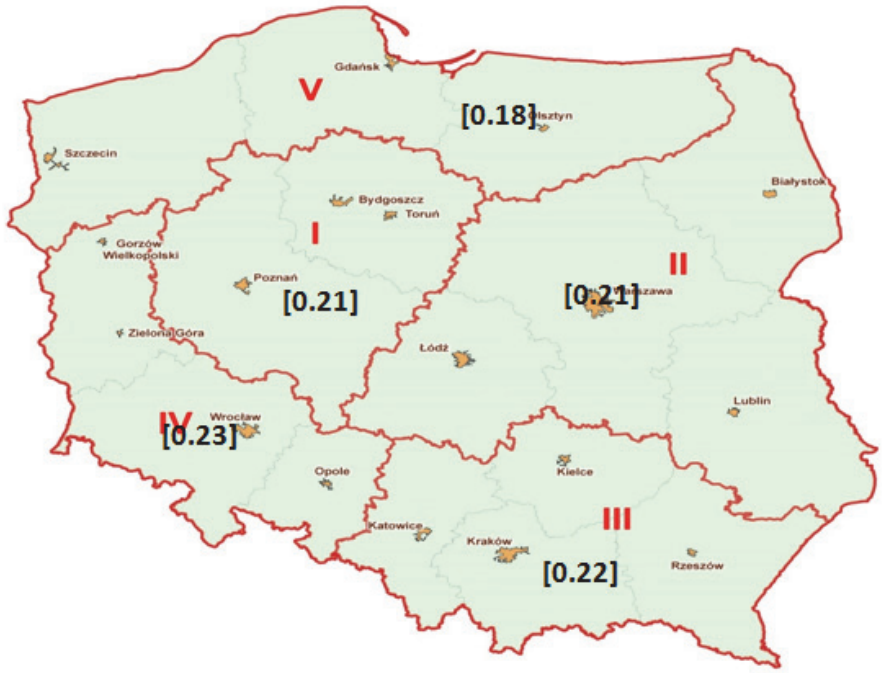
Since Poland's accession to the European Union, human capital in rural areas has significantly increased. Rectifying the shortcomings of civilisation (increase in the level of education and in the educational activity of the rural population), while fostering modernisation, increasing the average size of agricultural holdings, has been observed. Furthermore, emerging village de-agrarisation indirectly contributed to the gradual blurring of the differences in the standards of living of the rural and urban population. At the same time, the last decade has enabled the rural population to benefit from the EU funds, including the CAP instruments, and also enter the single EU labour market. In this context, knowledge or the skilful use of attributes and skills, and their development seem to be crucial.

The present study attempts to analyse the selected determinants of human capital formation on Polish rural areas over the last decade. It analyses the level of education, educational activity and civilisation competences of the rural population.

[87] It should be emphasised that human capital is a complex concept; therefore, it is difficult to define it clearly. Usually, its determinants are identified in the literature as follows: formal qualifications (level of education), skills, health, vital energy, and human civilisation competences.

Research material includes the CSO data and the IAFE-NRI survey results of 2011 (surveys were based on a sample of 8477 rural families, of which 3331 families had agricultural holdings with an area of over 1 hectare of agricultural land). The families were surveyed in 76 villages located in different regions of the country (Figure 1). The sampling was targeted and representative due to socio-economic features and the agrarian structure of agricultural holdings situated within the selected regions. All families residing in the villages selected were surveyed. The results of surveys carried out in 2000 and 2005 on a similar sample were used as a reference point to determine the dynamics of changes.

Figure 1. Location of villages covered by the IAFE-NRI survey by regions, including the sample size of individual holdings



* Marks and voivodeships corresponding to specific macro-regions are as follows:
Western Central (I) – Kujawsko-Pomorskie and Wielkopolskie voivodeships;
Eastern Central (II) – Mazowieckie, Lubelskie, Łódzkie and Podlaskie voivodeships;
South Eastern (III) – Małopolskie, Podkarpackie, Śląskie and Świętokrzyskie voivodeships;
South Western (IV) – Dolnośląskie, Lubuskie and Opolskie voivodeships;
Northern (V) – Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie voivodeships.
[...] – size of the sample surveyed expressed as the share of the actual number of individual holdings situated within a specific macro-region.
Source: IAFE-NRI survey of 2011.

3.2. Demographic conditions

Over the last decade, the population in the areas concerned has increased by almost half a million, the share of the pre-working-age population has decreased, while the share of the working-age population has increased. The ageing of society has become a clearly visible process.

In accordance with the CSO data, about 39.4% of the Polish population, i.e. 15.5 million, inhabited rural areas in 2012, which is almost 613 thousand more (i.e. about 4.2%) than in 2000. What is more, a significant increase in the number of the rural population was observed mainly after Poland's accession to the EU. Despite an increase in the absolute number of the rural population in 2004-2012, its share in the total population increased very slightly (Table 1).

Table 1. Rural population in Poland in 2000-2012

Item	2000	2005	2012
Population ('000)	14 584	14 733	15 197
Share of the national population (%)	38.1	38.6	39.4
Median age	33.5	34.8	36.6
People aged at least 65 per 1000 children aged 0-14	604	720	759
Non-working-age population per 100 working-age people	76	65	58
Share of:			
Pre-working-age population	27.6	23.8	20.7
Working-age population	56.8	60.8	63.4
Post-working-age population	15.6	15.4	15.9

Source: Based on the CSO data of 2005-2013.

A steady increase in the length of life expectancy is a positive sign of demographic change in Poland. In 2012, female and male life expectancy in urban and rural areas increased by nearly 2 years compared to 2004. These rates are even higher compared to previous years. For example, compared to 2000, female life expectancy in rural areas increased by 2.5 years and male life expectancy – by 2.2 years. No significant differences in the life expectancy of the urban and rural population were observed. The life expectancy of women and men born in rural areas in 2012 is 80.9 years and 71.6 years, respectively.

While life expectancy in rural areas has increased, the number of children up to 14 years of age has decreased. In 2005-2012, their number fell by 208.7 thousand. As a consequence, 2575.9 thousand children (up to 14 years of age) and 1954.7 thousand people aged 65+ lived in rural areas in 2012. Although the number of people aged 65+ per 1000 children (up to 14 years)

increased by 39 people in 2005-2012, the increase was much slower than in 2000-2005 (Table 1).

From the point of view of the impact of demographic conditions on the domestic economy, important are both a breakdown of the total population by age, and changes in the ratio between different groups of people of working and non-working age. In 2012, the pre-working-age population in rural areas accounted for 3.2 million, representing 44.8% of the Polish population in this age group. The share of people of pre-working age in the total rural population was 21.1%, which means a decrease in this age group by 3.4 percentage points as of 2004 and by 6.5 percentage points as of 2000. Despite the significant decrease in the share of children and youth, the share of this population group in the Polish rural areas was still higher than in urban areas[88].

A decrease in the share of people under 18 in the total population in both rural and urban areas observed in recent years was also due to reaching the working-age by people born in the early 1980s, i.e. during the baby boom.

In 2012, almost 9.6 million people of working-age lived in rural areas, which means that their number increased by 755 thousand (8.6%) compared to 2004, and by 1307 thousand (15.8%) compared to 2000. Such a growth in the number of people aged 18-59/64 increased their share in the total rural population (by 6.4 and 3.2 percentage points in 2000-2012 and 2004-2012, respectively).

Although only 38.7% of the Polish working-age population lived in rural areas, its growth in recent years has been mainly due to the rural population[89].

In 2012, the post-working-age population in rural areas amounted to almost 2.4 million, which accounted for about 36% of the Polish population in this age group. The share of people aged 60/65+ in the rural population was close to 15.6%, which did not differ significantly from their share in the urban population (nearly 18.3%), and was similar to the share recorded in rural areas in 2004 (15.5%) and 2000 (15.6%).

When assessing the impact of the demographic characteristics of the population on economic conditions, the dependency rate indicating the total number of younger, i.e. under 18 years of age, and elderly people, i.e. aged 60/65+, per 100 people of working-age is usually applied. In rural areas, this rate was 58 in 2012, which means that it has decreased by 9 points since 2004. The burden of non-working-age people decreased due to a higher number and share of

[88] Share of the pre-working-age population in urban areas in 2012 was lower by as much as 3.19 percentage points than in rural areas, although in absolute terms the number of children and youth in urban areas was higher by almost 749 thousand than in rural areas.

[89] In 2004-2012, the working-age population in rural and urban areas increased by 755 and 256 thousand, respectively.

people of working-age observed in recent years. Dependency rates calculated for the rural population were higher than in urban areas (58 compared to 54 in 2012), which means that the burden of non-working people remains lower in urban areas than rural areas throughout the analysed period. These rural-urban differences in dependency rates resulted from the different shares of people of working age. In 2012, the share of people aged 18-59/64 in urban areas reached 64.8% and was higher by 1.6 percentage points than in rural areas.

In accordance with the CSO data, there were 101 women per 100 men in 2012 (as in 2004). Thus, a gender balance was observed in rural areas, rather than urban areas, with 111 women per 100 men. The gender balance related to the total rural population; however, there were differences between specific age groups.

Similarly to the urban population, the predominance of men over women was visible in younger age groups. In the case of the rural population, the predominance of women started in the 55-59 age group, whereas in the case of the urban population this phenomenon was noticed as early as in the 35-39 age group. As a result of the longer life expectancy of women than men on average, feminisation rates were significantly higher in older age groups. In 2012, there were 139 women per 100 men in the 70-74 age group in rural areas, while among people aged 80+, the analogous rate was as high as 236.

3.3. Level of formal education

The level of education of the population, including the rural population, should be addressed on many levels. Due to the nature of activities carried out in agricultural holdings, the farmers' scope of work can be seen in many aspects, which may be of natural, social, economic or technical character. Running holdings requires also the knowledge of social and political relations, legislation and the mode of operation of both the government, and entities involved in supply and purchase. This knowledge is essential to farmers not only as a basis for participation in public life, but also as a condition for determining the development opportunities of their holdings. Political, administrative and social knowledge during such periods as systemic changes, is crucial in adapting own business to changing conditions.

For many years, substantial educational disparities have existed between the rural and urban population. Nevertheless, educational aspirations increase in both rural and urban areas. In 2012, as in the past years, the share of rural population with at least secondary education was lower, and those with higher education – more than twice lower, compared to urban areas (Table 2).

Table 2. Level of education of the rural and urban population aged 13+ in 2002-2012 (%)

Year	Primary	Lower secondary	Basic vocational	Secondary and post-secondary	Higher
Rural areas					
2002	38.3	x	29.2	22.4	4.3
2004	31.9	5.8	29.4	24.5	5.4
2012	25.6	6.0	26.5	25.5	9.9
Urban areas					
2002	22.2	x	21.1	38.5	13.7
2004	16.8	4.4	21.3	38.0	17.5
2012	13.7	4.3	18.5	35.3	21.4

Source: Based on the CSO data of 2005-2013.

However, it should be noted that these disparities reduced in 2004-2012, compared to previous years. In accordance with the surveys, in 2012 slightly more than one-third of the population aged 13+ (35.4% of the population), living in rural areas, had secondary, post-secondary or higher education (almost every tenth person had higher education). Compared to 2004, the share of people with the above-mentioned level of education increased by 5.5 percentage points (those with higher education – by 4.5 percentage points). At the same time, the share of the population with primary education in the educational structure of the rural population significantly decreased. It must be assumed that this phenomenon was strongly associated with changes in the demographic structure, as this level of education was typical of interwar students. All these positive changes are even more evident in comparison with 2002. They were observed in relation to both rural women and men (Table 3).

Table 3. Level of education of the rural population aged 13+ in 2002-2012 by gender

Year	Primary	Lower secondary	Basic vocational	Secondary and post-secondary	Higher
Men					
2002	36.2	x	37.1	18.9	3.6
2004	29.4	5.9	37.2	21.7	4.7
2012	23.5	6.5	33.6	23.1	7.7
Women					
2002	41.7	x	20.7	24.8	4.9
2004	34.4	5.7	21.6	27.2	6.1
2012	27.8	5.5	19.6	27.9	12.1

Source: Based on the CSO data of 2005-2013.

Table 4. Level of education of the population in agricultural and non-agricultural families in 2000-2011 (%)

Year	Lower secondary and primary	Vocational	Secondary and post-secondary	Higher
Agricultural population				
2000	41.7	39.2	17.0	2.1
2005	34.4	37.4	23.2	5.0
2011	24.9	30.7	32.1	12.3
Non-agricultural population				
2000	39.5	38.8	18.1	3.6
2005	36.1	36.1	22.5	5.3
2011	26.8	33.1	29.1	11.1

Source: Based on the IAFE-NRI Survey.

The IAFE-NRI surveys reveal that an increase in the level of education was noticed in relation to both rural communities at issue, i.e. agricultural family members – having an agricultural holding with an area of over 1 ha of agricultural land, and non-agricultural family members, who either have had no agricultural holding or its size was less than 1 ha of agricultural land (Table 4). It should be noted that positive changes in agricultural families were relatively greater.

Although recent years have brought positive changes, including doubling of the share of the rural population with higher education, differences in relation to the urban population have remained significant. In accordance with the surveys, career plans, associated with activity in the non-agricultural sectors of the economy in rural areas and nearby urban areas or abroad, were the main factors boosting the educational aspirations of rural youth.

It should also be noted that non-public educational institutions are crucial in raising the level of education of the rural population. Many schools were located in the centre of rural areas, resulting in easy access for rural youth.

3.4. Improving the knowledge and civilisation competences of the rural population

Socio-economic changes, decreasing demands of the labour force, and wider use of machinery make the rural population turn away from agriculture and search for alternative activities in order to achieve economic satisfaction. This situation necessitates raising the level of vocational and general education. Therefore, understanding a need for further education and training, including in non-agricultural aspects, by the rural population is of enormous

importance, as multifunctional rural development makes it necessary to incorporate a growing number of non-agricultural functions into rural areas. This provides opportunities for alternative sources of income. Usually, the less educated rural population is characterised by low economic and cultural activity, as well as scarce entrepreneurial activity, which also hinders the possibilities of multifunctional rural development. However, the development of non-agricultural fields of economic activity requires the ability to search for information, establish contacts with clients, customers, markets, etc.

The role of knowledge, also with regard to the Polish farmers, is all the more significant, because competition with other EU Member States is fierce and modern agriculture, increasingly intense and precise, is becoming a knowledge-intensive industry. In this situation, farmers with no proper education and no possibility of further education can hardly meet modern economic requirements in order to find themselves in a changing world. Farmers lacking skills or being late with the implementation of technological advancements cannot exist in the market. Producers wishing to develop their businesses will have to retain their clients and prevent them from being attracted by other farmers. Therefore, they will need market research skills, knowledge how to establish contacts with customers and how to create their own brand. Changing economic conditions and the progress of civilisation necessitate such actions. From the point of view of the economic theory, commitment to improving qualifications is one of the most important types of investments in human capital, which has a direct impact on both the level of income, and relatively lower employment insecurity. It is especially important for middle-aged and elder people, who have been economically active for many years. This is why it is so important for adults to engage in educational activity. It should be noted that, nowadays, people should acquire and develop knowledge throughout their professional lives. However, the educational activity of adults in rural areas, defined as the participation of the 18+ population in various forms of education, is much lower than in urban areas (Table 5).

In fact, the growth rate of the share of the urban population aged 20-24 and engaged in further education was even higher, and the stabilisation of the share of the rural population in the same age group further widens the gaps in the structure of education of the population, which are already unfavourable for rural areas.

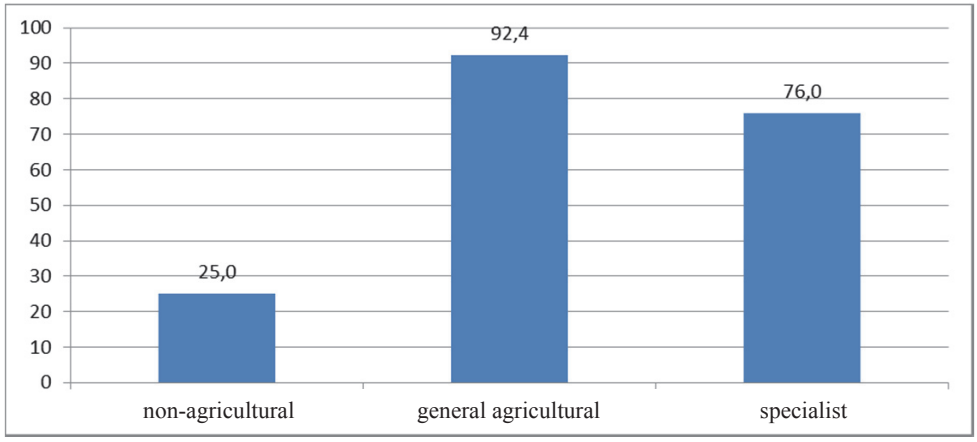
Table 5. Educational activity of adults in 2000-2013 by place of residence

Year	Share of people benefiting from in-school and out-of-school education			
	aged 20-24	aged 25-29	aged 30-39	aged 30+
Rural areas				
2000	26.0	7.1	0.3	0.3
2005	50.8	8.9	1.8	0.9
2013	48.0	8.5	2.7	0.8
Urban areas*				
2000	61-46	17-9	5-2	0.5-1.3
2005	70-54	25-18	11-6	3.2-0.8
2013	79-53	20-17	9-5	2.1-1.5

* extreme scores used for: cities and towns with population of over 500 thousand and less than 20 thousand, respectively.
Source: Based on the Social Diagnosis.

All kinds of courses are a traditional form of out-of-school education in rural areas. In 2005-2011, they were held in every fifth surveyed village. Our surveys revealed that especially the agricultural population is highly interested in this form of education. One-quarter of participants of non-agricultural courses were agricultural family members and their share in organised specialist courses and general agricultural courses was 75.0% and 92.4%, respectively (Figure 2).

Figure 2. Share of agricultural family members among participants of different types of courses in surveyed villages in 2011

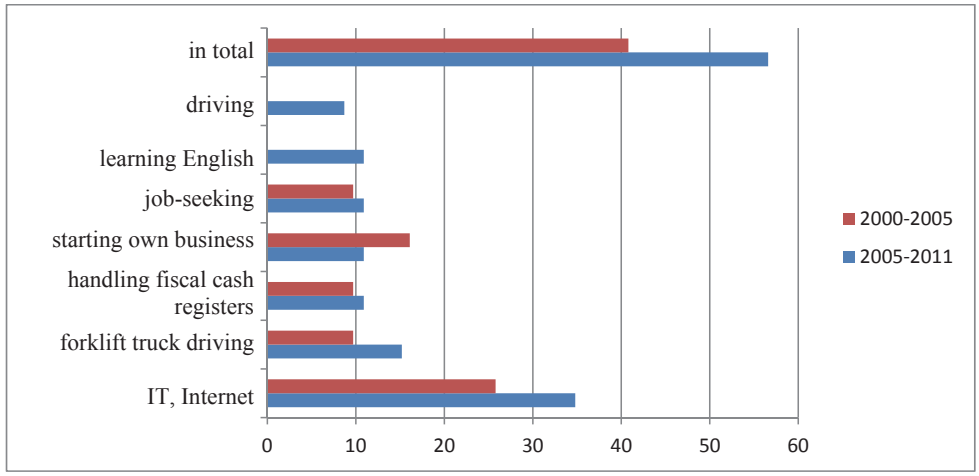


Source: Based on the IAFE-NRI Survey.

Furthermore, over half of the villages offered courses or trainings for the unemployed. This share increased significantly by 16.6 percentage points compared to the previous survey period (Figure 3). IT courses were the most common

(held in over one-third of the villages). Every tenth village offered English courses, courses related to launching one's own business, and active job-seeking. In general, almost every fourth unemployed participated in such activities.

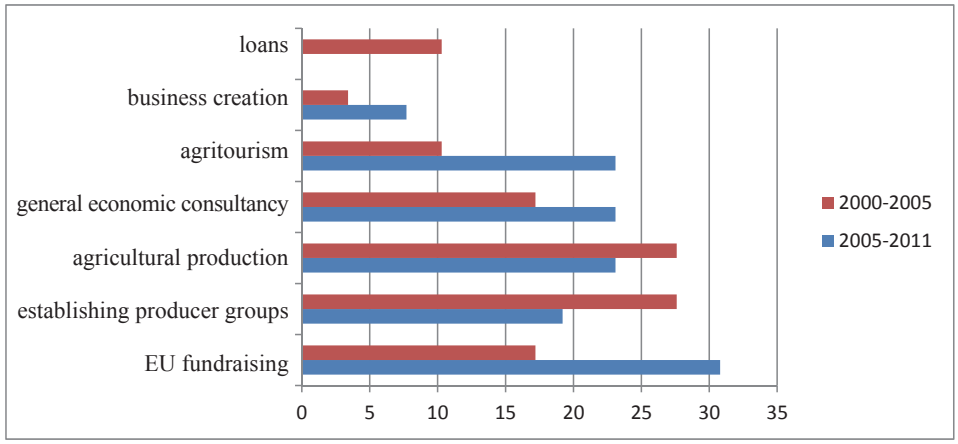
Figure 3. Percentage of surveyed villages offering courses for the unemployed



Source: Based on the IAFE-NRI Survey.

Despite these trainings and courses organised for both the unemployed and the remaining rural population, respondents reported a need for further educational activities (Figure 4). Almost every third village reported a need for the EU fundraising, every fourth agritourism farm – for general economic and agricultural production consulting.

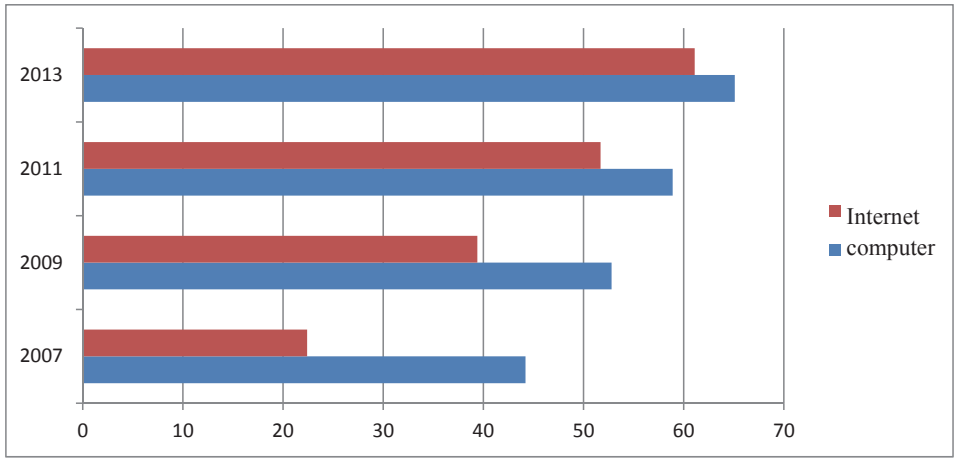
Figure 4. Share of surveyed villages reporting a need for specific consulting services



Source: Based on the IAFE-NRI Survey.

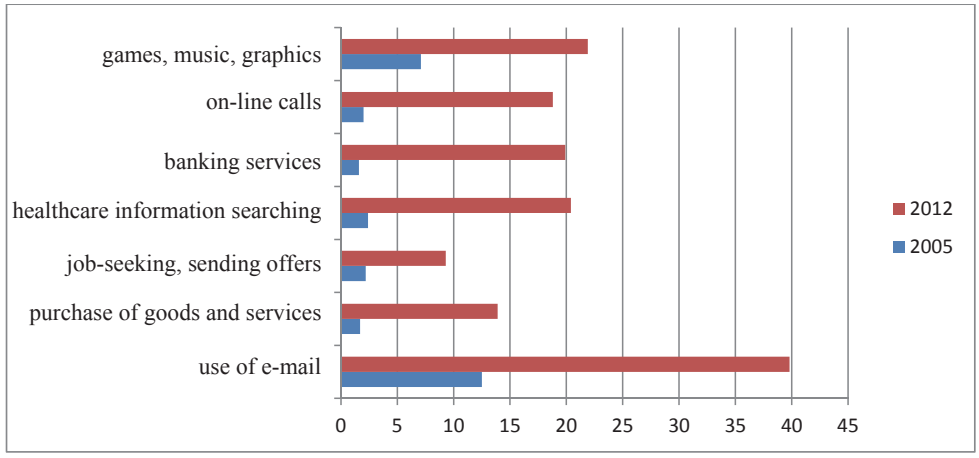
Access and ability to use new technologies are one of the main determinants of adaptation to function in the contemporary society. The share of households having computers and Internet access significantly improved in the analysed period (Figure 5).

Figure 5. Share of rural households having computers and Internet access in 2007-2013



Source: Based on the CSO data.

Figure 6. Share of rural population aged 16-74 using the Internet in 2005 and 2012 by purpose



Source: Own elaboration Based on the CSO data of 2013.

In 2013, almost two-thirds of rural households had computers. Almost all of them had Internet access. In the last decade, the share of both rural population and farmers who use the Internet has significantly increased.

An analysis of the purposes of using the Internet (Figure 6) by the rural population clearly demonstrates the increasing share of people using e-mail, on-line banking, instant messaging services or using it to search for relevant information, e.g. on healthcare.

Foreign languages are another determinant of adaptation to the changing reality. In recent years, the share of the English- and German-speaking rural population has increased. Surveys of 2011 showed that 11.3% of the total rural population can speak one foreign language (Table 6).

Table 6. Share of respondents speaking foreign languages in 2011

Foreign language	Agricultural families	Non-agricultural families	In total
One language	11.0	11.5	11.3
English	7.8	7.9	7.9
German	1.8	2.1	2.0
Russian	1.0	1.1	1.0
Other	0.4	0.4	0.4
Two languages	2.0	2.7	2.4

Source: Based on the IAFE-NRI Survey.

English was the most common language (7.9% of the population). However, the next one was German (only 2% of the rural population could communicate in this language). Slightly more than 2% of the rural population could speak two foreign languages. Data on foreign languages both in agricultural and non-agricultural families were comparable. Foreign language farmers can easier establish trade relations. In particular, Russian[90], which is relatively common among farmers, facilitates their trade relations with Eastern neighbours.

3.5. Conclusion

In the present situation, when human capital is playing an increasingly important role in shaping the economic development processes, education is gaining importance both as regards general transformations and in the individual aspect, determining individual's chances to succeed in the labour market, satisfy professional and cultural aspirations. Regardless of the type of necessary skills, education is based on school education.

[90] In accordance with the Social Diagnosis data of 2005 and 2007, 33.8% and 41.8% of farmers, respectively, declared active and passive knowledge of Russian.

An increase in the level of education has been especially evident among other positive changes in rural human capital over the past decade; in particular, with regard to higher and primary education. In 2012, nearly every tenth rural resident was a holder of a university degree. However, differences in relation to urban residents were still observed.

The IAFE-NRI surveys reveal that an increase in the level of education was noticed in relation to both rural communities at issue, i.e. agricultural family members – having an agricultural holding with an area of over 1 ha of agricultural land, and non-agricultural family members, who either have had no agricultural holding or its size was less than 1 ha of agricultural land.

It should be noted that the positive changes in agricultural families were relatively greater.

An efficient system of education is highly influenced by proximity to educational institutions. Compared to 2005, the school proximity index has further deteriorated slightly.

From the point of view of the economic theory, commitment to improving qualifications is one of the most important types of investments in human capital, which has a direct impact on both the level of income and relatively lower employment insecurity. It is especially important for middle-aged and elder people, who have been economically active for many years. This is why it is so important for adults to engage in educational activity. It should be noted that, especially in rural areas, their share has increased significantly. In 2013 compared to 2000, it almost doubled as regards the 20-24 age group, and increased in the 30-39 age group. Although this share remains much lower than in urban areas, the rate of change in rural areas was higher than in urban areas.

Surveys showed that residents of almost every fifth surveyed village gained out-of-school qualifications in 2011, as a result of participating in non-agricultural vocational courses and general agricultural courses. The participation of the population in specialist courses was declared in almost every eighth village.

All kinds of courses are a traditional form of out-of-school education in rural areas. In 2005-2011, they were held in every fifth surveyed village. Our surveys revealed that especially the agricultural population is highly interested in this form of education. One-quarter of participants of non-agricultural courses were agricultural family members.

It should be noted that the rural population reported a need for courses related to new forms of activity, rather than trainings directly related to agricultural production, which means less demand for agronomic knowledge and more focus on contemporary issues.

In the last decade, the share of both rural population and farmers who use the Internet has significantly increased. More and more people use e-mail, on-line banking, instant messaging services or search the Internet for relevant information, e.g. on healthcare.

Better social situation (mainly the level of education and educational activity at large) of the rural population not only involves a civilizational dimension, but also takes in economic aspects as well, because it directly affects: the intensity of production, openness to innovation and economic effectiveness.

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4. Achievements and challenges in rural areas of Serbia before joining the EU[91]

4.1. Introduction

Classification of settlements on rural and urban areas is carried out in accordance with the specific conditions and needs, based on which countries choose specific criteria for the classification of types of settlements, because in this area there is no general criterion. According to the OECD definition of rural areas, there are two levels of territorial units: 1 local; 2 regional. OECD defines rural areas at the local level in accordance with the density of population to the village with a population density below 150 inhabitants/km². On the other hand, at the regional level, the OECD recognizes the greater functional and administrative units, depending on the share of population living in rural communities with a total population of a given region:

- regions where over 50% of the population lives in rural communities – mostly rural regions;
- regions in which 15 to 50% of the population lives in rural communities – significantly rural regions and transition regions;
- regions where less than 15% of the population lives in rural communities – mostly urban regions[92].

The Republic of Serbia does not have an official definition of rural areas, since it has not been made synchronization with EU geocode standards which divided Europe into administrative regions (so-called NUTS regionalization). Republic Statistical Office (RSO) does not use indicators of rurality known in international practice, such as: number of inhabitants, population density, the share of agricultural population and so on. According to this approach, the rural areas are parts of the country which are residual of urban areas. This classification based primarily on municipal decision that a settlement awarding the status of urban settlement on the grounds that you have a general urban plan. This

[91] This paper work is result of the project No. 46006 – III *Sustainable agriculture and rural development in function realizing strategic goals of the Republic of Serbia in framework of Danube region*, financing by the Ministry of Education and Science of the Republic of Serbia in period 2011-2014.

[92] Bogdanov N. (2007), *Small rural households in Serbia and rural non-farm economy*, UNDP, Beograd, p. 39.

hampered the analysis of statistical indicators of rural areas in Serbia. Consequently, until NUTS is fully implemented, the application of modified SBS categorization will be required, in which rural areas include all territories except 24 cities, whose status is defined by the Law on Territorial Organization of the Republic of Serbia[93]. For the reason that agricultural production recorded in some municipalities of Belgrade and Niš, in this two cities has been applied previously mentioned OECD classification of rural areas[94].

Rural areas in Serbia cover 65 952 km², while there are 3904 rural areas with an average population density of 63,10 inhabitants/km²[95]. According to the Census 1991, and 2002, the population of rural areas decreased from 4 319 463 to 4 161 660 (96,3% of the population in 1991, respectively).

4.2. The physical infrastructure of rural areas

Rural areas are characterised by underdeveloped physical infrastructure. Per thousand inhabitants of this areas is recorded 284 telephone connections and also indicator number of citizens/physician is 511,92, which is far less than national average (369,30)[96]. Access to the road network, electricity, fixed and mobile telephone network has about 80% of rural areas, while water supply, gas, sewerage and garbage dumps are much less present. In these areas, utility infrastructure is neglected and underdeveloped, and as such does not meet the needs of the rural population. Over the past 10 years, investments in municipal infrastructure have been focused on the new systems and the expansion of existing ones, and less on maintenance of existing situation. Investment in new systems or network expansion is usually registered in telecommunication systems, on the other hand, gasification and organized disposal characterize the smallest investment. In the plains areas, infrastructure is largely repaired and restored, and in the mountain areas have been built new. In terms of priority problems of the rural population is indicative a few of conclusions[97]:

1. In comparably greater dissatisfaction of households expressed with communal problems than the available services;

[93] Law on Territorial Organization of the Republic Serbia voted 28.12.2007., Official gazette: 129-07; http://www.parlament.gov.rs/content/lat/akta/akta_detalji.asp?id=466&t=z#.
[94] In rural areas are affected municipalities Barajevo, Sopot and Surčin from Belgrade and Nis Nis Spa.
[95] Republic Bureau for Statistics RS, http://webrzs.stat.gov.rs/axd/index.php.
[96] Republic Bureau for Statistics RS, http://webrzs.stat.gov.rs/axd/index.php.
[97] Bogdanov, N. (2007): *Small rural households in Serbia and rural non-farm economy*, UNDP, Belgrade, p. 139.

2. Also, the lack or disorganization of economic infrastructure are relatively evaluated as a problem, which made that it seems to be consequence of their lack of knowledge of that kind of services rather than lack of need for them;
3. Regional differences are obvious, and they point to the growing dissatisfaction of households in the lowland regions, but also they point out that the nature of the problem of households is different in some of the areas. For lowland households, water and health services, are bigger problem than for the others, but also problems such as: unemployment, living standards, neglect of rural areas, the lack of cultural events etc. Households in the region of large urban centres have a greater problem with services related to agriculture. In addition to paved roads, they have a greater need for better purchasing prices and cooperative than households in other parts of Serbia.

Programs of rural development support can have a significant effect if they focused on competitiveness, innovation and employment in rural areas. The introduction of local rural development strategies (LEADER approach), through encouraging interests of local people for their active participation and the creation of local action groups (LAG), social capital in these areas can be significantly increased. Agricultural Council of the EU adopted in September 2005 fundamental reform of rural development for the period 2007-2013[98]. The new rural development policy set LEADER initiative as a leading approach in distributing support and significantly simplified procedure. Following "axis" have been characterized it until the end of 2013: Improvement measures, i.e. measures which increase the competitiveness of the agricultural sector; improving the environment and countryside through support for land management; economic diversification and improving the quality of life in rural areas; so-called "horizontal" component or fourth axis of funding and implementation of rural development – LEADER approach. Integrative approaches to local development have in the past proved useful, especially in terms of building local capacity and assists government agencies and the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia. The positive impact reflected primarily in the creation of appropriate support measures and better assessment of the effects of certain measures of local development.

[98] Regulation EC, No. 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EARDF), in the EC and the Community strategic guidelines for rural development (programming period 2007-2013).

4.3. Age and educational structure of rural areas

Except negative quantitative tendencies, it is evident unfavourable age structure of the population. The share of the population over 65 years is 17,49%, and under 15 years 16,17%, while the rate of aging of 1,08. Also, so-called rate in-out migration is negative (-0,14). These trends in the number, structure and migration of the rural population are the result of unfavourable living conditions, underdeveloped rural economy, but also the low representation of women in reproductive age. The most appropriate response to the appearance of an aging population is equitable and sustainable economic growth of the society[99].

The educational structure of the rural labour force does not meet the requirements of the labour market. The educational structure of the rural population over 15 years is this: no formal education 28,19%; with primary school 26,69%; with secondary education 36,09%; higher education 6.95%; unknown 2,07%. Also, most of the rural population did not attend training courses and there is no sufficiently specific knowledge and skills. Rural areas are therefore deprived of investments that require skilled and efficient workforce. At the same time, due to the unfavourable economic environment educated labour powers migrate to urban areas. Improving knowledge and skills of the population in rural areas is a strategic interest of Serbian agriculture, because competitive advantage in the modern economy cannot be built on the exploitation of natural resources and cheap labour force.

4.4. The economy of rural areas

The economy of rural areas, however, is based precisely on the depletion of natural resources and high dependence on the primary sector, especially from agriculture. Rural areas cover 85% of Serbian territory, and 55% of the population lives in these areas, it forming 41% of the GDP of the country[100]. The economic structure of rural areas in Serbia, according to the Republic Statistical Office is the following: primary sector (32,48%); secondary sector (41,12%); tertiary sector (26,06%); public sector (0,34%); unknown (0,34%). At the same time, the share of agriculture in GDP in rural areas is 29,81%, which is significantly higher compared to other countries in transition, for the reason that Serbia has significant resources for agricultural production.

[99] National Strategy on Ageing 2006-2015.
http://www.srbija.gov.rs/vesti/dokumenti_sekcija.php?id=45678 (17.04.2014.)
[100] Bogdanov N., (2007), *Small rural households in Serbia and rural non-farm economy*, UNDP, Beograd, p. 31.

However, the low living standard of farmers is the result of low productivity and intensity of agriculture in Serbia. According to the methodology RSO (Serbian=100%), productivity in the primary sector in rural areas is 87%, in the secondary 74,93%, and in tertiary 62,48%, and is significantly noticeable lag to productivity at the level of the country.

The share of agriculture in total employment in Serbia is around 20%, and Serbia is ranked among very agrarian countries[101]. It is present a decrease of this indicator, but not at the same extent as in other countries which are in process of transition, which is a consequence the slow restructuring of enterprises in Serbia and reforming the national economy, which resulted in unfavourable situation on the labour market and high unemployment.

Besides, the Serbian labour market is characterized by high hidden unemployment and low labour mobility. On the other hand, the labour market in rural areas is characterized by: a low representation of the private sector, unfavourable age and educational structure in relation to the total population, rising unemployment economically active population, employment in the primary sector is high and tertiary low. The sectoral structure of employment in the rural areas of Serbia is as follows: the primary sector (32,98%); secondary sector (30,69%); tertiary sector (18,60%); public sector (14,84%); unknown (2,89%). In the revenue structure of small rural households in Serbia most represented are income from employment outside of agriculture, the sale of agricultural products and income from pensions[102]. The structure of employment and income for rural populations indicates that in Serbia is dominated by "imposed" diversification of income, which is result from the unfavourable economic environment and poverty. In fact, the largest share in the total income of the rural population of all the areas have salaries, followed by the earnings from agriculture. This data shows a disproportionate ratio of people employed in agriculture (45%) and its share in total household income (25%), which confirms the low realized productivity of agriculture. Economic development of rural areas means a much broader area of agriculture, and the goals of policies and rural development measures do not relate exclusively to farms and producers. According to Article 12 of the Law on Agriculture and Rural Development "rural development measures are type of incentives that encourage improvement in the competitiveness of agriculture and forestry (investment in agriculture and forestry and the introduction of new standards in the production and trade of agricultural products), improvement to programs of environmental protection, biodiversity

[101] *Labour Force Survey 2008*, National Bureau of Statistics, The Republic of Serbia.
[102] Bogdanov N., (2007), *Small rural households in Serbia and rural non-farm economy*, UNDP, Belgrade, p.32.

protection, and also programs of diversification rural economy and improvement in quality of rural areas"[103]. Namely, rural development assumes various socio--economic activities that are defined by rural policy and focused on rural areas. They should contribute to improving the quality of life and economic activity in rural areas, primarily through investment in the assets of agricultural production, construction and maintenance of rural infrastructure, training and education of the rural population, promotion of traditional and cultural values, environmental protection and the environment, rural development tourism and others.

Development of farmers in rural areas means their full integration into the system agrocomplex of Serbia. Modern agricultural production is characterized by a high dependence of all segments of the agro-complex which is an important subsystem of the national economy and that includes: (1) industry means for agricultural and food production; (2) the primary agricultural production; (3) the industry for processing agricultural products (in finished industrial food and industrial non-food products); (4) trade of agri-food products and (5) final consumption of food. The main feature of this great subsystems is complexity of functional connections and relationships of interdependence between the individual segments. The disintegration of the agro industrial conglomerates in the 90s of the last century created an institutional and organizational unregulated markets for agricultural products in Serbia. Through the process of privatization of processing capacity and strengthening food retail chains have created basic presumption for development agricultural product markets. In food production in Serbia exist a relatively well-rounded production and income chain only in the production of industrial crops, fruit and vegetables, milk, etc. These parts of system have a stable placement in the domestic and international markets and which have been privatized in the early stage of privatization process. However, the market of grain and meat has not achieved full stability yet.

Contribute to the development, in rural areas, and the entire Serbian economy can be achieved through process of interest joining farmers. One of the major barrier to improve the competitiveness of agricultural production farms in rural areas is fragmented and spatial dislocation of their property land. This brings into question the position and existence of small and medium-sized farms in the market, and through interest-based association of farmers, make possibility for survival in market condition. However cooperatives, as a form of association of farmers, are faced with the following global issues: inadequate legislation; lack of fiscal policy and other measure of support cooperatives as a specific form of business; small working capital and inability to apply for loans; ignorance of the basic cooperative principles; lack of

[103] *Law on Agriculture and Rural Development*, Official Gazette of RS, No. 41/09th.

management skills and knowledge. Despite these difficulties, the cooperative is a model that would allow stabilize agricultural markets and reduce business risk for agricultural production of small farms in rural areas, and in that sense should support their revitalization.

Most of small rural farms (50%), evaluate their living standard as average. However, 41% of them believe that their living standard is poor or very poor, while only 10% of households rated their condition as better than average[104]. One of the main characteristics of poverty in Serbia is poverty among the rural population. Highly vulnerable are following categories: farmers who are engaged exclusively in agriculture, farmers who are engaged exclusively in agriculture and receive income only in these area of business, the elderly and pensioners, women, youth, displaced persons.

The main causes of poverty of agricultural holdings are reflected in disadvantaged ownership structure, underdeveloped capital markets, inadequate human resources and lack of diversification of income and activities. There is a trend increase in the share of holdings of medium size (1-5 ha) among the poor categories of households, which is caused by the strengthening of the dual structure of agriculture. Also, as a reason for the unfavourable position of medium-sized farms, appears impossibility of achieving their market competitiveness. In parts of Serbia with strong adverse demographic indicators, i.e. rural areas located in the eastern and south-eastern parts of the country, there is a more intense rural poverty.

4.5. The agricultural land

The ownership structure of agricultural land in the period after 2000 was characterized by the conversion of state/public property into private. At the same time, between private landowners, trade was not significant. Large estates were bought, which have the necessary infrastructure, facilities and machinery, while private estates and small house holdings were subject to significant trade. During the same period, the ownership structure of agricultural land has become very complex. Become apparent micro farms owned by poor farmers or heirs returned the land, then a small family farm and mixed farms, large estates, family or property of the transition layer elite. The highest numbers of households (75%) have been producing for their own needs, and only 20% have market share (2002 census). The largest part of the agricultural land is privately owned (67%), followed by state (30%), social (2%), while in the cooperative, mixed

[104] Bogdanov N., (2007): *Small rural households in Serbia and rural non-farm economy*, UNDP, Belgrade, p. 131.

and others (1%)[105]. In the ownership structure is dominated by small households with a significant share of raw land; while dual structure of farms are evident in areas where developed land trade; especially rental market: Vojvodina, Danube river region etc. Based results of the Living Standards Survey (LFS) which carried in 2002 and 2007, it can be observed following trends in market indicators of land in Serbia:

- increased the share of households that give land on lease from 9,2% to 6% (index 2007/2002 = 65);
- increase share of households that take land on rent from 6,7% to 11,7% (index 2007/2002 = 175);
- increase the average arable land per farm from 301 acres to 336 acres (index 2007/2002 = 112);
- increase the size of the rental land from 220 acres on 299 acres (index 2007/2002 = 136);
- increased the rented area from 377 acres on 513 acres (index 2007/2002 = 136);
- increased use of arable land from 329 acres to 493 acres (index 2007/2002 = 150).

The number of agricultural holdings in Serbia reduced by simultaneous size polarization of house holdings. According to the Living Standards Measurement Survey – LSMS (2007) farms with less than 5 hectares make up 73% of the total number of farms, compared to 80% from 2002 – LSMS (2002). During the monitoring period have been reduced average size of agricultural land of farms on 4,34 ha, i.e. 6% compared to 2002. In Vojvodina, it can be seen transformation of family farms in large commercial farms and businesses. This is especially expressed in low populated areas with high rate of population aging, but much of these areas cover rental land. In the Serbian regions where are significantly represent subsistence farms, and where are the largest share of extensive agriculture, in terms of ownership structure, it can be seen mixed trends. This area according to the average size of the households do not differ significantly than the national average, but for the reason of poor quality, high processing costs and accessibility, about two-thirds of the land does not use.

At the same time, for better quality and land with a better position, rents price reach high values, and here is present a bigger agrarian population.

[105] Republic Geodetic Authority, The Republic of Serbia http://www.rgz.gov.rs/.

4.6. Differentiation of rural regions in Serbia

In accordance with the observed demographic, economic, social, infrastructure and other trends, it can be concluded that the rural areas of Serbia have a high degree of differentiation.

Using cluster analysis[106] to more than forty indicators are defined homogeneous rural regions in which a reasonable extent reflect the specificities of rural areas in Serbia.

1. Region of highly intensive agricultural production and integrated economy is located in the northern part of Serbia that covers the territory of AP Vojvodina and territory of north-western part of Serbia (Mačva). This region is characterized by a plain high quality land and significant water resources: large rivers that flow through this region (Danube, Sava and Tisa). On area of approximately 21 000 km² is located melioration systems that are used for removing excess water. Based on demographic characteristics, economic structure and regional development, noticeable are some differences between the western and eastern parts. The western part of the region has a higher concentration of population, increased investment activity and higher economic growth. Specific lowland landscapes, rivers, lakes, national park "fruskagora" and Deliblatska sandstone is an essential part of the tourist offer of the region, but under special protection is more than 200 natural resources.

2. Region of small urban economy with intensive agriculture is located in the northern parts of Central Serbia, Šumadija, and parts of Mačve and Stig. The area of this region is surrounded by large urban centres, which affects the demographic, economic and social trends in the region. Region of small urban economy with intensive agriculture cover 16,31% of the total territory of Serbia, wherein with respect to natural and geographical conditions of the region somewhat homogeneous. The hilly landscape is dominated by the mountains of the western and the eastern edge of the region. Region of small urban economy with intensive agriculture is more developed with infrastructure compared with other rural regions of Central Serbia. Being located near large urban centres has better infrastructure, as well as easier access to public utility services. The road network is at the national average and is evenly distributed throughout the territory of the region.

3. Mountain region, with an economy based on natural resources, is the most rural region in Serbia and it covers 29% of the territory. A significant part of this area includes parts of Serbia with an altitude of over 500 m, and can

[106] When defining programs RR relating to the project – Support for rural development programming and systems for payments in SCG.

be divided into the hilly and mountainous area. In the valley of the Danube, Morava and South Timoka are present lowland areas, where diversity of landscapes and heterogeneous nature of the resources contributed to an extremely diversified economy and agricultural structure. The main limiting factors for the development of agriculture in this region are under-used land potential shortage of labour, unorganized market and the lack of adequate rural infrastructure.

4. Region of high tourism potential with poor agricultural structure is the smallest rural region in Serbia. It covered 14% of the territory and considering the natural and geographical conditions of the region is relatively homogeneous. This region is one of the most powerful assets for successful positioning of Serbian tourism product, with extraordinary combination of tradition, history and natural beauty. Development priority in the region is building the Ibar highway, but with the simultaneous protection and rational use of natural attractions and areas.

4.7. Conclusion

Considering the analysed characteristics of rural regions in Serbia, the dominant causes of their delayed development are: migration of rural population to urban areas, unfavourable age structure, lack of investment in rural areas, identification of agriculture with development of rural areas with insufficient engagement in non-agricultural activities and others. The above regional areas have specific regional characteristics and different stages of rural development and it is useful that through practical definition of support measures it respects situation, or a regional approach. Consequently, in accordance with the specific needs of individual rural regions it is necessary to support the construction of regional and local institutions to support the development of rural areas by improving co-operation of the Ministry of Agriculture with local governments. Also, it is necessary to increase investment in rural development while simultaneously directing support towards diversification of activities in rural areas of Serbia.

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5. State and development of the human capital in holdings of the fruit sector after Bulgaria's accession to the European Union

5.1. Introduction

Fruit-growing is one of the traditional branches of agriculture in Bulgaria. In the previous period, as a result of socio-economic transformations, the proportion of fruit production in the total agricultural production was drastically reduced.

Despite the stabilisation of the macroeconomic environment after Bulgaria's membership in the EU, the results in fruit growing are still well below its potential. One of the main reasons for this is the low professional and qualification level of the sector employees, along with the inefficient management of the human capital (Bencheva, 2011, 2012).

The lack of good management, as well as the low level of professional knowledge, skills and competences adversely affect the economic performance of the fruit-growing sector. Therefore, it is necessary to analyse the situation and discover opportunities for the effective management and development of the human capital contained therein.

The purpose of this article is to analyse the situation, the key issues and opportunities for the effective management and development of the human capital on farms of the fruit-growing sector different in size, status and ownership structure.

The article is divided into two main sections. The first section examines the status and analyses the main problems of the human capital in the fruit--growing sector. The second demonstrates the key factors for the effective management and development of the human capital in the studied farms.

5.2. Materials and methods

During the study of the status and development of the human capital on farms of the fruit-growing sector different in size, status and ownership structure, four criteria with their respective indicators were used (Table 1). The analysis in this study, based on the specifics of the holdings, includes the following criteria: "Number, structure and experience of employees", "Educational and vocational profile", "Effective use of employees", and "Payment and work incentives". Each

criterion comprises its corresponding indicators, which show the in-depth state of the human capital. Indicators are used to demonstrate the age and sex structure, the length of service, the educational and vocational profile, the productivity, the level of basic and additional payment according to the Labour Code, and the internal regulations of the companies of the fruit-growing sector.

Table 1. Criteria and indicators for the analysis of the status and development of the human capital on the farms of the fruit-growing sector

Criteria	Number, structure and experience of employees	Educational and vocational profile	Effective use of employees	Payment and work incentives
Indicators	*1. Total employed on the farm* a/ of which, management *2. Age structure of the management* a/ from 15 to 35; b/ from 36 to 55; c/ over 56. *3. Gender* a/ men; b/ women. *4. Work experience* a/ to 15 years; b/ from 16 to 35 years; c/ over 36 years.	*1. Education* a/ secondary comprehensive level; b/ specialised secondary education; c/ Bachelor's degree; d/ Master's degree. *2. Experience in the speciality* a/ to 15 years; b/ from 16 to 35 years; c/ over 36 years. *3. Specialisations* a/ in the country; b/ abroad. *4. Training and use of foreign languages* a/ English; b/ French; c/ German; d/ Russian; e/ other languages.	*1. Gross Output from one ha / BGN* *2. Gross Output per employee / BGN* *3. Gross Output one diem / BGN* *4. Gross Output one diem of the management / BGN*	*1. Basic pay and social security of employees in the BGN / month.* *2. Social additional payments BGN / month.* *3. Additional incentives BGN / month*

Source: Own elaboration.

To study the status and development of the human capital, 79 holdings specialised in the cultivation of fruit trees different in size, status and ownership structure are examined. Most of them are located in the South Central region (SCR) where 32% of the plantations in the country are situated in 2007 (at the start of the study) (Agricultural Report, 2008).

In order to present the status and development of the human capital in the fruit-growing farms, they are divided into two groups. The first group features the farms generating profit. The study and analysis of the management on the profitable farms can demonstrate the real possibilities of the optimal use and development of the human capital in order to achieve higher

productivity and competitiveness. In this sense, the profit is seen as a function of proper management decisions, taken by the management of the human capital in the production, process, and product placement.

The second group includes the farms which did not realise profit and reported an economic loss in the studied period. The economic result is measured by the level of profits realised by the farms.

The established criteria and indicators for the study of the status and development of the human capital in the fruit-growing sector are seen as factors of management in the second section. The action and interaction of the main factors of the human capital management affecting the profit of the fruit--growing farms, are examined using the correlation analysis according to the Pearson's method. For analytical purposes, the farms are grouped into three groups according to their organisational and business structure. The first group includes Sole Proprietor (SL). These are mainly small farms where the bulk of the production is for the domestic market. The second and third group include capital holdings. These feature Single Member Limited Liability (Ltd.) and Limited Liability Companies (LLC). In these farms, the main factors to achieve good economic results are vocational education, training and production experience.

The study covers the period between 2007 and 2013. The data and information are collected through direct contacts, specifically developed for the purpose of the analysis reports, charts, company documentation, etc. The final data analysis represents the averages of the surveyed period. For processing and data analysis we used the statistical package SPSS 13.0.

5.3. Results and discussion

Condition and main problems of the human capital on the farms of the fruit-growing sector

The human capital is defined as a set of knowledge and skills that lead to increased productivity and production efficiency. The quality of the human capital on the farms, and its effective use largely determine their economic development (Tepavicharova, 2010; Bencheva, Tepavicharova, 2011).

For the proper functioning of each holding, it should be effectively managed, which directly affects the final economic results. The latter inform about the cumulative result of the skilful management activities and the effective use of the human capital. In this regard, making a profit is also seen as a general indicator value expressing the degree of achieved production and economic

efficiency. Among the surveyed 79 fruit-growing farms, 79.74% generated a profit for the period of the study, while 20.26% reported an economic loss.

Analysis of the status and development of the human capital under the "Number, structure and experience of employees" criterion

To analyse the status and development of the human capital under the "Number, structure and experience of employees" criterion we examined the number of the managerial staff on the holdings, their age structure and sex, and the length of their service (Table 2).

Table 2. Situation of the human capital under the "Number, structure and experience of employees" criterion

Groups of farms / Indicators	Profitable farms		Loss-generating farms		Deviation of profit- to loss-generating farms
	number, $\bar{x}$	%	number, $\bar{x}$	%	%
1. Total employed on the farm	18,69	100	11	100	58,86
2. Of which, management	3,96	21,2	2,4	21,8	60,61
3. Age from 15 to 35	1,04	26,2	0,2	8,3	19,23
4. Age from 36 to 55	1,50	37,9	1,4	58,4	93,33
5. Aged above 56	1,42	35,9	0,8	33,3	56,34
6. Men	2,46	62,1	1,6	66,7	65,04
7. Women	1,50	37,9	0,8	33,3	53,33
8. Work experience to 15 years	1,11	28,2	0,6	25,0	54,05
9. Work experience 16-35 years	1,50	37,9	1,0	41,7	66,67
10. Work experience above 36 years	1,35	33,9	0,8	33,3	59,26

Source: Data from own research.

The analysis of the farms generating profit during the researched period shows that the management staff members amount to 21.2% of the total employed; and on the farms which declared loss, their share is 21.8%. This indicator shows no significant differences between the two groups of farms. However, this is an indicator of the differences in the economic situation of the fruit-growing farms which are more due to differences in the quality characteristics of the managers and their skills, rather than to their number.

In terms of the age structure of the managerial staff on the holdings surveyed, the survey data show that a primary and a particularly acute problem is the aging of the managers. On the farms generating profit, the share of young executives aged from 15 to 35 is 26.2%, and managers aged over 56 is 35.9%. The data on farms generating loss, in the period under review, shows an even more negative trend. The share of the managers aged 35 is only 8.3%, while

those aged over 56 is 33.3%. The lack of balance in terms of age groups, especially in industries with a strong seasonal character and periods of intense labour, such as fruit-growing, has a negative impact on the development of the human capital on the farms. The lack of young people in the management staff, who will adopt and apply innovation, leads to inefficient production and poor economic performance.

With regard to the gender structure of the management on the studied farms, there is a certain prevail of men over women. This applies to both farms generating profit during the study period, and those generating loss. Therefore, the development of the human capital on the farms cannot be linked to the gender of the managers there.

The length of service is an indication of the level of experience in the performance of work duties and responsibilities. It is a source of information for the level of knowledge and skills used by managers in their practice. In terms of this indicator, the studied farms at a profit show ratios similar to the ratios by age groups.

On the farms generating loss in the studied period, the share of the managers with experience of over 36 years (33.3%) is relatively close to the proportion of those with experience from 16 to 35 years (41.7%). The proportion of the managerial staff with experience of up to 15 years is 25.0%. It is important to note that the length of service plays a key role in the development of the human capital only when it is connected to the quality of application of the acquired knowledge and skills into practice. In this respect, the quantitative accumulation of years of professional activity should be combined with the development and improvement of professional knowledge and experience. Only then, the length of service of the managers can be a guarantee for the development of the human capital and the increase in production and economic efficiency on the fruit-growing farms.

Analysis of the status and development of the human capital under the "Educational and vocational profile" criterion

To determine the status and development of the human capital on the farms of the fruit-growing sector under the "Educational and vocational profile" criterion we analysed the acquired education, professional experience and the opportunities for further training.

The survey data for the 2007-2013 period is presented in Table 3. The managers with higher education, on farms which achieved positive economic results, are almost half – 48.6%. Of these, 30.1% have a Master's degree, and

18.50% – Bachelor's degree. Those with a secondary education account for 51.4%, of which 26.2% have specialised secondary education. The irregular payment periods, the unfavourable working conditions, the strong dependence of the production on the natural and climate conditions in the fruit-growing sector, make this an unattractive sector for the managerial personnel having a higher level of education.

Table 3. Situation of the human capital under the "Educational and vocational profile" criterion

Groups of farms / Indicators	Profitable farms		Loss-generating farms		Deviation of profit- to loss-generating farms
	number , $\bar{x}$	%	number, $\bar{x}$	%	%
1. Master's degree	1,19	30,1	0,40	16,7	33,6
2. Bachelor's degree	0,73	18,5	0,20	8,30	27,4
3. Specialised secondary education	1,04	26,2	1,00	41,7	96,2
4. Secondary comprehensive level	1,00	25,2	0,80	33,3	80,0
5. Experience in the speciality to 15 years	1,65	41,8	1,20	50,0	72,7
6. Experience in the speciality 16-35 years	1,42	35,9	1,00	41,7	70,4
7. Work experience above 36 years	0,88	22,3	0,00	8,30	22,7
8. Specialisations	0,38	9,70	0,00	0,00	0,00
a/ in the country	0,23	60,0	0,00	0,00	0,00
b/ abroad	0,15	40,0	0,00	0,00	0,00
9. Training and use of foreign languages	2,58	65,1	0,60	25,0	23,26
a/ English	0,96	37,3	0,40	66,7	41,7
b/ French	0,23	9,00	0,00	0,00	0,00
c/ German	0,12	4,50	0,00	0,00	0,00
d/ Russian	0,31	11,9	0,20	33,3	64,5
e/ other languages	0,96	37,3	0,00	0,00	0,00

Source: Data from own research.

The results of the farms which declared a loss during the period are interesting. According thereto, the managers with a higher education total only 25.0%. Meanwhile, those with a secondary education amount to 75.0%. Of these, the majority have specialised secondary education (41.7%), but the share of the managers with no qualifications (33.3%) is also very high. This indicates that the level of education of the managerial staff on holdings, which declared a loss, is significantly lower than that of the companies with good economic results. **Therefore, the higher education and vocational training are particularly important for the development and the effective management of the human capital on the farms of the fruit-growing sector.**

The analysis of the criterion "Educational and vocational profile" considers the indicator "work experience". The longer experience suggests a greater quantity and quality of knowledge acquired and opportunities used for its implementation. In terms of this indicator, managers with experience of up to

15 years (41.8%) have the highest proportion in the studied farms generating profit. The close shares of the other two groups – those with a qualifying experience from 16 to 35 years (35.9%), and a professional experience of more than 36 years (22.3%) show that there is a potential for continuity in the transfer of knowledge and skills into practice.

The share of the managers with experience of 15 years (50.0%) is the highest on the farms generating loss,. The results for the managerial staff with experience between 16 and 35 years (41.7%) are similar, and those with experience of over 36 years amount to only 8.3%. The negative results for these farms show that the insufficient experience of the managers has a direct influence on the development of the human capital in the fruit-growing sector.

The analysis of the "Specialisation" indicator further clarifies the reasons for the differences in the economic situation of the surveyed farms. In those which declared profit, 9.7% of the managerial staff have specialised at home and/or abroad. The majority (60.0%) have specialised at home, but the share of those who have specialised abroad – 40.0%, is quite significant, too. Meanwhile, on the farms generating loss for the period, no managers acquired specialisation. This leads to the conclusion that improving the skills of the managers and expanding their knowledge and experience by training at home and/or abroad, can lead to a strong positive influence on the development of the human capital on the farms of the fruit-growing sector.

The human capital development requires continuous improvement and self-perfecting of the management, and implementation of the best practices and innovative solutions globally. This largely depends on the capabilities of communication and free use of foreign languages. Therefore, the indicator "Training and use of foreign languages" is particularly important in the analysis of the status and development of the human capital in the fruit-growing sector.

The study of the farms which generated a profit shows that more than half of their managers (65.1%) is able to use a foreign language; 37.3% of them are fluent in English. German is spoken by 4.5% of the managerial staff, and French by 9.0%. Russian language is used by 11.9%, and 37.3% of the managers say they use other languages in their daily activities and at work. On the farms generating loss the share of multilingual managers is significantly lower – 25.0%, which is reflected in the status and development of the human capital on them. The use of languages allows for easy access to the international scientific achievements in the field of fruit-growing. This helps to continually update the knowledge of the managers. The application of the latest techniques and technologies in production results in increased value of the human capital on the farms of the fruit-growing sector.

Analysis of the status and development of the human capital under the "Effectiveness of use of employees" criterion

The effective use of the employees as a key factor in the analysis of the status and development of the human capital joins the level and quality of knowledge and skills, and their application to the physical capital in the production process (Bencheva, 2011, 2012). The study of labour productivity in the fruit-growing sector allows us to understand how, and to what level the qualifications of the managerial staff are reflected in the final economic results of the farms.

Table 4 presents the average values from the study of the labour productivity on the surveyed farms for the period between 2007 and 2013. The data shows that the production in BGN per one acre of farm in the companies which realised loss, is three times less (33.62%) than that of the farms generating profit. The ratio of output per a man-day of the management staff in BGN on the farms generating loss compared to the same indicator for farms which generated profit is only 36.65%.

The data presented leads to the conclusion that the low productivity is a result of inefficient management of the human capital and has a negative impact on its development.

Table 4. Situation of the human capital under the "Effectiveness of use of employees" criterion

Groups of farms / Indicators	Profitable farms		Loss-generating farms		Deviation of profit- to loss-generating farms
	number , $\bar{x}$	μ	number, $\bar{x}$	μ	%
Gross Output from ha / BGN	785,89	55,85	264,2	45,42	33,62
Gross Output per employee / BGN	13777,69	2176,0	4470,4	1241,28	32,45
Gross Output one diem / BGN	54,67	8,63	19,96	4,93	36,52
Gross Output one diem of the management / BGN	244,91	35,22	89,76	29,93	36,65

Source: Data from own research.

Analysis of the status and development of the human capital under the "Payment and work incentives" criterion

Salaries and material incentives are a measure of remuneration of the labour and energy invested by the human capital in the production of certain products.

The employees are motivated to more effectively carry out their tasks in the future when the remuneration is adequate to the work invested. The financial incentives largely attract more and better qualified human capital to the farms of the fruit-growing sector.

The analysis of the criterion "Payment and work incentives" indicates that the additional incentives of the managers at the farms generating loss amounts to only half (49.45%) of the same on the farms generating profit (Table 5). This is due to the fact that the additional material incentive is connected to the achieved production results – the better the production results, the higher the additional incentives must be.

The results of the fruit-growing farms indicate that even on the farms generating profit, the remuneration of the managerial personnel is relatively low. It is not tied to the final production and economic performance, which makes it inefficient. The additional incentives are received as social payments to salaries, but are minor and in most cases compensate only for the inflation for the period.

Part of the farms studied apply another type of incentive. Additional funds above the basic pay are paid at the proper achievement of the production plan. This extra incentive is a largely single-member decision of the owner or owners of the farm, making it uncertain in current conditions.

Table 5. Situation of the human capital under the "Payment and work incentives" criterion

Groups of farms / Indicators	Profitable farms		Loss-generating farms		Deviation of profit- to loss-generating farms
	number , $\bar{x}$	μ	number, $\bar{x}$	μ	%
Basic pay and social security of employees in the BGN/month.	727,78	22,03	720,00	57,59	98,93
Social additional payments BGN/month	6,67	1,01	0,00	0,00	0,00
Additional incentives BGN /month	101,11	23,06	50,0	18,87	49,45

Source: Data from own research.

Key factors for the effective management and the development of the human capital on the farms of the fruit-growing sector

To assess the factors that influence the development of the human capital on the farms of the fruit-growing sector and the three organisational and business structures – Sole Proprietor (SL), Sole Member Limited Liability Company (Ltd.), and Limited Liability Company (LLC) – we have applied the technique of the correlation analysis (Table 6). The level of the profit is considered a dependent variable. The analysis of the results shows that there is a difference between the effect and interaction of the factors, and the economic situation of the farms according to organisational and business structure.

Farm size ($R=0.721$ at $\alpha=0.01$) and the total production ($R=0.806$ at $\alpha=0.01$) strongly influence the economic results of the fruit-growing farms. The strongest is the impact of these factors on the capital companies, with

correlation coefficients of R=0.954 and R=0.869, accordingly, statistically proven at α=0.01. These are large farms with over 500 acres of orchards. Due to their financial stability, these farms attract highly qualified management personnel. The effects of best management practices have a positive impact on the development of the human capital. The competences and skills of the young professionals of up to 35 years of age (R=0.823 at α=0.01 and R=0.617 at α=0.01) have the best prospects for the economic vitality and development on these farms. At the same time, in the smaller-scale farms, the specialists of up to 55 (R=0.733 at α=0.01) are the main drivers of development and innovative thinking.

Table 6. Factors influencing the development of human capital in the fruit-growing. Correlation coefficients – evaluation.

Variable	Holdings of the fruit-growing sector			
	Total	SL	Ltd.	LLC
Farm size, ha	0,721**	0,426*	0,823**	0,954**
Total production, kg	0,806**	0,511**	0,916**	0,869**
Number, structure and experience of employees				
Total employed on the farm	0,911**	0,819**	0,958**	0,629**
of which, management	0,863**	0,868**	0,932**	0,806**
Age from 15 to 35	0,678**	0,024	0,823**	0,617**
Age from 36 to 55	0,616**	0,733**	0,369	0,341
Aged above 56	0,239	-0,114	0,211	-0,018
Men	0,455*	0,174	0,493*	0,211
Women	0,499*	0,121	0,511**	0,087
Work experience to 15 years	0,836**	0,084	0,913**	0,661**
Work experience 16-35 years	0,528**	0,927**	0,458*	0,291
Work experience above 36 years	0,160	-0,127	0,114	0,007
Educational and vocational profile				
Master's degree	0,569**	0,299	0,881**	0,839**
Bachelor's degree	0,710**	0,386*	0,911**	0,974**
Experience in the speciality to 15 years	0,881**	0,486*	0,723**	0,869**
Experience in the speciality 16-35 years	0,664**	0,917**	0,515**	0,634**
Work experience above 36 years	-0,203	-0,743**	-0,403*	0,009
Specialisations in the country	0,739**	0,000	0,539**	0,917**
Specialised trainings abroad	0,694**	0,000	0,624**	0,894**
English speaking	0,568**	0,188	0,603**	0,836**
Effective use of employees				
Gross Output from ha / BGN	0,669**	0,239	0,811**	0,643**
Gross Output per employee / BGN	0,399*	0,468*	0,316	0,217
Gross Output one diem / BGN	0,484*	0,228	0,548**	0,386*
Payment and work incentives				
Primary payment and benefits, lev.	0,789**	0,968**	0,661**	0,556**
Additional incentives, lev	0,463*	0,423*	0,593**	0,827**
Observations,%	100	45	22	33

** Correlation is significant at the 0.05 level; **Correlation is significant at the 0.01 level.*
Source: Own calculations.

An important factor taking into account the level of experience in the fruit-growing sector is employment. Analysis of the data shows that the introduction of new technologies and innovative solutions, the development of effective practical solutions for the modernisation and placement of production, are mainly attributed to professionals with experience of around 15 years (R=0.836 at α=0.01). The quality of their managerial decisions is most evident in the Ltd. (R=0.913 at α=0.01). On the smaller farms, professionalism which leads to improved economic performance is shown by the managers with experience of up to 35 years. From the present data we can conclude that the quality of the management decisions is not always directly related to the acquired experience.

Fruit-growing is a sector in which flexible management, innovative thinking and application of new technologies is a must in order to achieve good production and economic results. In most cases, young managers, with not very long-term experience, display these qualities.

Educational and professional qualification training and experience of the experts also have a very strong influence on the development of the human capital on the farms of the fruit-growing sector. Both, a bachelor's and a master's degree have almost equally strong influence. In order to implement the best manufacturing practices and European standards, the specialists who have undergone training programmes at home and abroad have advanced equipment and technology (R=0.739 at α=0.01 and R=0.694 at α=0.01)

Good salaries and additional incentives are key factors to retaining skilled specialists and to develop economically viable fruit-growing farms.

5.4. Conclusions

The presented data and analysis show the strength of the relationship and the influence of factors of human capital management on the economic situation of the farms. A combination of factors rendering the greatest effect on the development of human capital and its effective management can be offered on the basis of this analysis, namely:

- An important factor for the development of the human capital is the optimal number of managerial staff on the holdings specialising in the production of fruit. The periodical updating of a balance for the necessary and available labour force helps to optimise the number of the managerial and executive staff;
- The competences and skills of the young professionals offer better prospects for economic vitality and development of the fruit-growing farms.

The professional experience is a significant factor only when combined with innovative thinking and application of new techniques and technologies in production;

- The higher degree of managers is indispensable for the development and improvement of the human capital on farms specialised in the production of fruit;
- Studying abroad, as well as the free use of foreign languages, are factors that have a strong positive influence on the development of the human capital;
- The satisfactory payment stimulates employment in the fruit-growing farms which, in turn, mobilises physical and mental potential;
- Modelling of factors of management which have a positive influence on the development of the human capital help to build an integrated system for the selection, training and professional development of managers and employees in the fruit-growing sector.

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