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Evolution of the food retail trade in Poland

Abstract. The food retail trade in Poland is undergoing significant structural changes. The changes basically consist in a dynamic increase in the number of large-format stores, and also in the processes of integration and concentration of trade. In the food trade there are also qualitative changes taking place, in the form of implementing innovations and modern methods of managing the stores. These questions are brought up in this article.

Key words: food trade, FMCG (Fast Moving Consumer Goods) market.

Quantitative changes in the food trade

The aim of the article is to describe the food retail trade evolution that has taken place over the last decade. The changes consisting in an increase in the number of large-format stores result from the globalisation of trade. They are highlighted by the process of concentration of trade which consists in taking over a bigger and bigger volume of turnover by supermarkets, hypermarkets and discount shops. In the paper, statistical data as published current by the GUS (Central Statistical Office of Poland) and poll research centres GfK Polonia, Pentor and PMR are made use of.

The dynamics of structural changes that have been occurring in retail trade in Poland since the beginning of political transformation is considerable. During the two decades between 1989 and 2009, the space of retail shops doubled, from 14.4 to 29 million square metres, which depicts an unprecedented development of the trade sector. Fig. 1 presents data on changes in the number of shops with surface exceeding 400 square metres in Poland in the years 1995-2008 and the function presenting the pace of increase of those modern shopping centres.

The premise for crucial structural changes taking place in the food trade in Poland is, first of all, a dynamic growth of the chain of supermarkets. Such shops are large format stores of the surface area of minimum 2500 m², having at least 10 points of sale and applying only the self-service form of sale. It is worth mentioning that some market research companies assumed in 2007 a major change in rating shops among hypermarkets, as the criterion of the surface area was lowered down to 2000 m².

Hypermarkets sell, at comparatively low prices, a very wide and relatively shallow range of FMCG (Fast Moving Consumer Goods), such as foodstuffs, household chemistry, cosmetics, clothing etc. Such shops, because of their one-storey construction, are located as a rule in the suburbs, thus it is necessary to provide a spacious parking lot for car owners, and a free bus transport facility for those who do not own a car.

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$$y = 2112e^{0,0975t}$$
$$R^2 = 0,99$$
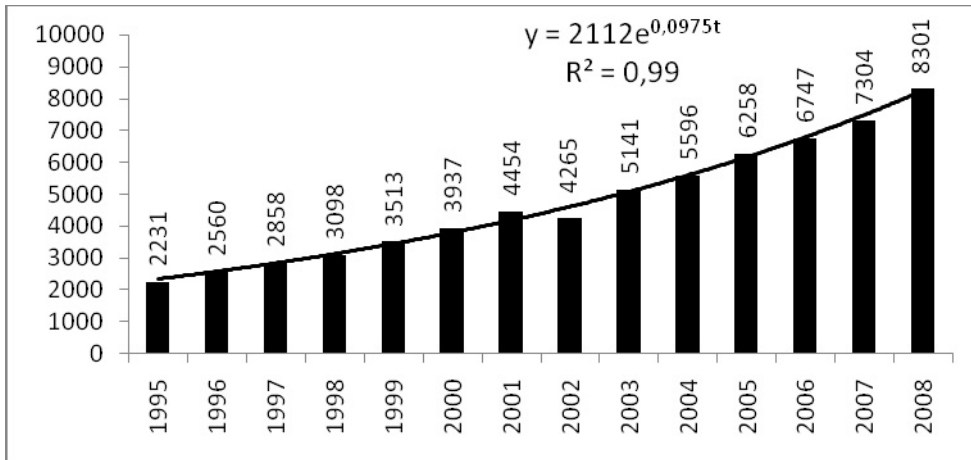
Fig. 1. Number of stores with the surface area exceeding 400 m² in Poland in the years 1995-2008

Source: own study based on data from the GUS (the Central Statistical Office of Poland).

Figure 2 and Table 1 present statistical data on the number of hypermarkets stocking foodstuffs as well as the pace of expansion of the largest chains of such type of stores.
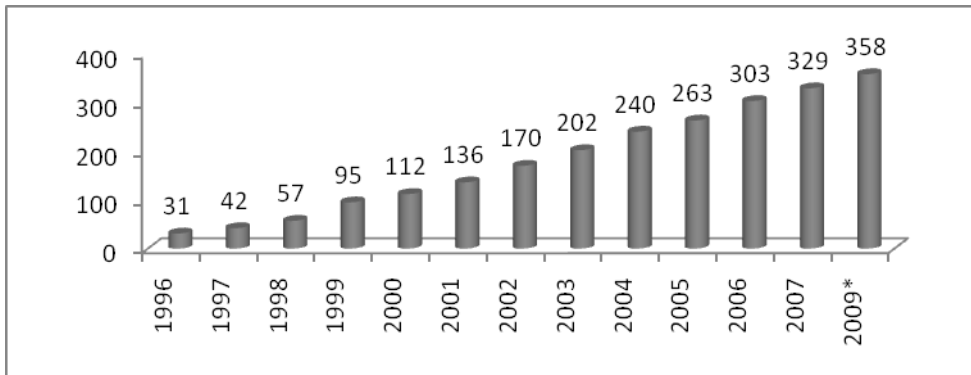
2009* - state on the 30 June 2009, data do not comprise shops selling building materials and household electronics

Fig. 2. The number of hypermarkets in Poland having foodstuffs in their offer

Source: own study based on the data from GfK Polonia.

As a result of processes of concentration of trade there are only seven big chains of hypermarkets in the Polish market (see Table 1) and four of them: Real, Carrefour, Tesco and Auchan are companies with a centralised system of managing the chain, the fifth one (E. Leclerc) is of a franchise character and the sixth one (Alma) is predominantly engaged in developing a format of a delicatessen supermarket. The seventh, and the biggest chain (Kaufland), taking into account its sale area space (4.000 m² per store on average), does meet the criterion of a hypermarket, but as for the assortment in offer and the pricing strategy it is mostly of a discount chain type. It has to be mentioned that other chains, apart

from the seven listed above, do have a few stores meeting the criteria as set for hypermarkets, but generally they are chains of supermarkets (e.g. Piotr i Paweł, Bomi).

Table 1. Leading FMCG hypermarket chains in Poland in years 2000-2008, number of shops

Name of the chain	First facility in year	Year								
		2000	2001	2002	2003	2004	2005	2006	2007	2008
Kaufland	2001	-	2	11	23	43	67	83	93	101
Tesco	1998	10	14	17	35	39	49	51	52	84
Carrefour	1997	7	8	13	13	15	31	34	62	78
Real	1997	24	25	25	27	27	28	30	50	50
Auchan	1996	8	12	15	17	18	19	21	22	22
E. Leclerc	1996	7	9	9	11	11	16	20	13	13
Alma	1995	2	2	2	2	3	5	6	9	10
Géant*	1996	12	15	15	17	17	18	19	-	-
Hypernova*	1999	9	16	20	27	25	13	14	-	-
MiniMal*	1996	22	24	27	27	28	28	22	-	-

* chains of Géant, Hypernova and MiniMal were taken over by new investors

Source: own study based on data from Detal Dzisiaj Network.

The strategy of hypermarkets is based on offering goods at attractive prices to their customers. It is estimated that an average family of four can save over 1 thousand zlotys thanks to purchases at supermarkets instead of traditional shops. It is all the more important for households as lots of consumers declare that price is a decisive factor for them when making a decision on the purchase [Path… 2009]. The price competitiveness of hypermarkets results from the economy of scale in trade activity and from their superior position over their suppliers. The stores can reduce logistic costs thanks to computerised methods of stock taking. The pricing that is advantageous for customers is a result of the very limited range of supplementary services.

Market analysts also emphasize the fact that over the last years the traditional large-format stores have been losing in their rivalry for customers, both to discount chains and to chains of delicatessen stores. The Polish customers' fascination with huge space of shopping facilities and the assortment in offer that was prevailing some 10-15 years ago, now seems to be a thing of the past. The concept of that large-format trading facility, that was developed 50 years ago in France (as the first hypermarket of Carrefour sprang up in the outskirts of Paris in 1963), does not match the style of shopping, consumption and the lifestyle of inhabitants of contemporary agglomerations.

Contemporary customers look not only for good value goods, but also want to save time spent on shopping. Problems with communication, traffic congestions, short supply of parking space, checkout queues, all those factors make a large number of customers choose other forms of sale, namely e-shopping and shopping in smaller, yet more advantageously located, close to their homes, convenience stores. The new challenges in the market rivalry mean that a modern hypermarket does not necessarily have to be more and more big and sophisticated in terms of technology. On the contrary, it should be consumer-friendly, providing desirable atmosphere for not so much doing shopping as for a leisure activity.

The classical concept of a hypermarket is undergoing some evolution in Poland. The differences between compact hypermarkets, supermarkets and discount stores are fading away, the example of that can be the afore-mentioned chain of Kaufland. The concept of mini-hypermarket is being implemented especially by Tesco and Carrefour. It is so, as in the situation of the market being saturated with hypermarkets of typical format, in a smaller town it is easier to locate a smaller shop with the surface area of about 2,000 m² with the prospect of making profit. The format of the mini-hypermarket makes it viable to locate it in a town of 30-40 thousand inhabitants, which in real terms means a growing competition for local merchants. As for selection of goods in offer, for example bread, meat and pork-butcher's products, the store management should take into account customers' preferences and guarantee supplies from local butchers and bakeries. Moreover, such stores should make it possible for customers to use a wide range of supplementary services like the payment of household bills at the counter, topping up the mobile phone accounts or printing photos. It is very advantageous to provide in the store, or in the vicinity, such facilities as catering establishments, a flower shop, a cash dispenser, a laundry, a car wash an the like.

The next group of large-format stores are supermarkets. According to the GUS those are shops of the sales surface area from 400 m² to 2499 m², pursuing sale mainly in the self-service system, and having in offer a wide range of foodstuffs and non-food FMCG [Łukasik 2008]. Table 2 presents data on the most important chains developing that kind of store format.

Table 2. Supermarket chains in Poland

Name of the chain	Number of supermarkets	Average surface area of a store, m^2	Sales in 2008, million PLN
Aldi	24	800	186
Alma	14	1 800	869
Bomi	33	1 800	904
Carrefour Express, Globi	202	500-2 000	7 800*
Delikatesy Centrum	434	200	6 122
Eko	219	400	1 722
Intermarché	140	1 000	2 350
MarcPol	52	700	-
Mini Europa	8	800	950
Piotr i Paweł	62	1 100	1 125
Polomarket	276	550	2 200
Rast	35	1 000	904
Spar	57	235	242
Stokrotka	161	650	11 620*
Tesco	325	500-3 000	9 100

*) approximate figures

Source: own study based on the data from Detal Dzisiaj Network.

Over the last years a significant growth in the number of stores in supermarket chains has been registered, a factor of extending the area of operation of the chains. Moreover, an expansion of a new format of stores has been noted, namely delicatessen stores. All the deli

chains (Piotr i Paweł, Bomi, Alma, Milea, Delima, Delica and Mini Europa) have noted considerable growth in the number of facilities, totally on the national level from 90 to 176 facilities. Moreover, some of them opened their stores in the towns and regions that they had not been present until then.

The next format of retail outlets that have foodstuffs in their offer is discount stores. The competition in attracting customers is becoming more and more fierce. The increasing competition was manifested by entering of the German chain Aldi into the Polish market, as well as by acquisition of the chain Plus Discount by the Biedronka chain. Over the period of six years (2003-2008) the discount chains noted a substantial increase in the number of stores: Biedronka from 630 to 1300, Lidl from 56 to 300 and Netto from 67 to 146. The statistical data illustrate a dynamic expansion of discount trade in the FMCG market. It can be expected however that in the future, with the society getting better-off, the significance of discount stores as a foodstuff distribution channel will deteriorate.

The popularity of large-format stores is confirmed by the research of preferences and purchasing patterns of consumers. The list of the most often attended stores is topped by Biedronka, Real, Tesco and Carrefour. The detailed data are presented in Figure 3.
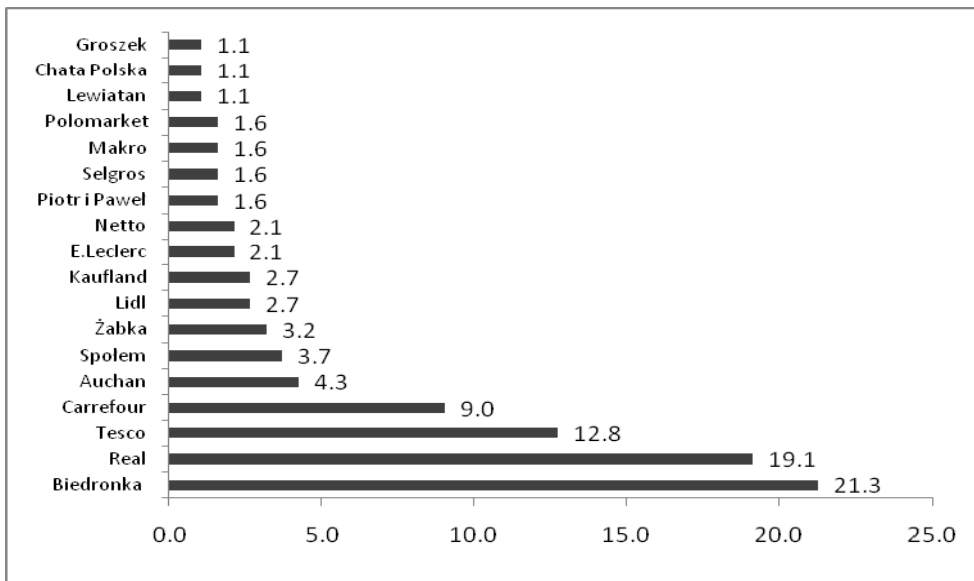
*) the retail chains that received below 1% of responses were passed over

Fig. 3. Ranking of grocery stores as the most attended by Polish consumers, %*

Source: own study on the basis of a study [Handel detaliczny… 2010].

Apart from the afore-mentioned large-format stores it is also traditional small community and rural shops which play important role in providing consumers with groceries. They are both general groceries and specialised outlets, offering goods in specific groups, such as butcher's or greengrocer's goods. Over the last years the number of those outlets has been diminishing rapidly. The exception are off-licence outlets and baker's and confectioner's shops, which is presented in Table 3.

Table 3. Number of general grocery stores and specialist shops in Poland in the years 2000-2008

Year	Stores with food products					
	general groceries	butcher's	baker's and confectioner's shops	greengrocer's	off-licence	fishmonger's
2000	142 257	14 045	3 681	6 678	2 350	1 506
2001	145 934	14 714	4 101	5 251	2 335	1 572
2002	145 238	15 041	4 374	5 308	2 294	1 570
2003	115 658	12 685	4 729	5 279	2 136	1 184
2004	112 301	12 456	5 446	4 778	2 268	1 053
2005	116 094	13 072	5 220	5 222	2 454	1 106
2006	120 455	12 002	5 430	4 451	2 510	942
2007	105 509	12 448	6 033	4 778	2 768	974
2008	98 460	11 966	6 508	4 407	2 723	932
2008/2000, %	69,2	85,2	176,8	66,0	115,9	61,9

Source: own study on the basis of data from the Central Statistical Office (GUS) of Poland as well as work by Hościłowicz, Janowska & Meredyk [2008, p. 182].

As for providing consumers with foodstuffs, the role of sales via the Internet is still diminutive. Food is the assortment that is very rarely ordered via the Internet. Purchases of bread or pork-butcher's products by placing orders via electronic means with the seller or directly with the producer for an immediate home delivery is still unpopular. Therefore it is very unlikely that in the nearest future the food e-shopping will pose a threat to traditional retailers on a massive scale. Food is purchased via online shopping by approximately only 5 % of Internet users and books, on the other hand, by as many as 60 %. The food e-shops can be divided into two kinds in terms of width and depth of the offer available:

- horizontal shops, i.e. so-called Internet hypermarkets, ordering wide, yet shallow selection of goods for wide group of consumers,
- vertical shops, offering niche assortment, intended for connoisseurs: wine shops, organic food, products for vegetarians [Kosicka-Gębska, Tul-Krzyszczuk & Gębski 2009].

It turns out that in case of foodstuffs there are very few supermarkets to have broadened their to-date services in Poland with implementation of sales over the Internet. For example, online sale of a wide range of foodstuffs is pursued by the Piotr i Paweł chain (www.piotripawel.pl/e-zakupy/). The online orders can also be placed with Tesco (www.tesco.pl), the chains of Real (www.real.pl) and E. Leclerc (www.hipernet24.pl), however it refers to a limited range of goods as yet. The delicatessen stores of Alma have engaged into sales of foodstuffs via the Internet (www.alma24.pl) as well as the Bomi in Warsaw (www.supersam24.pl). Modern online supermarkets (www.delikatesypanorama.pl, www.frisco.pl, www.delikatesy.net.pl, www.dorinek.pl) with a wide range of coffee and tea brands, seasonings, seafood, wines and liquors are operating in Warsaw and other cities in Poland. E-commerce is generating, via e-shops and auction services, approximately 1% of the volume of total turnover of retail trade. In Poland there were in total 4.1 thousand internet shops in 2008, and their turnover amounted to 12 billion PLN, compared with 8

billion in 2007, 5 billion in 2006 and 3 billion in 2005 [Słomińska 2008].

Qualitative changes in trade in food products

Apart from quantitative changes in trade, manifesting themselves through an expansion of hypermarkets, supermarkets and discount shops, as well as through a decrease in importance of petty trading in the sector of retail trade, there are also significant qualitative changes going on. The changes consist in implementation of innovations and making use of modern concepts of managing commercial chains.

In the broad sense the term 'innovations' consists in introduction of a new or significantly improved product or service, process, new method of managing an organisation, new marketing method, applied at a place of employment and in relations with outer entities of micro-environment, and in particular with customers and partners in the market. In the circumstances of markets undergoing globalisation, attaining an advantageous competitive position by a trade company is linked to developing innovative technologies and introducing new products into the offer. Innovative character of the changes in that sphere means improvements in sales technology by introducing new solutions, such as modern sales appliances, IT and logistics systems. The question that is worth mentioning is optimisation of methods of organisation and managing retail and wholesale trade companies.

Modern technologies contribute to the mechanisation and automation of labour in the trade sector, and bring labour intensity and capital-intensive nature of economic activity to lower levels. The basic areas of application of technological innovation is the computer-aided managing and control of sales and stock. Such technological achievements as computers, barcode readers (scanners), cash registers are decisive for the trade efficiency. Apart from inventions based on electronics, the application of new technologies comprises new furnishings, new storage appliances and other auxiliary means making the storage easier and improving durability of goods. Moreover, the important sphere of retailers' business success is a quest for new original architectural solutions implemented in construction and adaptations of shopping centres. The experience of the past proves that market leaders managed to become successful by concentrating on creativity and innovativeness, which in turn was acclaimed by more and more demanding customers.

Technology is also a tool of streamlining management with a view of prompt decision making, although at some stage the technology itself becomes an advantage for managers. When analysing that group of conditions of development of trade companies it should be emphasized that there are almost unlimited possibilities of technological changes and the fact that innovative equipment and sales techniques (e.g. via the Internet or vending machines) are entering business at a fast pace, and also are adapted by market competitors. In the future, we can expect a growing involvement of governments in legal regulations of challenges resulting from an unprecedented technological progress, e.g. regulations regarding the sale of genetically modified food, limitations imposed to advertising and sales of some goods, such as medicines.

In the trade business, even though the importance of so-called human factor, i.e. the personnel, in the process of direct service is significant, the development of new technologies serves to bringing down the cost of, for instance, logistics, financial services and to generating improved methods of winning new customers and increasing sales.

Technological changes are implemented in view of gaining advantage over competitors in such areas as ordering systems, transfer of payments, storage, stocktaking, communications with customers.

It is estimated that foreign investors participate in approximately 50% of investment in trade in Poland. Investments by global trade corporations have a very advantageous impact on the growth of real assets in the trade industry. The structure of investing is dominated by purchases of real estate, both existing buildings and building lots, with a prospect of new buildings, construction of shopping centres, hypermarkets, supermarkets, discount stores, stores of the 'cash and carry' type, petrol stations with trade and service backing and logistic centres. The main barriers for investing are a relatively low purchasing power of the population and unstable legal governmental guarantees for foreign investors, e.g. relating to stability of tax laws, rental of real estate etc. Other barriers limiting a further inflow of foreign investment into the trade industry is a short supply of building lots of attractive location, intended for location of stores, as well as the deterioration of pace of economic development. According to the latest edition of the report entitled 'Food products retail trade in Poland in 2009' [Food… 2010], the volume of the food market in Poland, understood as the volume of sales of food products and industrial goods at food stores, in 2009 amounted to 223.5 billion PLN. It means a growth of 0.4% as compared to 2008, which in turn noted a growth of as much as 8.9 % in comparison with 2007. Such a small dynamics of growth is a result of an economic slowdown, which in turn translates to lower expenses on consumption purposes. According to initial estimations, the growth of food market is not likely to exceed 1% in 2010, although in the next years the situation is expected to improve gradually.

The fastest growing segment of food market is the market of organic food. Consumers are becoming more and more interested in purchasing food products of the highest quality, safe for health, with no content of preservatives, and produced according to methods that are in equilibrium with the natural environment.

In the food retail trade innovations refer not only to the implementation of self-service points of sale in hypermarkets, loyalty cards and other loyalty programmes (creation of loyalty), but first and foremost refer to offering products of which the contents, recipes, ways of manufacturing and packaging are at the cutting edge of quality. Here are the examples that should be mentioned:

- taking up a number of activities aimed at protection of the natural environment
- ecological materials used for manufacturing of shopping bags, packaging of e.g. fruit juice
- packaging of e.g. yoghurts that have an option of multiple opening and closing, or sliced cheese that makes it possible to keep it fresh
- packages with so called safety button on the lid which, following the opening of package, becomes convex and informs that the package has been opened and thus the packaging is not original [Podstawy… 2007]
- self-adhesive stickers monitoring storage conditions and sell-by date as well as changing their colour depending on temperature and humidity of the air
- active packaging, containing an active substance that absorbs oxygen, water, carbon dioxide [Trzcińska 2006].

The tool that in the near future will undoubtedly have a great impact on performance of trade, and currently is in the stage of testing, is RFID (Radio Frequency Identification

Technology) which means a technology of recognizing products on the basis of identification of radio wave frequency. Up till now the predominant solution has been the EAN bar codes. The new system provides more comprehensive and accurate information on a given product, thus upgrading the flow of information necessary to co-ordinate orders and improving labour efficiency connected with transportation, storage and promotion in the sales facility. The advantages of using the system consist in, among others, better control over the process of withdrawal of products (e.g. past their selling date) from the market [Szymanowski 2008].

As for other new solutions that are to be implemented in the shopping centres, among things that are worth mentioning, are micro computers assembled in trolleys that will help find individual departments, as well as electronic displays, LCD screens and other devices from the range of digital merchandising (electronic means of advertising and promoting at the retail outlet).

Conclusions

1. The growing importance of modern large-format stores, such as hypermarkets, supermarkets and discount stores is a typical feature of food retail trade in Poland.
2. The share of aforesaid large-format stores in the turnover of FMCG is growing annually by 2-3 percentage points, at the expense of small traditional shops that are no longer able to keep up with the competitors.
3. The share of modern forms of trade intermediary activities, i.e. hypermarkets, supermarkets and discount stores in the total turnover of FMCG amounted to 45% in 2008 as compared to 16% in 1998. It is estimated that in the nearest future their share will exceed 50%, which means that traditional shops will have lost in the rivalry for the title of the leading distribution channel for FMCG.
4. Small grocery shops have a chance of winning the rivalry with supermarkets providing that the owners of the former do not compete on the level of prices, but rather concentrate on the quality of service, freshness of their offer, good location and good personal relationship with their customers.
5. The characteristic feature of food retail trade nowadays are not only quantitative and structural changes, but also qualitative features in the form of implementation of innovations regarding goods in offer and methods of serving the customers.
6. The globalisation of trade, along with the Poland's accession to the European Union, has produced a positive effect on development of retail trade, which is reflected in the volume of inflowing foreign investment and the development of modern technology.

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Corporate Social Responsibility in the agri-food sector: the case of GMOs

Abstract. Genetically modified organisms (GMOs) are handled differently in different countries. Whereas global acreage of GMOs jumped to 134 million hectares in 2009 [Cultivation... 2010], in many European countries opposition to GMOs is still strong, and their acreage is very small. This situation poses a difficult situation for many companies and their corporate social responsibility [CSR] strategies. Against this background, we conducted an online survey of 170 agribusiness firms in order to shed some light on how companies handle the conflict between, on the one hand, the growing use of GMOs worldwide and, on the other, the rejection of GMOs by European consumers. The empirical results show that many agribusiness firms perceive the use of GMOs as a highly relevant management issue that shapes their CSR strategies. All in all, agribusiness firms apply a wide spectrum of CSR activities; furthermore, CSR is considered a top management responsibility. GMOs are of above-average relevance in firms that have been criticized for their attitudes towards and use of GMOs. The empirical results have interesting implications for the management of CSR and legitimacy in the agribusiness sector.

Key words: corporate social responsibility, GMOs, agri-food sector

Introduction

GMOs pose major challenges for many European agribusiness firms. On the one hand, acreage of GMOs has surged in world agriculture in recent years. Therefore, it has become more and more difficult to avoid the use of GMOs, for instance in feeding stuffs, or the blending of GMO-free products and GMOs. On the other hand, many (Western) European consumers still adamantly refuse to consume GMOs and consider their use morally condemnable [Koppelmann & Willers 2008].

Against this background, sourcing of GMO-free inputs is becoming more and more difficult in agri-food chains. Furthermore, firms' CSR strategies have to take into account the GMO challenge since CSR is a concept that addresses the socially desirable behaviour of companies. It incorporates the economic, legal, ethical and philanthropic responsibility of firms [Carroll 1998]. Implementing a CSR strategy is considered a way to ensure a legitimacy of firm's actions and an acceptance of firm activities by the wider society. In that sense, CSR is believed to guarantee a firm's legitimacy ('license to operate') [Hiss 2006]. Social legitimacy as a result of CSR strategies is expected to have a high relevance for firm's financial performance [Orlitzky et al. 2003; Mackey et al. 2007].

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This paper will illustrate how agribusiness firms perceive the tensions between the growing difficulty of avoiding the use of GMOs and their lack of acceptance in Europe and how these tensions influence their CSR strategies. It will present the results of a comprehensive literature review and an online survey of German agribusiness companies. Respondents were asked to assess the external pressure they face and the CSR strategies and instruments implemented so far. All in all, 170 firms of very different size and from various industries participated in the survey. This reflects the high relevance of social conflicts and CSR issues. The empirical results provide in-depth insights into how agribusiness companies perceive conflicts between technological progress and social expectations and what their reactions to these conflicts are. The results have interesting managerial implications for agribusiness firms.

The remainder of the paper consists of five parts. In section 2, we highlight the relevance of GMOs for world and European agriculture and the uptake of this phenomenon in the literature. Then we examine the relevance of legitimacy for agribusiness firms and outline the CSR concept (sections 3 and 4). In section 5, we present some empirical results. The paper ends with a discussion of our results and some concluding remarks (section 6).

GMOs in agriculture and food production

GMOs have continuously gained market shares in world agriculture. In 2009, GMOs were grown on 134 million hectares [Cultivation... 2010], which represents about 6.7% of the world's total acreage of 1.98 billion hectares. The most important growers of GMOs are the United States (64.0 million hectare), Brazil (21.4 million hectare) and Argentina (21.3 million hectare). In 2009, 14.0 million farmers in 25 countries were growing GMOs. The most important genetically modified crops are soybeans, maize, cotton and rapeseed [Global… 2009]. Since GMOs are mainly used in high-intensity, high-yield production systems, their share in agricultural outputs is larger than their share in the agricultural land.

Except for a few regions, GMOs are of much lower relevance in Europe. In recent years some regions have even witnessed a decline in GMO acreage. Large-scale growing of GMOs can more or less only be observed in Spain, while in many other European countries GMOs are only grown in the context of scientific research projects. Germany is a typical example, with mainly genetically modified maize grown on 150 hectares in 2010 [Oeffentliches… 2010]. Compared to earlier years, this is an extreme decrease: in 2008, for example, GMO maize was being grown on 3,173 hectares. Nonetheless, the actual acreage is often even lower than the acreage registered by competent authorities due to protests from NGOs and a systematic destruction of plants by anti-GMO activists.

Recent changes in the regulatory frameworks of some European states, including Hungary, France and Switzerland, have contributed to a further decline in the relevance of GMOs in Europe. Furthermore, it can be observed that many European food processors have a clear-cut non-GMO strategy [Gawron & Theuvsen 2008]. Unlike feeding stuff companies, food processors are afraid of consumer boycotts and a negative press coverage and, therefore, refrain from using GMOs as raw materials.

In the last two decades, there has been a considerable research on GMOs. Various studies have analyzed the cost effects of GMOs on agriculture and food industry, highlighting cost savings, due to factors such as lower pesticide costs, and cost increases,

due to additional laboratory tests, separation of batches and so forth [Gawron & Theuvsen 2008; Brookes et al. 2005; Wilson & Dahl 2005]. A second strand of research addresses the acceptance of GMOs by farmers and consumers. Whereas authors find positive attitudes towards GMOs mainly in North America [Napier et al. 2004; Chern & Rickertsen 2002], European studies reveal wide-spread scepticism against GMOs in food products [Hampel 2004]. In Germany, for instance, only 16% of the population are in favour of GMOs. Another 20% cognitively accept GMOs but, nonetheless, have negative feelings towards GMOs. While 18% are not at all interested in the topic, 46% oppose the use of GMOs for various reasons [Willers 2007]. Earlier studies have revealed that many consumers consider the use of GMOs in food production morally condemnable [Koppelmann & Willers 2008]. Farmers' attitudes have also been researched. Babcock et al. [2006], for instance, analyzed the effects of expected reductions of input factors, such as use of pesticides and yield increases, on farmers' attitudes.

GMOs and legitimacy of firm activities

The strong rejection of GMOs by a majority of European consumers indicates that genetic engineering as well as the industry and firms developing and using GMO technology suffer from a lack of social legitimacy. According to Parsons [1956], it is a central challenge for any organization to socially legitimize its objectives, structures, products and processes. The legitimacy of actions and institutions is perceived subjectively; it is a result of social construction processes [Berger & Luckmann 1966]. Actions are considered legitimate if they are perceived as correct and appropriate within a social system of norms, values, convictions and definitions [Suchman 1995]. In other words, organizations enjoy legitimacy if they pursue socially acceptable goals in a socially acceptable way [Ashforth & Gibbs 1990] and meet social expectations [Scott & Meyer 1994].

Legitimacy is essential for the survival of organizations since it is a precondition for a continuous flow of resources and a continued support of organizations through core stakeholders [Parsons 1960; Pfeffer & Salancik 1978]. Individuals and organizations that have lost legitimacy face more difficult social exchange processes since their partners have lost trust in their compliance with social rules [Palazzo & Scherer 2006]. Therefore, legitimacy is a form of qualified acceptance that goes far beyond tolerance of organizational behaviour that may result in socially undesirable outcomes. More specifically, it means that institutions receive their 'social license to operate' only if they do not behave in an illegitimate way [Suchanek 2004].

Various forms of organizational legitimacy can be distinguished. Suchman [1995] suggests a distinction between pragmatic, cognitive and moral legitimacy.

Pragmatic legitimacy is ascribed to organizations by utility-maximizing stakeholders or the wider public if these groups benefit from organization's actions through, for instance, payments of loans and dividends, cost savings or contributions to social welfare. Stakeholders and instrumental public relations strategies that demonstrate the usefulness of an organization to external groups are well-proven ways to improve an organization's pragmatic legitimacy [Palazzo & Scherer 2006].

Cognitive legitimacy results from society's belief that an organization and its output are useful and inevitable. Unlike pragmatic legitimacy, cognitive legitimacy is often unconscious. Therefore, it is difficult for organizations to directly influence the perceptions that are relevant for the emergence of cognitive legitimacy [Oliver 1991]. Nonetheless, it can be improved by an organization's compliance with role models and behaviour expected by society [Scott 1995].

Moral legitimacy refers to moral judgments with regard to the outputs and processes of organizations. Since the moral legitimacy is a result of public discourses, organizations should participate in those discourses that are relevant for their moral legitimacy [Suchman 1995].

Against this background, the strong rejection of GMOs by European consumers indicates that they neither experience any immediate benefits from that technology nor perceive it as useful and inevitable. Furthermore, the moral objections that are often raised against GMOs indicate a deeply rooted lack of moral legitimacy. Since moral legitimacy does not result from cognitive processes but from unconscious value judgments, it is very difficult for agribusiness firms to regain legitimacy.

Corporate Social Responsibility

From a neoinstitutionalist perspective, CSR is often discussed as a concept for securing the legitimacy of economic activities, i.e. a firm's 'license to operate' [Hiss 2006; Mueller & Seuring 2007]. Despite a large number of publications on CSR [de Bakker et al. 2005] and the implementation of CSR strategies in many companies, there is still a lack of a precise terminology [Dahlsrud 2006]. Carroll [1999], for instance, identified 25 different definitions of CSR in the literature. This conceptual murkiness is also due to close relationships between CSR and similar concepts, like corporate citizenship, accountability, good corporate governance [Hiss 2006], sustainability and stakeholder management. Many of these concepts have been developed during public and scientific discourses on environmental protection and sustainable development. They can be summarized under a broadly defined CSR concept (Figure 1).

According to the European Commission [2001], CSR can be defined as a concept according to which companies voluntarily integrate social and environmental considerations into their activities as well as their relationships with stakeholders. A similar definition was proposed by the World Business Council on Sustainable Development, according to which CSR is 'the commitment of business to contribute to sustainable economic development, working with employees, their families, the local community and society at large to improve their quality of life. Thus environmental concerns are part of a company's CSR' [The Business… 2002, p. 6]. Concluding, CSR is a concept that integrates social and ecological values into a firm's core activities and includes joint action with stakeholders for the public good.

Based on a comprehensive literature review, Carroll [1998] proposed a model that defines CSR as a framework concept that includes company's economic, legal, ethical and philanthropic responsibilities. Economic responsibility refers to the production of socially desirable goods and services at fair prices and to the firm's contribution to employment and social welfare. This has to take place in compliance with the generally accepted regulatory

framework (legal responsibility). The ethical responsibility demands a compliance with social rules and values even if they are not legally codified. Finally, the philanthropic responsibility refers to the good corporate citizenship of firms in the sense of 'corporate giving' or 'giving back to society' [Dubielzig & Schaltegger 2005]. Managing companies in line with these principles allows firms to meet the triple bottom line of economic, social and environmental sustainability [Loew et al. 2004; Elkington 1994; Heyder & Theuvsen 2008]. It is often assumed that CSR contributes to a better firm reputation, a workers' loyalty and a higher legitimacy of firm activities [Moir 2001]. Therefore, CSR may increase costs in the short run but can contribute to improved firm profitability in the long run.
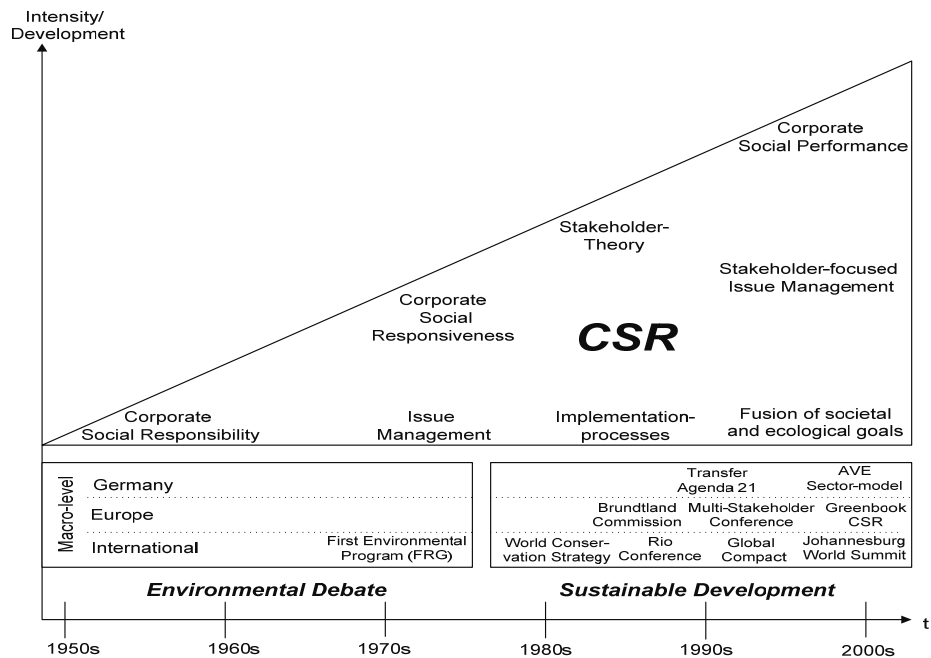
Fig. 1. Historical development of CSR

Source: adapted from Muenstermann [2007].

Empirical findings on CSR strategies in the agribusiness sector

Methodology

Between July and September 2008, an online survey of CSR strategies in the agribusiness sector was conducted. With the help of various industry associations, 2,500 German agribusiness firms were surveyed extensively. The survey focused on the external pressure the respondents faced, the firms' interpretation of social responsibility, and the CSR strategies and instruments implemented so far. For measuring attitudes and perceptions, we mainly used five-point Likert scale. Univariate and bivariate analyses with SPSS software provided in-depth insights into how agribusiness firms perceive the tensions

between technological progress and social expectations and how this influences their behaviour.

Corporate Social Responsibility

| Economic
"be profitable" | Legal
"obey the law" | Ethical
"be ethical" | Philanthropic
"be a good corporate citzen" |

Three dimensions of sustainability: economic, ecological, social (Triple Bottom Line)
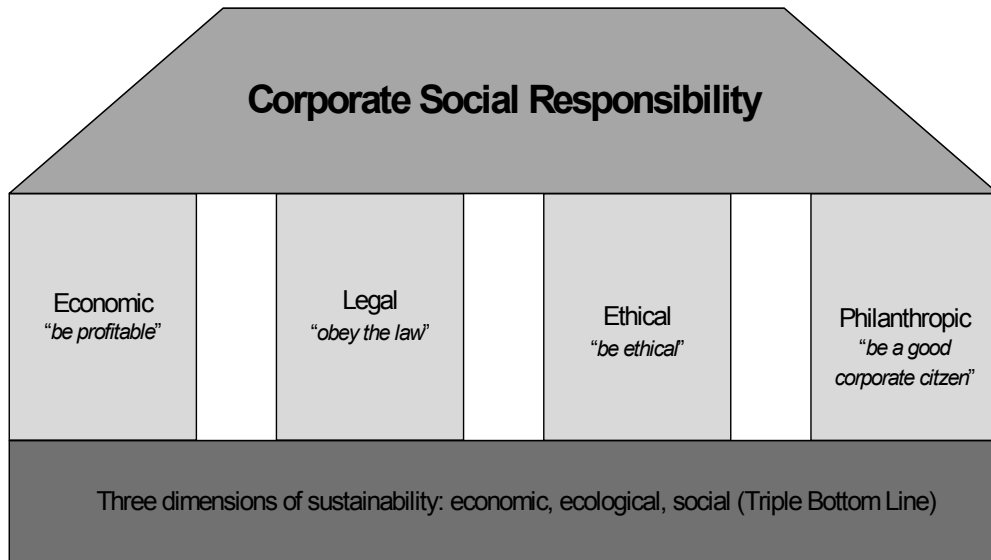
Fig. 2. The 'CSR house'

Source: adapted from Carroll [1998].

All in all, the sample includes 170 agribusiness firms from various industry sub-sectors and of very different size. The response rate was 6.8%. Although some authors report on higher response rates [Dennis 2003; Al-Subaihi 2008], we consider the participation in our study satisfactory when generally declining response rates in surveys [Schiefer & Reynolds 2009] and the tight time budgets of the top managers contacted are taken into account. Of the respondents, 56% are board members. The industries represented in the sample include slaughtering and meat processing (12.3%), bakery products (10.7%), sweets (7.4%), dairy companies (6.6%), breweries (6.6%), mills (5.7%), agrochemical companies (4.9%), agricultural engineering (4.9%), feeding stuffs (4.1%), seed companies (4.1%), fruit and vegetable processing (4%) and others (28.3%).

The agribusiness sector is characterized by a few large leading companies and a wide spectrum of small and medium-sized enterprises. This industry structure is also reflected in the survey, which includes micro enterprises, small and medium-sized companies and a few very large companies (Figure 3). Of the respondents, 51% have an annual turnover of €5 million up to €250 million. Despite a good representation of the overall industry structure with regard to firm size and industry sub-sectors, the survey lacks representativeness. Nonetheless, since most respondents are affected to a certain degree by social conflicts with regard to the use of GMOs, the survey provides interesting insights into agribusiness firms' reactions to public discussions on GMOs and allows for conclusions regarding the management of legitimacy through CSR strategies.
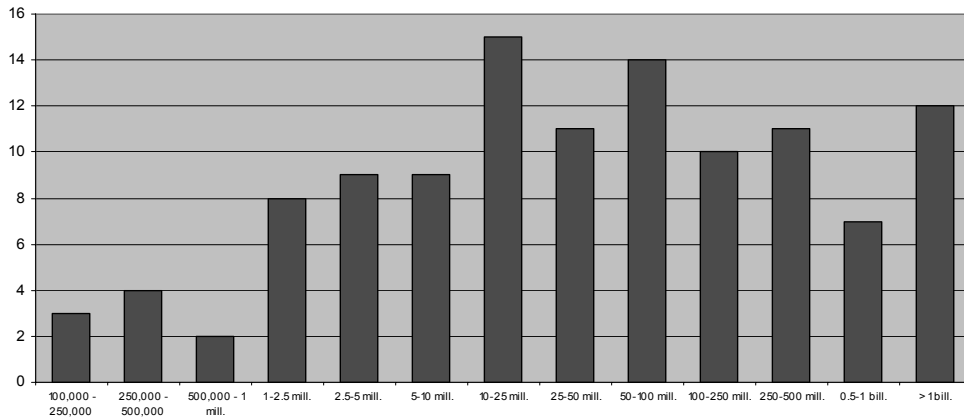
Fig. 3. Annual turnover of companies surveyed, euro

Source: own illustration.

Agribusiness Firms under Public Pressure

Due to the debate on GMOs, but also due to a considerable number of crises and scandals, public pressure on agribusiness firms has increased in recent years. Unlike farmers, who have a comparatively positive, albeit somewhat old-fashioned, image, the agribusiness firms are in the focus of various critical stakeholders, such as nongovernmental organizations (NGOs) as well as the wider public. Due to a widespread dissatisfaction with the industrialization of food production, including the use of GMOs, the agribusiness sector has become a preferred target of societal debates [Jansen & Vellema 2004]. As a consequence, the legitimacy and reputation of the food supply chain have been severely damaged.

The results of our survey show that the respondents, although they perceive a strong public pressure on their companies, do not generally refuse public demands and protests with regard to food production. Instead, a majority of the respondents agree that claims for paying fair prices to farmers ($\mu = 3.72$; $\sigma = 0.997$), providing fairer terms of trade for developing countries ($\mu = 3.62$; $\sigma = 0.883$) and acceptable social standards for employees ($\mu = 3.53$; $\sigma = 0.939$) as well as higher environmental ($\mu = 3.48$; $\sigma = 0.950$) and animal welfare standards are justified. The question whether or not protests against GMOs are justified provokes mixed answers ($\mu = 2.98$; $\sigma = 1.240$); 31.8% of the respondents perceive these protests as justified or even very justified, whereas 36.4% consider them not or not at all justified. Only very limited support can be observed with regard to protests against globalization ($\mu = 2.78$; $\sigma = 0.862$) and claims for lower levels of pesticide residues in food products ($\mu = 2.85$; $\sigma = 0.997$) and higher food product labelling standards ($\mu = 2.83$; $\sigma = 0.974$) (Table 1).

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Table 1. Answers to question. There are often protests and claims with regard to food production. Do you think that the following claims are justified?

Issue	μ	σ	Not at all justified	Not justified	Partly justified	Justified	Strongly justified
Protests against globalization (n=170)	2.78	0.862	8 4.7%	56 32.9%	78 45.9%	22 12.9%	6 3.5%
Acceptable social standards for employees (n=169)	3.53	0.939	5 3.0%	18 10.7%	49 29.0%	77 45.6%	20 11.8%
Higher environmental standards (n=170)	3.48	0.950	3 1.8%	24 14.1%	53 31.2%	68 40.0%	22 12.9%
Higher animal welfare standards (n=170)	3.25	0.984	4 2.4%	34 20.0%	68 40.0%	44 25.9%	20 11.8%
Lower limits for pesticide residues in food products (n=170)	2.85	0.997	6 3.5%	69 40.6%	52 30.6%	31 18.2%	12 7.1%
Protests against GMOs (n=170)	2.98	1.240	22 12.9%	40 23.5%	54 31.8%	28 16.5%	26 15.3%
Fairer terms of trade for developing countries (n=170)	3.62	0.883	0 0%	18 10.6%	56 32.9%	68 40.0%	28 16.5%
Fair prices for agricultural products (n=170)	3.72	0.997	3 1.8%	19 11.2%	39 22.9%	70 41.2%	39 22.9%
Stricter and more informative food product labelling (n=169)	2.83	0.974	11 6.5%	57 33.7%	56 33.1%	39 23.1%	6 3.6%

Notes: μ – mean; σ – standard deviation

Source: own investigation.

The empirical results also show that finding an official position towards the use of GMOs is difficult for many agribusiness firms (Table 2). Only 37% of the respondents say that they do not face a strong public pressure with regard to GMOs due to the official (anti-GMO) position of their company. Correlation analyses show that companies that have very critical attitudes towards GMOs and consider protests against GMOs justified (r = 0.483; p < 0.001) are often engaged in the organic food market. These companies' legitimacy is not challenged in the GMO debate. On the other hand, a similarly large group of respondents (37.1%) perceive a strong or even a very strong public pressure due to their position towards GMOs. The latter is perceived as a single most relevant issue with regard to societal debates (μ = 2.97; σ = 1.241). Next come the food product characteristics that have negative effects on consumers' health (such as fat, sugar and alcohol; μ = 2.79; σ = 1.207), the environmental effects of production methods (μ = 2.65; σ = 1.067) and the potential threats to public health resulting from contaminants in food products (μ = 2.57; σ = 1.236). The standard deviations are on average high since companies from certain agribusiness subsectors, such as slaughtering and meat processing, face strong external pressure, whereas other respondents do not see any threats to their reputation and legitimacy at all, since their products or production methods do not have any negative effects on, for instance, the environment or consumers. Interestingly, very few respondents feel strong

external pressure due to food safety incidents and other scandals that often receive an extensive media coverage.

Table 2. Answers to question. How strongly do you perceive external pressure on your company with regard to the following?

Issue	μ	σ	Very weak	Weak	Neither weak nor strong	Strong	Very strong
Effects on the external environment (emissions, waste water etc.)([n=170)	2.65	1.067	28 16.5%	49 28.8%	50 29.4%	40 23.5%	3 1.8%
Company's position towards GMOs (n=156)	2.97	1.241	23 14.7%	35 22.4%	40 25.6%	40 25.6%	18 11.5%
Animal welfare issues (n=164)	2.13	1.283	78 47.6%	27 16.5%	26 15.9%	26 15.9%	7 4.3%
Health incidents due to contaminants in food products (residues etc.) (n=165)	2.57	1.236	37 22.4%	52 31.5%	34 20.6%	29 17.6%	13 7.9%
Characteristics of our food products (e.g. fat, sugar, alcohol) (n=167)	2.79	1.207	30 18.0%	42 25.1%	38 22.4%	47 28.1%	10 6.0%
Working conditions of employees (e.g. wages) (n=170)	2.15	1.026	52 30.6%	63 37.1%	35 20.6%	17 10.0%	3 1.8%
Internal affairs (corruption, bad corporate governance etc.) (n=168)	1.64	0.828	92 54.8%	49 29.2%	23 13.7%	3 1.8%	1 0.6%
Conflicts with neighbours (e.g. due to construction work) (n=168)	2.00	1.083	71 42.3%	50 29.8%	26 15.5%	18 10.7%	3 1.8%
Lack of fair treatment of customers and suppliers (n=168)	2.02	1.041	65 38.7%	55 32.7%	32 19.0%	12 7.1%	4 2.4%
Protests against production methods of suppliers (n=167)	1.80	0.788	69 41.3%	66 39.5%	29 17.4%	3 1.8%	0 0.0%

Notes: μ – mean; σ – standard deviation

Source: own investigation.

A strong public pressure many companies face due to their position towards GMOs suggests that it would be advisable to analyze in greater detail the relationships between the pressure perceived (Table 2) and other statements that reflect various aspects of external pressure, a company's social responsibility and its relationships with external stakeholders (Table 3). Interestingly, a highly significant relationship can be observed between a company's position towards GMOs and its public image. Companies that support the use of GMOs are more regularly criticized by the wider public, receive a more negative press coverage and more often suffer from decreasing turnover. All in all, this reflects a negative public image of industries that advocate the use of GMOs. These industries include the biotech industry as well as parts of the food industry since public protests are also directed against production methods of suppliers. Companies that are attacked due to their position towards GMOs are also criticized for the potential negative effects of their products on human health and the environment, animal welfare issues, employee working conditions

and product characteristics in general. The latter aspects can, at least to a certain degree, be considered negative spillover effects of the use of GMOs. As a consequence, it can be summarized that companies that support the use of GMOs in food production have a very negative public image and are criticized for a variety of reasons. Positive correlations between the company's position towards GMOs and the claimed relevance of CSR, sustainability issues and a dialogue with NGOs support the hypothesis that a lack of social legitimacy increases the relevance of a systematic management of stakeholder relations and legitimacy.

Table 3. Correlations between the company's position towards GMOs and other aspects

How strongly do you perceive public pressure with regard to the following?	Our position towards GMOs	
	r	α
… Health incidents due to contaminants in food products	0.422***	0.00
… Characteristics of food products	0.231**	0.04
… Employee working conditions	0.277***	0.00
… Animal welfare issues (e.g., housing, transport)	0.318***	0.00
… Internal affairs (corruption, bad corporate governance etc.)	0.236**	0.03
… Effects on the external environment (emissions, waste water etc.).	0.384***	0.00
… Protests against suppliers' production methods	0.350***	0.00
My company is criticized by the wider public	0.260**	0.01
In the media our company is often negatively described in a one-sided way	0.263**	0.03
Scandals in our industry have resulted in lower turnover for our company	0.240**	0.03
Our industry has a bad reputation	0.238**	0.03
We consider CSR and sustainability unimportant	-0.256***	0.00
We are in dialogue with NGOs	0.289***	0.00

Notes: r= two-sided Pearson correlations; α= significance

Source: own investigation.

CSR in agribusiness companies

It can be derived from the results presented so far that agribusiness firms are subject to public pressure for various reasons, GMOs being only one of them. Zerfass and Scherer [1993] hypothesize that existing conflict lines force managers to better adapt company goals to their firms' social environments. CSR is often considered an instrument for gaining and sustaining societal legitimacy [Hiss 2006; Mueller and Seuring 2007]; therefore, it is highly relevant in the context of the GMO debates agribusiness firms face.

Despite the high relevance of CSR for agribusiness firms, hardly any research on this topic has been conducted so far. In order to explore the topic further, we analyzed the way agribusiness firms perceive their social responsibility and which CSR concepts have been implemented in order to meet strong public pressure, with regard to such issues as firm strategies towards GMOs.

Table 4 shows that agribusiness firms employ broad definitions of CSR; the vast majority of aspects that can be summarized under a firm's CSR concept are assessed positively and considered relevant elements of CSR. Only activities with regard to culture,

research and sports activities receive less support. Besides responsibility to employees with regard to job security, two other issues have close conceptual relationships with the GMO topic: responsibility to customers with regard to food product safety and responsibility for the environment.

Table 4. Answers to question. Which of the following do you consider to be important elements of a firm's 'corporate social responsibility' (CSR)?

Issue	μ	σ	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Responsibility for employees (n=169)	4.46	0.567	0 0.0%	0 0.0%	6 3.6%	80 47.3%	83 49.1%
Engagement in cultural, research and sporting activities (n=169)	3.18	0.819	5 3.0%	22 13.0%	87 51.5%	48 28.4%	7 4.1%
Revealing ethical values (n=169)	4.08	0.802	2 1.2%	7 4.1%	15 8.9%	97 57.4%	48 28.4%
Responsibility for the environment (n=170)	4.23	0.635	0 0.0%	0 0.0%	19 11.2%	93 54.7%	58 34.1%
Responsibility to suppliers (fairness) (n=168)	3.97	0.754	0 0.0%	4 2.4%	38 22.6%	85 50.6%	41 24.4%
Responsibility for and participation in the region (n=169)	3.95	0.868	2 1.2%	4 2.4%	44 26.0%	70 41.4%	49 29.0%
Taking democratic rights and duties seriously (n=169)	3.98	0.852	1 0.6%	7 4.1%	36 21.3%	76 44.7%	49 28.8%
Readiness to innovate, provide impetus for the economy (n=169)	4.10	0.814	0 0.0%	7 4.1%	27 16.0%	77 45.6%	58 34.3%
Providing job security (n=169)	4.21	0.723	0 0.0%	5 3.0%	15 8.9%	89 52.7%	60 35.5%
Responsibility to society (n=166)	3.93	0.813	1 0.6%	6 3.5%	37 22.3%	82 49.4%	40 24.1%
Responsibility to customers (product safety) (n=169)	4.54	0.598	0 0.0%	0 0.0%	9 5.3%	60 35.5%	100 59.2%
Making a profit (n=169)	4.17	0.698	0 0.0%	3 1.8%	20 11.9%	91 54.2%	54 32.1%

Notes: μ – mean; σ – standard deviation

Source: own investigation.

Against this background, it is not surprising that companies feel responsible mainly to their employees and customers. Furthermore, the interests of owners and stakeholders in the company's neighbourhood are taken into account. Firm managers, the state and NGOs are of minor relevance to agribusiness companies (Table 5).

The study also shows that, due to its high relevance and public visibility, CSR has become a top management issue. In 90% of the firms surveyed, the board is responsible for CSR. Communication and public relations (31%) as well as human resource management (26.8%) departments are also involved in CSR activities to a certain degree. It is mostly in

larger companies that a cross-cutting unit in which various departments collaborate is responsible for CSR.

Table 5. Answers to question. Whom do you mainly feel responsible to?

Issue	μ	σ	Not at all important	Less important	Neither important nor un-important	Important	Very important
Employees (n=170)	4.48	0.618	0 0.0%	1 0.6%	8 4.7%	69 40.6%	92 54.1%
Owners (n=161)	4.25	1.002	8 5.0%	2 1.2%	11 6.8%	60 37.3%	80 49.7%
Customers (n=170)	4.74	0.456	0 0.0%	0 0.0%	1 0.6%	43 25.3%	126 74.1%
State (n=168)	2.85	0.926	12 7.1%	46 27.4%	69 41.1%	37 22.0%	4 2.4%
Society in general (n=168)	3.51	0.875	1 0.6%	22 13.1%	54 32.1%	73 43.5%	18 10.7%
Managers (n=159)	2.87	1.062	17 10.7%	42 26.4%	53 33.3%	39 24.5%	8 5.0%
Suppliers (n=166)	3.63	0.884	1 0.6%	18 10.8%	47 28.3%	76 45.8%	24 14.5%
NGOs (n=165)	2.53	1.062	31 18.8%	53 32.1%	48 29.1%	29 17.6%	4 2.4%
Stakeholders in the local neighbourhood (n=164)	3.68	0.933	4 2.4%	12 7.3%	46 28.0%	73 44.5%	29 17.7%

Notes: μ – mean; σ – standard deviation

Source: own investigation.

Table 6 illustrates the CSR strategies that the agribusiness firms surveyed have implemented. Most respondents say that they publicly proclaim their corporate social responsibility, are well known for fair behaviour, put a strong emphasis on the promotion of employees and are environmentally friendly. The majority also confirm that they demonstrate good corporate citizenship, are engaged in social initiatives and oblige their suppliers to meet social and environmental standards. The picture is much more mixed with regard to other matters (Table 6).

In general, employees' engagement in social and charitable projects during leisure time (corporate volunteering) is of minor relevance, but employees of companies that are criticized for their position towards GMOs show stronger commitment to volunteering (0.203; $p < 0.01$; $α = 0.011$). The relevance of animal welfare and biodiversity issues correlates positively with the share of organic products a company sells (0.297; $p < 0.001$).

The quality of relationships with NGOs varies remarkably. Whereas many respondents avoid coming into contact with these groups, 30% say that they consider cooperation with NGOs potentially very helpful for implementing CSR strategies. Companies that are criticized for their position towards GMOs reveal closer relationships with non-profit organizations (NPOs; $r = 0.289$; $p < 0.001$).

Table 6. Answers to question. How does your company handle CSR issues?

Issue	μ	σ	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Our company publicly proclaims its corporate social responsibility (through, for instance, a corporate mission statement) (n=170)	4.01	0.933	3 1.8%	9 5.3%	28 16.5%	74 43.5%	56 32.9%
We oblige our suppliers to comply with social and environmental standards (n=169)	3.40	0.978	4 2.4%	24 14.2%	65 38.5%	52 30.8%	24 14.2%
We are in a dialogue with 'critical' stakeholders (such as NGOs) (n=164)	2.83	1.165	25 15.2%	39 23.8%	52 31.7%	35 21.3%	13 7.9%
We engage in social initiatives (e.g. social and cultural projects) (n=168)	3.53	0.935	5 3.0%	15 8.9%	56 33.3%	70 41.7%	22 13.1%
Our employees voluntarily engage in charitable projects during leisure time (corporate volunteering) (n=168)	2.90	0.962	16 9.5%	30 17.9%	84 50.0%	30 17.9%	8 4.8%
Environmental protection is very important to us (e.g. reduction of emissions and water consumption) (n=170)	3.99	0.810	1 0.6%	6 3.5%	32 18.8%	85 50.0%	46 27.1%
We put a strong emphasis on promoting our employees (through, for instance, training activities) (n=170)	4.01	0.717	0 0.0%	2 1.2%	37 21.8%	89 52.4%	42 24.7%
The advancement of our local neighbourhood (corporate citizenship) is very important to us (n=169)	3.60	0.847	2 1.2%	13 7.7%	57 33.7%	76 45.0%	21 12.4%
We are well known for fair behaviour (n=169)	4.05	0.666	0 0.0%	0 0.0%	33 19.5%	94 55.6%	42 24.9%
We actively promote biodiversity and animal welfare (n=166)	2.83	1.144	22 13.3%	44 26.5%	56 33.7%	29 17.5%	15 9.0%

Notes: μ – mean; σ – standard deviation

Source: own investigation.

There is a considerable number of management systems that support the implementation and control of sustainability and social responsibility issues. Our survey shows that ISO standards (9001 and 14001) and risk management systems are by far the most important systems applied. Roughly a quarter to a third of the companies has implemented environmental costing or ecological and social purchasing guidelines. Other systems, such as SA 8000, are currently of minor relevance in the agribusiness sector (Table 7).

Table 7: Answers to question. Have the following management systems been implemented in your company?

Specification	Yes	No	Planned
ISO standards (n=140)	93 66.4%	40 28.6%	7 5.0%
Risk management (n=137)	103 75.2%	25 18.2%	9 6.6%
Environmental costing (n=138)	33 23.9%	95 68.8%	10 7.2%
EMAS (Eco-Management and Audit Scheme) (n=132)	28 21.1%	101 76.5%	3 2.3%
EFQM model (n=132)	19 14.4%	109 82.6%	4 3.0%
Social purchasing guidelines (n=134)	32 23.9%	94 70.1%	8 4.7%
Ecological purchasing guidelines (n=133)	49 36.8%	76 57.1%	8 6.0%
CSR cost management systems (n=130)	12 9.2%	107 82.3%	11 8.5%
SA 8000 (Standard for Social Accountability) (n=131)	6 4.6%	116 88.5%%	9 6.9%

Source: own investigation.

Discussion and implications

For various reasons, agribusiness firms are facing increasing scrutiny and are severely criticized if their company policies do not meet stakeholders' expectations. The results of our study of German agribusiness firms show that public pressure is due mainly to the companies' position towards GMOs, environmental effects of production and food product characteristics, like high fat or sugar content. The legitimacy of an organization is essential for its long-term survival [Parsons 1960; Pfeffer & Salancik 1978]; it is threatened if company activities are no longer perceived as appropriate or in line with social standards and expectations [Suchman 1995]. Against this background, the strong resistance of a majority of EU consumers to GMOs has the potential to threaten the legitimacy of agribusiness firms, such as seed companies that are engaged in the development of GMOs, opt to use them or simply have problems avoiding the use of or contamination with GMOs (for instance, the feeding stuff industry). Multinational agribusiness firms face an additional problem since they have to deal with the very diverse attitudes towards GMOs in different parts of the world; such companies have to implement an overall strategy that, on the one hand, takes into account local attitudes towards GMOs and, on the other, avoids obviously contradictory behaviour with regard to GMOs in different regions.

CSR has been discussed as a concept for legitimating company activities by aligning a firm's objectives with the demands of its social environment [Hiss 2006; Mueller and Seuring 2007; Zerfass and Scherer 1993]. Our results show that, for agribusiness firms, high pressure on legitimacy in fact results in a growing relevance of CSR and sustainability issues. Companies that are criticized for their position towards GMOs, for instance, do not

consider CSR and sustainability unimportant (r = -0.256; p < 0.001). On the contrary, they engage in closer dialogues with critical stakeholders; this reflects their growing orientation towards the wider public (0.289; p < 0.001). Nonetheless, so far it is not well understood whether this behaviour is mainly motivated by traditional financial performance goals or whether it reflects a deeper belief in the moral necessity of acting in a socially responsible fashion. This could be a starting point for future research that analyzes in greater detail the determinants of implementation and design of the CSR strategies. In this context, how the perceived relevance of GMOs for a firm or industry influences the design of its CSR activities could also be analyzed.

Despite the undisputed relevance of CSR activities, such approaches are sometimes criticized by critical stakeholders as an obvious attempt to camouflage socially undesirable behaviour ('green washing') [Greer & Bruno 1996; Shultz & Holbrook 1999]. Against this background, the question how CSR contributes to a sustained legitimacy deserves more attention. Existing research indicates that credibility is essential for avoiding a situation in which CSR contributes to a further loss of legitimacy [Palazzo & Richter 2005]. If this cliff has been circumnavigated, CSR can contribute to higher firm profits due to improved legitimacy [Orlitzky et al. 2003], which reduces the probability of consumer boycotts, public protests or campaigns by critical stakeholders against firm activities [Hiss 2006]. The four columns of the CSR house (Figure 2) as well as the distinction between pragmatic, cognitive and moral legitimacy provide various starting points for implementing measures that contribute to (re-)gaining and sustaining legitimacy.

Many pro-GMO activists try to convince consumers and other stakeholders of the advantages of that technology by highlighting the contribution of genetic engineering to improved food security through breeding, for instance, salt- or water-stress–resistant crops. This can be a successful strategy for establishing pragmatic and cognitive legitimacy, but it will probably fail if the proposed advantages have little relevance for consumers, such as the resistance of crops against total herbicides. It will also fail with regard to deeply convinced opponents who question the moral legitimacy of GMOs. In this context, CSR strategies should stipulate a more intensive dialogue between firms willing to use GMOs and their opponents. It has repeatedly been stressed that open dialogues and discourses are one of the very few ways to alter deeply rooted beliefs [Suchman 1995]. Therefore, it can be considered appropriate that most companies have decided to allocate responsibility for CSR to higher hierarchical levels.

With regard to cultural change, Schein [1992] has pointed out how difficult a change can be. He conceptualized the dynamics of change as a three-step process: unfreezing, cognitive restructuring and refreezing. According to his observations, the motivation to change deeply rooted beliefs can only develop if three preconditions are met: (1) enough disconfirming data (for instance, GMOs contributing to food security or reduced use of pesticides), (2) enough anxiety or guilt resulting from the connection of the disconfirming data to important goals or ideals and (3) sufficient psychological safety in the sense that individuals see a possibility of solving the problem without loss of identity or integrity. It can be assumed that changing beliefs in the immorality of genetic engineering requires a similar process. Unfortunately, it is very difficult for managerial action to engender such a change [Schein 1992].

Our study has revealed that the agribusiness firms surveyed have accepted the challenges that the GMO debate in Europe poses and take it into account when designing

their CSR strategies. Due to the still growing relevance of CSR, we expect its further professionalization in agribusiness firms. In the longer run, this could result in the implementation of certification systems that allow independent third parties to externally audit a firm's social responsibility. In this sense, certification could act as means of meeting external pressures and institutionalized expectations with regard to firm behaviour [Walgenbach 2007]. This trend is accompanied by the development of social accounting methods. The idea of social accounting can be traced back to the 1970s, but it was not until the turn of the millennium and the growing relevance of CSR and sustainability issues that it gained more relevance. Today quite a large number of methods exist for measuring and documenting the economic, environmental and social sustainability of firm activities [Guidelines… 2009; Jørgensen et al. 2008].

The study presented here is only a first step on a long road to better understanding firm strategies with regard to GMOs and CSR. Future research should be based on larger samples from a variety of countries so that they are more representative of the European agribusiness sector. Moreover, more in-depth analyses of the contingency factors that determine firm's GMO and CSR strategies could provide valuable insights into how firm strategies are shaped and which influences they actually have on firm management and behaviour.

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Modelling wheat yields variability in Polish voivodeships

Abstract. The paper presents an analysis of wheat yields variability in the voivodeships of Poland. The main aim of the study was to find out what are the statistical relationships between the wheat yield variability and the following factors: arable area, size of wheat production area, share of arable land used for wheat production, land quality and average yield. For that purpose a multiple linear regression was applied. It was found out that the detected spatial autocorrelation of wheat yields variability measured by standard deviations can be explained in 75% by the fitted model. Two of the considered variables showed a significant negative effect on this variability: the logarithm of arable area and the land quality, while the other two: the average wheat yield and the wheat production area displayed a significant positive effect on the variability. The effect of share of arable land used for wheat production itself was not significant.

Key words: wheat yield, variability, production risk, spatial autocorrelation.

Introduction

The production risk is one of the dominant risks in the agricultural sector, particularly in plant cultivation. The most important factors influencing yield level are weather conditions, pest and diseases. Poland is a country of a relatively moderate size but the weather patterns and soil conditions are quite diverse. The same can be said about the interaction of weather and soil conditions and for that reason an aggregation should be avoided when assessing production risk in plant cultivation. Unfortunately voivodeships are the smallest area entities for which yield time series of reasonable length are available.

In previous work by the author [Kobus 2009] it was shown that the standard deviation for wheat yield (after trend elimination) takes values from 2 decitons per hectare (dt/ha) in Podkarpackie voivodeship to 5.4 dt/ha in Lubuskie voivodeship. It proves that even on the NUTS 2 level there exists a considerable unevenness of plant production risk, which is worth of analysis.

Such an irregularity of yield variability may be a result of many factors. Grønlund et al. [2006] found that 19% of wheat yield variability in Norway (at farm level) can be explained by 15 significant predictors, the highest ranking predictors were irrigation, winter wheat percentage in wheat sown area, pH and natural logarithm of farm area.

Other authors [Górski & Górska 2006] investigated a relationship between the level of data aggregation, from field plot data to national yields, and the yield variability. They found it negative.

The reason for the relationship between production area and yield variability can be explained on the ground of probability. Assuming that yield from each hectare is a random variable, an average of such variables is also a random variable but with a variance equal to

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the average variance of individual variables only in the case of full linear dependency between individual yields. As such perfect linear dependency is rarely observed in practice, the variance of an average yield on bigger number of hectares should be smaller.

On the other hand, increasing the production area moves the marginal field to less favourable area and it could result not only in lower yields but also in their higher variability. This could conceal or even negate the effect of larger production area. Consequently, to find out what are the effects of production area size and of incorporating less favourable area, both effects must be studied jointly.

Another factor which the above mentioned unevenness of plant production risk can be attributed to is the average yield level. It has been shown [Kobus 2010] that an average yield level displayed a positive relation with the wheat yield variability at country level. But in the subject matter literature, contradictive results can be found. Haberle and Mikysková [2006] carried out research in the Czech Republic at district level. They investigated 77 administrative units and found out fairly strong (r=-0.58) negative relation between the average wheat yield and its variability measured by the variation coefficient.

The main aim of this study is to find out what are the relationships between wheat yield variability and the following factors: size of arable land, size of wheat production area, share of arable land used for wheat production in the total arable land, land quality and average yield.

Apart from that a possibility of spatial correlation between yields variability in particular voivodeships will be investigated.

Data and research methods

The statistical data used in this analysis include the average yields of wheat in Polish voivodeships in years 1995-2007 and are available from Eurostat [Eurostat 2010], another source of data were the Central Statistical Office of Poland (GUS) [Rocznik… 2010] and Global Administrative Areas [GADM… 2010].

The following variables were used in the analysis:

AA – arable area, '000 ha

WPA – wheat production area, '000 ha

SPA – share of wheat production area in the arable land area, %

LQ – land quality

AY – average yield of wheat, dt/ha

SD – standard deviation of wheat yield after the linear trend elimination, dt/ha.

Apart from the arable area and wheat production area which were directly available from the Eurostat, all other variables were calculated by author basing on the Eurostat and GUS data. The description given above is sufficient for almost all variables but LQ. This is an artificial variable created for describing the agricultural quality of land. It is a compromise between the available data and accuracy.

In the statistical yearbook by GUS [Rocznik… 2010] on page 75, a table entitled 'Agricultural land by soil valuation classes and by voivodeships in 2000' is presented, with agricultural land classified by quality classes, with subclasses a and b in each class pooled. The LQ variable was calculated on the base of that table and coefficients for recalculation of actual into standardised quality hectares employed for taxation purposes in macroregion 2 (class I coefficient 1.8, II – 1.65, IIIa – 1.5, IIIb – 1.25, IVa – 1, IVb – 0.75, V – 0.3, VI –

0.15), while average coefficients for subclasses a and b were used as coefficients for land classes III and IV.

Table 1. Values of analysed data in Poland's voivodeships (1995-2007)

Voivodeship	AA, '000 ha	WPA, '000 ha	SPA, %	LQ	AY, dt/ha	SD, dt/ha
Dolnośląskie	864.8	283.9	32.8	0.933	40.6	4.5
Kujawsko-Pomorskie	972.6	197.3	20.3	0.868	38.4	3.7
Lubelskie	1275.3	296.0	23.2	0.923	31.4	2.5
Lubuskie	392.3	56.9	14.5	0.674	32.9	5.4
Łódzkie	958.9	103.2	10.8	0.664	30.7	3.4
Małopolskie	553.4	118.3	21.4	0.847	30.1	2.7
Mazowieckie	1641.9	156.0	9.5	0.665	31.2	2.6
Opolskie	491.8	154.3	31.4	0.939	45.9	4.7
Podkarpackie	587.9	130.6	22.2	0.845	30.0	2.0
Podlaskie	759.5	60.5	8.0	0.605	27.4	3.3
Pomorskie	689.0	142.5	20.7	0.786	41.6	3.6
Śląskie	415.2	67.4	16.2	0.740	34.8	4.1
Świętokrzyskie	515.4	89.1	17.3	0.820	28.6	3.2
Warmińsko-Mazurskie	835.9	153.7	18.4	0.811	36.8	2.3
Wielkopolskie	1542.5	218.9	14.2	0.702	40.4	4.7
Zachodniopomorskie	856.0	191.2	22.3	0.799	37.8	4.3

Source: own calculations based on [Eurostat… 2010] and [Rocznik… 2010].

For the analysis of data, two models were considered, a standard linear model of multiple regression and one of the models specific to spatial data analysis, namely simultaneous autoregressive model [Bivand et al. 2008]. The model of first choice was a linear model given by:

$$\mathbf{Y} = \mathbf{X}\boldsymbol{\beta} + \boldsymbol{\varepsilon} \tag{1}$$

where: $\mathbf{Y}$ – vector of dependent variables (standard deviations of yield SD), $\mathbf{X}$ – matrix of independent variables[2] (log(AA), WPA, SPA, LQ, AY), $\boldsymbol{\beta}$ – vector of regression coefficients, $\boldsymbol{\varepsilon}$ – vector of independent identically normally distributed random errors.

The problem which arises in the application of the above model to the analysed data is the independency of random errors. As the observations are area entities, it is possible that they are spatially autocorrelated. In such case it is inappropriate to use model (1) which assumes independency of random errors.

One of the most popular tests for detecting spatial autocorrelation is the Moran I test [Bivand et al. 2008]:

$$I = \frac{n}{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}} * \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}\left(y_i - \overline{y}\right)\left(y_j - \overline{y}\right)}{\sum_{i=1}^{n}\left(y_i - \overline{y}\right)^2} \tag{2}$$

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[2] The function log(x) is the natural logarithm of x.

where w_{ij} is the spatial weight of the link between areas i and j.

The matrix of spatial weights was constructed on the base of object's neighbourhood presented in Figure 1[3].

Fig. 1. Neighbourhood structure of Polish voivodeships

Source: own calculations, based on [GADM… 2010].

All of the statistical calculations were performed in R, an environment for statistical computing [R. A language… 2009] with help of the following packages: sp, rgdal, maptools, RcolorBrewer, classInt, spdep.

Results

The spatial distribution of standard deviation of wheat yield after the linear trend elimination, as shown in Figure 2, suggests that there exists a spatial autocorrelation of yield variability. It is clear that all the western voivodeships exhibit comparatively high values of wheat yield standard deviation, while the eastern voivodeships demonstrate low variability. This kind of clustering is typical for objects spatially correlated.

To confirm this visual impression and to quantify this spatial autocorrelation the Moran I test was applied. The value of Moran I statistic was 0.544 with p-value 0.0000113, which proves that variability of wheat yields expressed by their standard deviations is positively spatially correlated, i.e. a voivodeship with high yield variability is likely to have neighbours with similarly high variability.

Although the existence of spatial autocorrelation of yield variability was confirmed, it does not mean that a standard linear model can not be applied. The assumption in the model

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[3] The weight matrix in binary style, units for neighbouring voivodeships, otherwise zeros.

concerned the random errors and not the dependent variable itself. It is possible that a large part or even the whole of spatial autocorrelation can attributed to analysed factors.
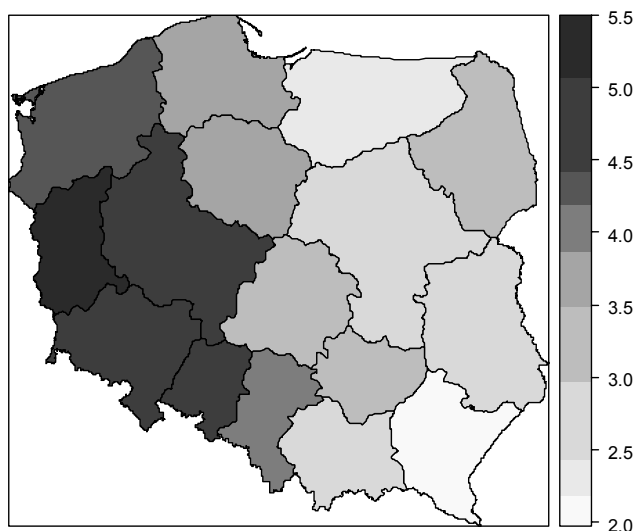
Fig. 2. Standard deviation of wheat yield void of trend, dt/ha (1995-2007).

Source: own calculations.

The results of multiple linear[4] regression model estimation are presented in Table 2. As presented, all variables but the share of wheat production area (SPA) display a significant relation to yield variability at significance level 0.05 and the land quality (LQ) even at that of 0.01.

Table 2. Results of multiple linear regression estimation

Variable	Coefficient estimate	Standard error	t value	p-value
(Intercept)	28.055	8.692	3.228	0.0091
log(AA)	-3.223	1.183	-2.723	0.0214
WPA	0.020	0.007	2.755	0.0203
SPA	0.207	0.663	0.312	0.7613
LQ	-12.920	3.534	-3.656	0.0044
AY	0.114	0.042	2.702	0.0222

Multiple R-squared: 0.7482, adjusted R-squared: 0.6222

Source: own calculations

The results of the used tests are substantial only if the model assumptions hold. To verify the assumption of random errors independence, the Moran I test for linear models

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[4] The name linear model does not imply that conditional expected value of dependent variable is a linear function of independent variable. It means that is a linear function of model parameters.

was applied. The value of Moran I statistic was -0.0867 with p-value 0.2231 for hypothesis of null spatial autocorrelation. It means that the spatial dependence of yield standard deviation detected in the previous test can be explained by the investigated factors.

Considering the value of multiple R-squared equal to 0.7482, the estimated regression function explains a large part, almost 75%, of variability of wheat yield standard deviations across Polish voivodeships. For testing of the second assumption (normal distribution of random errors) the Shapiro test was used, with the p-value for hypothesis of normality equal to 0.3438. Concluding, all assumptions of model (1) were confirmed.

Because the share of wheat production area (SPA) was not significant, the variable SPA was removed and the model was re-estimated. Results are presented in Table 3.

Table 3. Results from multiple linear regression without the variable SPA.

Variable	Coefficient estimate	Standard error	t value	p-value
(Intercept)	26.662	7.147	3.731	0.0033
log(AA)	-2.970	0.827	-3.593	0.0042
WPA	0.019	0.006	2.951	0.0132
LQ	-12.601	3.241	-3.888	0.0025
AY	0.106	0.033	3.240	0.0079

Multiple R-squared: 0.7457, adjusted R-squared: 0.6532

Source: own calculations.

Removing the variable SPA resulted in lowering multiple R-squared by only 0.0025 but in increasing adjusted R-squared from 0.6222 to 0.6532. All others variables remained significant with even lower p-values.

All considered factors show a fairly similar strength of influence on the yield standard deviation, but they can be ordered by absolute value of t statistics starting from the strongest: land quality (LQ), natural logarithm of arable area (log(AA)), average yield (AY) and wheat production area (WPA).

The most important are the signs of estimates, they inform on character of relation. A minus sign denotes a negative relationship while a plus sign a positive one. But before jumping to conclusions like 'the bigger wheat production area the bigger average yield variability' one thing must be made clear: the estimates presented in the Tables 2 and 3 come form a multiple regression model and their proper interpretation is that if, for instance, the average yield for a voivodeship increases by one unit (dt/ha), **and all other variables remain on the same level**, the yield standard deviation for that voivodeship will increase by 0.106 dt/ha. Bearing that in mind the conclusion 'the bigger wheat production area the bigger average yield variability' is an oversimplification, the bigger wheat production area without increasing total arable area means higher share of wheat production area and consequently expanding wheat production to less favourable areas. On the other hand the minus before estimate of the log(AA) coefficient means that increasing total arable area lowers yield variability, but it could also be an effect of a relatively decreasing share of wheat production area.

To asses the combined effect of increasing both arable area and wheat production area, the log transformation of arable area (AA) must be taken into account. An increase of arable area by 1 thousand hectare gives a higher increase of log(AA) for a lower reference

point then for higher. The log transformation simply results in constant reaction of dependent variable to increase of arable area (AA) expressed in percentages, while not transformed wheat production area (WPA) causes a constant reaction of depended variable to an increase of WPA expressed in thousands of hectares.

Discussion

The analysis of yield variability showed its significant relationship to 4 out of 5 considered factors, namely: land quality, natural logarithm of arable area, average yield and wheat production area. The share of wheat production area in total arable land was not significant.

The size of arable area and the land quality showed a negative relationship with the wheat yield variability while the wheat production area and the average wheat yield in a voivodeship showed a positive relationship. Those 4 variables explain together nearly 75% of wheat yield standard deviation unevenness among voivodeships. This is a very high value. In a research carried out in the Czech Republic [Haberle & Mikysková 2006], it was 35% and in Norway only 19%. The reason for such a high value of determination coefficient as observed could be the level of data aggregation. In the present study it was a voivodeship with an average size of arable area of 834.5 thousand hectare, while in the Czech Republic it was a district with an average size of arable area of 37.8 thousand hectare and in Norway it was estimated at the farm level.

The negative influence of arable area size on yield variability showed in this study agrees with results presented by Górski & Górska [2006]. Also, the negative influence of land quality agrees with results by Haberle & Mikysková [2006], where a positive influence of high proportion of fertile soils on an average yield and a negative one on its variability was shown.

In a previous paper by author [Kobus 2010] it was shown that an average yield level displays a positive relation with the wheat yield variability at country level. This study confirms that it is true also at the level of provinces, at least in Poland. In the Czech Republic [Haberle & Mikysková 2006], it was found out that such relationship is also significant but negative.

Those results are not necessarily contradictive. In present study variability was measured by standard deviations while Haberle and Mikysková used variation coefficient. Although variation coefficient is a well established and widely used measure of variability, it should not be used (in author's opinion) when investigating the possible relation of the average level of yield and the yield variability. The variation coefficient is a ratio of standard deviation to the average and consequently variation coefficients tend to be negatively correlated with averages even if standard deviations are not.

Conclusions

The results of the analysis confirm that an increase of wheat production area results in lower yield variability. But to have such a result this increase must be connected with expanding the total arable area. An increase of wheat production area achieved by simply

increasing its share in the arable land area will result in an increase of yield variability, which is supposedly a result of moving production to less favourable areas.

An increase of average yield results in a higher yield variability (in absolute terms). The land quality had a reducing effect on wheat yield variability.

The use of multiple regression allowed to determine an unmasked effect of considered factors and proved to be useful for modelling wheat yields variability in Polish voivodeships. Although in case of other crops or a different level of data aggregation, a possible spatial autocorrelation should be considered.

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Are export refunds necessary?

Abstract. The paper deals with the problem of export refunds in the EU agricultural trade. While examining Polish exports of beef and veal, an answer to the question is sought, if the exports refunds are necessary. The answer is positive, despite the fact that most probably the export subsidies in the EU will cease to exist after 2012.

Key words: agriculture, Common Agriculture Policy, export subsidies in Poland, beef, veal.

Introduction

The European Union supports farmers' income with three instruments:
- customs barriers and duties at the external borders of the EU
- internal support
- refunds (export subsidies).

In his study, the last instrument which has become particularly important for the Polish agricultural producers and exporters after Poland's accession to the European Union in 2004 is addressed.

As the Common Agricultural Policy is evolving, negotiations on the liberalisation of the world trade within the World Trade Organisation are carried out that also cover the problem of agricultural producers' competitiveness equalization in various world regions. A criticism of the non-European countries is primarily addressed to the export subsidies that have been applied in the European Community since its establishment, as in the opinion of the opponents the subsidies 'distort' the world trade. These opinions and various interests of particular EU Member States (as some opt for an expansion of industrial products and services in the third markets) have led to an initial agreement in the WTO forum that export subsidies for agri-food products will be abolished as of 2013.

Therefore, it seems important to examine, to a limited extent at the moment, the export subsidies in our country and the impact of their abolishment on our exports.

The refunds are intended to compensate the exporters for the fact that the prices of agricultural goods in the EU are usually higher than those prevailing in the third countries markets. These refunds are provided in the form of export subsidies.

According to the Council Regulation (EC) No 1234/2007, the European Commission can apply refunds to the cereals, rice, sugar, beef and veal, pork, eggs, poultry meat, milk and milk products, as well as to agricultural products used for production of the non-annex I processed goods (sugar, milk and dairy products, cereals, rice and eggs) exported outside the EU.

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Analysis

The analysis in this paper is limited to the subsidised exports of beef and veal from Poland in 2004-2008. Polish exports of these goods have an upward tendency and good prospects both in the EU market and non-EU markets.

Table 1 shows the refunds for these goods as compared to other subsidised products. The specification indicates that the refunded beef and veal have been sold to Russia, Kazakhstan, Kosovo and Macedonia. Forty one tonnes were exported to these four countries during the analysed period. How does it compare to the total exports of beef and veal? According to Table 2, Polish exports to the non-EU countries accounted for 50% of the total exports before Poland's accession to the EU.

Table 1. Export refunds in Poland, 2004-2008

Product	Amount of refunds, million PLN	Volume of exports with refunds, thousand tonne	Main destinations
Fresh/chilled/ frozen bone-in and deboned beef and veal	102.6	41.0	Russia, Kazakhstan, Kosovo, Macedonia
Pork: - canned meat - sausages - cooked ham - pork half-carcasses and elements (only in the period between 30.11.2007 and 08.08.2008)	104.4	100.6	USA, Azerbaijan, Republic of Korea, Ukraine (pork half-carcasses)
Poultry meat and eggs: - live poultry and hatching eggs, million piece - poultry meat, thousand tonne	9.5	165.1 2.8	Ukraine, Belarus, Moldova, Azerbaijan, United Arab Emirates
Milk and dairy products: - butter - milk powder - cheese	301.5	145.9	Russia, Algeria, Egypt, Morocco, Iraq, Tunisia, Saudi Arabia
Sugar	1 134.7	813.1	Russia, Uzbekistan, Tajikistan
Cereals	3.1	114.1	Belarus, Russia, Ukraine
Potato starch	25.1	117.9	Belarus, Russia, Ukraine
Fresh fruits and vegetables	21.4	185.4	Russia, Belarus, Moldova, Ukraine
Non-annex I processed products	113.3	282.1	Russia, Turkey, Egypt, Saudi Arabia
Total	1 815.6	1 802.9	x

Source: [Ocena… 2009] p. 97

After the accession this share significantly decreased, and in 2008 it accounted for less than 4% of the total exports, despite the repeal of Russia's embargo.

According to Table 5 the subsidised exports constituted a significant part of exports to the non-EU countries.

Table 2. Share of 'non-EU' beef and veal exports in the total exports, %

Share	Year					
	2003	2004	2005	2006	2007	2008
Percentage	55.56	19.97	13.79	5.10	3.68	6.04

Source: own study based on the data from Table 5.

Table 3. 'Unit values' and domestic prices of beef and veal

Element of calculation	Year				
	2004	2005	2006	2007	2008
'unit values' PLN/100 kg	522	633	590	535	716
PLN/EUR exchange rate	4,5	4,03	3,85	3,78	4,41
'unit value' EUR/100 kg	116	157	153	141	162
price in Poland EUR/100 kg	193		239	236	260
Difference: domestic price – 'unit value'	77		86	95	98
Highest refund rates in EUR/100 kg	172		121	85	85

Source: own calculations based on data from table 5 (volumes and values), table 7 (refund rates). The exchange rates are taken from the official statistics [Rocznik… 2005-2009 passim].

Table 4: 'Unit values' in the exports of beef and veal to the EU countries and outside EU as compared with domestic prices

Price	Year				
	2004	2005	2006	2007	2008
'Unit value'in exports to the EU countries, EUR/100 kg	201	238	244	247	224
'Unit value' in exports to the non-EU countries, EUR/100 kg	116	157	153	141	162
Price in Poland, EUR/100 kg	193		239	236	260
Average EU price	275		318	304	322

Source: own calculations based on data from table 5 (volumes and values) and on the figures in table 3.

In 2003, the share of exports to the non-EU countries was still very high and amounted to over 55% in the total exports. After the accession of Poland to the European Union this share dramatically decreased below 20%, and even more during the 2005-2007 period following the Russian embargo imposed on animal products from Poland. The export increased again only in 2008.

Since 2005 virtually the entire beef and veal exports to the non-EU countries have been subsidised. In 2004-2008, the subsidies amounted to PLN 102.6 million as shown in Table 1.

As a matter of fact, Polish exports were limited to 3 groups of goods according to Table 6.

Table 5. Polish exports of beef, pork and pork preparations, including subsidised exports

Exports	Volume in year , thousand tonne						Value in year, million PLN					
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2008
Exports of beef and veal (CN 0201, 0202) in total	44.1	67.1	118.2	160.9	171.0	195.5	277.3	555.2	1081.8	1483.7	1569.4	1899.4
including: to the EU-15/25/27[3]	19.6	53.7	101.9	152.7	164.7	183.7	168.9	485.3	978.6	1435.3	1535.7	1814.9
to the non-EU countries	24.5	13.4	16.3	8.2	6.3	11.8	108.4	70.0	103.2	48.4	33.7	84.5
Subsidised exports	0.0	3.8	14.7	8.0	6.8	7.7	x	x	x	x	x	x
Export subsidies	x	x	x	x	x	x	0.0	11.1	47.0	21.0	14.4	9.1
Share of subsidised exports in the total exports to the non-EU countries, %	0.0	28.4	90.2	98.0	108.0[b]	65.3	x	x	x	x	x	x
Share of subsidies in the value of exports to the non-EU countries, %	x	x	x	x	x	x	0.0	15.8	45.5	43.4	42.7	10.7

Source: as in Table 1, p. 200.

Table 6. Refunds paid to exports of beef and veal

Commodity	Year									
	2004 (since 1 May)		2005		2006		2007		2008	
	volume, thousand tonne	value, million PLN	volume, thousand tonne	value, million PLN	volume, thousand tonne	value, million PLN	volume, thousand tonne	value, million PLN	volume, thousand tonne	value, million PLN
Fresh, chilled in-bone beef and veal, carcasses and half-carcasses	2.3	5.8	9.6	21.3	3.7	6.1	2.0	2.3	3.3	3.2
Fresh, chilled deboned beef and veal	0.5	3.2	3.8	23.4	3.3	13.7	3.4	10.8	1.7	3.8
Frozen deboned beef and veal	1.0	2.1	1.3	2.3	1.0	1.2	1.4	1.3	2.7	2.1
Total	3.8	11.1	14.7	47.0	8.0	21.0	6.8	14.4	7.7	9.1

Source: as in Table 1, p. 99.

Some basic questions raised in the study should be answered. To what extent does an export subsidy cover the difference between the domestic beef and veal prices and the export prices? In other words, would the Polish exporters manage without the export subsidies? We need three following elements to calculate this:

- domestic prices
- export refund rates
- prices obtained for exported goods.

In 2004-2006 the prices of beef (price of slaughter cattle in terms of meat) in the EU showed gradual yet stable growth. They rose from 275 to 318 EUR/100 kg, i.e. by about 7% a year. In 2007, the price of beef fell by 4% (it was 304 EUR/100 kg) and grew again to 322 EUR/100 kg in 2008. In Poland, the average beef prices were significantly lower than in the Community, but the tendencies of changes were the same, although their intensity was different. During the first two years after the accession the price of beef went up from 193 to 239 EUR/100 kg, or by 23.8%. In 2007 the price of beef fell by almost 1.5% (to 236 EUR/100 kg) to rise again in 2008 and reach 260 EUR/100 kg (i.e. by 10%).

Table 7. The refund rates for beef and veal exports, EUR/100kg

Commodity	Year				
	2004	2005	2006	2007	2008
Fresh, chilled in-bone beef and veal, carcasses and half-carcasses					
0201 20 20 9110	56.5 - 97.0	41.1 - 97.0	28.7 - 69.8	28.7 - 48.8	28.7 - 48.8
0201 20 30 9110	43.0 - 71.5	30.8 - 71.5	21.5 - 52.4	21.5 - 36.6	21.5 - 36.6
0201 20 50 9110	71.5 - 123.0	51.4 - 123.0	35.9 - 87.3	35.9 - 61.0	35.9 - 61.0
Fresh, chilled deboned beef and veal carcasses					
0201 30 00 9100	102.0 - 172.0	71.3 - 172.0	49.8 - 121.3	49.8 - 84.7	49.8 - 84.7
0201 30 00 9120	56.5 - 94.5	42.8 - 94.5	29.9 - 72.8	29.9 - 50.8	29.9 - 50.8
Frozen deboned beef and veal 0202 30 90 9200	13.3 - 46.0	10.8 - 46.0	7.5 - 32.3	7.5 - 22.6	7.5 - 22.6

Source: as in Table 1, p. 99.

Export refund rates in the analysed period are presented in Table 7. Unfortunately, there are no real prices of export transactions available. Thus, we can assume approximate prices, or so called "unit values" obtained after dividing the export value by the export volume. To this end the Table 5 data are used, and the value of export to the 'non-EU countries' is divided by its appropriate volume. Table 3 shows the results of these calculations and other estimates.

The figures in Table 3 clearly indicate that export subsidies stopped to cover the price difference as early as in 2008. The reason behind it is the method of fixing refund rates according to 'the lowest offer wins' rule, and the need to accustom the exporters to the lack of export subsidies in the next few years. Polish exporters would lose if they were not able to take advantage of the subsidies. Their losses would, however, be smaller than those of the 'old EU' operators. This dependency results from the above mentioned differences between the average beef and veal prices in the EU and Poland.

We may still make another comparison of the 'unit values' in exports to the EU and outside the EU.

In general, the prices at which beef and veal is sold in the EU are higher than those on the third markets. The prices of meat sold to the Community were higher than the domestic

prices, except in 2008. This can indicate a permanent tendency of growth of beef and veal prices in Poland. However, it will still take a long time to reach the average EU price level.

Conclusions

At least two conclusions can be drawn from the above considerations:
- exports to the EU market should be continued, as the prices obtained there are advantageous
- in the case of meat exports to the non-EU countries (Poland has recently been trying to export goods to China, Japan and Korea), it should be borne in mind that not only the transportation costs are high, but also the sale prices are lower and the disappearing export subsidies cannot compensate losses in such exports.

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Economic appraisal of flood protection projects

Abstract. A model of the economic appraisal of flood protection projects using the NPV indicator is presented with a recent enlargements concerning economic valuation of casualties and psychological losses in victims' well-being. This year's series of big floods in Poland has made this topic come back to public attention.

Key words: flood, casualties, losses, economic appraisal.

Introduction

This year's (2010) series of big floods in Poland has turned the public attention again to the issue of flood protection, its costs, effectiveness and the losses in case it is insufficient. The frequency of big floods in this country seems to rise, we experienced big events of the kind in 1997, 2001 and this year. Żuławy is a region in Poland where smaller or bigger floods happen every year. The model presented below was constructed originally for use in appraisal of flood protection measures taken in this region after a big flood of 1983 [Manteuffel 1986 & 1987]. It has also partly taken advantage of a feasibility study of another flood protection project conceived after another flood in 2009 [Studium… 2010]. Both applications have dealt in most part with floods in rural areas which gives grounds for publishing this paper in an agricultural economic journal.

Model

The standard NPV (Net Present Value) method is the most suitable for an economic appraisal of long lasting projects like those sacrificed to flood protection. The general formula for calculating an NPV indicator runs as follows

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$$NPV = \sum_{t=0}^{T} \frac{1}{(1+R)^t} * (B_t - C_t)$$

where:

NPV – indicator of project's economic efficiency being an algebraic sum of benefits (+ sign) and costs (- sign) occurring in individual years of projects lifetime, beginning with the start of investments and ending with the last anticipated effects of its functioning, all discounted to the present moment of making a decision on its execution

B_t – benefits obtained thanks to the project's execution in year t

C_t – costs borne (represented by both investments and operation & maintenance outlays) within the project in year t

R – discount rate

T – time horizon of the calculation, which means the last year the benefits and costs will occur

t – current index meaning year's number.

Both benefits and costs are inserted in form of money flows or economic values of outputs and inputs at the time of their occurence.

The NPV indicator tells us what is the present value of net effects brought by the project over its whole economic lifetime, i.e. what the project is worth at present. A positive value of NPV (> 0) signifies the project is economically efficient and worth execution.

Flood protection projects have as a rule multiple beneficiaries and are financed from multiple, mostly public funds. Therefore their appraisal usually requires a cost-benefit analysis from both microeconomic (from the perspective of individual stakeholders) and macroeconomic (from the general social perspective, regardless of who bears the costs and who enjoys the benefits) point of view. The first case is nowadays usually called financial, the other economic analysis, in particular in the feasibility studies supplementing the applications for the EU subsidies [Guide… 2003]. Both types are in fact economic analyses, but the first one has first of all the aim of exploring the project's financial feasibility for the main investor. Flows of economic values caused by a project (traditionally called cash or money flows, though in the social analysis they have frequently non-monetary character) in many cases differ significantly between a social and an individual perspective. A standard procedure is to begin with a financial analysis and then to revalue individual flows to their social value, moreover with adding some non-monetary flows [Guide… 2003; Studium… 2010]. This paper will not deal with multiple ensuing, sometimes complicated, problems arising from this double valuation.

If a project covers a vast protected area, it can be usually divided into a series of sub-projects which are aimed at protecting only some subdivisions of the whole area, though in many cases depending on functioning of some structures or installations common to the whole project. However, the other sub-projects do not depend on existence of a particular sub-project and can do without it. Therefore some investment and operational outlays which are connected with only one individual subdivision of the total area are treated separately in the model, in order to make possible their elimination in case of a need to curtail the project.

Benefits can usually be easily assigned to individual subdivisions of the total protected area.

In the light of above said the general formula should be extended to a form of

$$NPV = \sum_{t=0}^{T} \frac{1}{(1+R)^t} * (B_{it} - \sum_i C_{it} - CC_t)$$

where:

i – index number denoting the serial number of an individual subdivision of the project

C_{it} – costs which can be assigned only to the i-th subdivision of the project, in year t

CC_t – costs which can be assigned only to the project as a whole, in year t.

There are many types of floods which may occur on the area to be protected[3]. Each of them has a certain probability of occurrence which is a function of a specific water level.

The probability function of occurrence of different water levels can be approximated by a matrix representation in which the function values are discretised for certain water levels singled out (or rather singled out intervals of water level) and it can be estimated basing on historical hydrological data.

Connected with this function is another one which describes the probability of food occurrence when a specific water level occurs. Connection between a water level and flood occurrence can be in many cases treated only in probability terms. A flood need not necessarily come with a certain water level, it may depend on the effectiveness of the anti-flood action or on time a certain level is maintained. This occurrence depends also on the state of existing flood protection structures. This state in turn is usually a function of time. Therefore this matrix (if we approximate the function by its matrix form) has also a time dimension.

The final function of flood occurrence can be represented as a matrix of products of these two probabilities.

If there is such a need, matrices of this type should be prepared for each type of flood separately. Not all types of flood are observed in some neighbourhoods.

The main and generally acknowledged effect of flood protection is a reduction of losses in property situated in protected areas. This property can be divided into relatively homogenous categories and inside these categories into still more homogenous subcategories. The homogeneity refers to relatively similar values of loss coefficients in case of a similar flood events. Depending on the availability of data, these coefficients can have a percentage form, when the property has been evaluated in monetary units, or a monetary form in case the property is given in natural units. A classification like the above usually facilitates the estimation of flood losses. The losses should include not only the loss in property substance, but also the losses due to an interruption of normal functioning of the structures or installations damaged, like an interruption in electric energy supply to households or in production activity, like cow milking.

Since the calculation covers a long time span, changes in the volume and value of protected property can be expected. Therefore a prognosis of these changes is needed. The most popular types of this forecast are a linear model (repeated annual increase by a constant percentage of the initial value) and a geometric (exponential) model (annual increase by a constant percentage of the previous year's value). Stagnation is also possible,

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[3] Summer precipitation floods, spring snowmelt floods, winter ice-jam provoked floods, sea storm water compouding floods.

but in normal times people's wealth usually grows. In extreme cases also a decrease in property value may occur, if some other locations become comparatively more attractive for investments.

It can be taken for granted that the growth in property value will be much quicker in case of an increased protection due to the project's implementation, since investors are usually quite risk sensitive.

The savings in flood losses can be calculated as

$$L_{it} = \sum_{jk \, ln} P_{ijk} * (PLC_{ijklm} + ILC_{ijklm}) * (PGCWt_{ijkt} * FPWt_{ilmt} - PGCW_{ijkt} * FPW_{ilmt})$$

where:

L_{it} – expected value of avoided losses in area i in year t

P_{ijk} – initial value (or volume, depending on units the property loss coefficient is measured in) of protected property in category j, subcategory k, situated in area i

PLC_{ijklm} – property loss coefficient in case of flood type m with water level l specific for property in category j and subcategory k situated in area i[4]

ILC_{ijklm} – income loss coefficient in case of flood type m with water level l specific for property in category j and subcategory k, situated in area i, caused by an interruption in normal economic activity attached to this property

$PGCWt_{ijkt}$ – property growth coefficient for property in category j, subcategory k, situated in area i, until year t, in case without project implementation

$PGCW_{ijkt}$ – property growth coefficient for property in category j, subcategory k, situated in area i, until year t, in case with project implementation

$FPWt_{ilmt}$ – occurrence probability for flood type m with water level l, situated in area i, in case without project implementation

FPW_{ilmt} – occurrence probability for flood type m with water level l, situated in area i, in case with project implementation.

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[4] In a study of the post 1983 flood project in Żuławy, data from a statistical report on real property situated in individual communes prepared by the Central Statistical Office in 1978 and from local post flood reports were used which have since then probably lost their significance [Manteuffel 1986]. The protected property was in this rural area divided into the following categories, then divided into subcategories:

- roads
- railroads
- energy installations
- telecommunication
- other infrastructure, shops, public utility buildings
- dwelling houses and farm buildings
- centres of big farms (then state or cooperative owned) and agricultural service stations (like tractors and agricultural machinery repair shops)
- livestock
- crop fields as well as irrigation and drainage installations.

The loss coefficients had a form of a flat sum per natural unit for a specific subcategory, e.g. per hectare of a flooded field. They were estimated basing on indemnities paid to the flood victims by a state-owned insurance company. Since it was a winter flood, some losses were noticed only in winter barley and winter raps. The other crops did not yield less than in non-flooded fields.

In the other quoted study, the loss coefficients were taken from insurers' estimates, for multi-family dwelling houses they equaled 5% of building's value and 25% of house equipment [Studium… 2010].

Another vital component of increased flood protection effects can be identified as an additional intensification and development of economic activities in consequence of an increased flood safety in the area. This might be calculated as

$$IEF_{it} = \sum_{jk} P_{ijk} * (PGCW_{ijkt} - PGCWt_{ijkt}) * PR_{ijk}$$

where:

IEF_{it} – intensification effect in area i in year t

PR_{ijk} – net annual productivity of property in category j and subcategory k situated in area i.

Among the effects of a flood protection project may also be counted the saved operation & maintenance costs of the existing flood protection structures and installations which will be replaced by new ones in case of project's implementation. Let them be noted as $OMCWt_t$ (O&M costs without the project).

Next effect in a row is saving costs of both anti-flood and flood relief actions. If the frequency of floods is reduced, so are the costs of these actions. The saved costs can be calculated as

$$CFAS_{it} = \sum_{lm} CFA_{ilm} * (FPWt_{ilmt} - FPW_{ilmt})$$

where:

$CFAS_{it}$ – presumptive avoided costs of anti-flood and flood relief actions in area i in year t

CFA_{ilm} – presumptive costs of anti-flood and flood relief action in area I, in case of flood type m with water level l (for the sake of simplification it can be assumed they are independent of the rise in the protected property value).

In a recent study by Liziński, Bukowski and Wróblewska [Studium… 2010], another two effects have been considered, not included in the original model. First of them was the economic value of casualties avoided thanks to the enhanced flood protection.

The economic value of a human life lost has been a frequent topic of research over the last decades. In Poland, a thorough work in this field was done by Giergiczny & team [Giergiczny 2006; Markiewicz 2007]. Estimated by using two methods, the values differed significantly. When the method of compensating wage differentials (increase in wage that induces people to take a job risking a fatal incident) was used, a mean VSL (value of statistical life) was estimated by Giergiczny [2006] at 9.1 million PLN in 2005 prices, or at 4.49 million PLN quoted by Markiewicz [2007]. When a contingent valuation method was used (a survey of a representative sample from population, asking respondents with direct questions) an interval between 0.28 and 4.01 million PLN is quoted by Markiewicz [2007].

The economic value of casualties avoided is no doubt an effect of flood protection. It can possibly be portrayed by an estimation of number of casualties caused by a specific flood multiplied by VSL

$$CCA_{it} = CA_{ilm} * VSL * (FPWt_{ilmt} - FPW_{ilmt})$$

where:

CCA_{it} – social cost of casualties avoided in area i, in year t

CA_{ilm} – casualties in case of a flood of type m with water level l, in area i

VSL – value of statistical life (a simplification, since certainly the social values of life of different individuals differ a lot, and flood casualties can hardly be treated as typical for the whole population).

Another effect considered by Liziński, Bukowski and Wróblewska [Studium… 2010] was the avoided detrimental psychological effect floods cause in the well-being of inhabitants of the flood endangered areas. Their investigation, by means of the contingent valuation method, gave as a result 540 PLN/adult person/year for dwellers and 4 times the material losses for the businessmen whose activity was located in the endangered area [Studium… 2010]. Therefore the total psychological (welfare) effect can be calculated as

$$WE_{it} = DN_{it} * PED_{it} + BN_{it} * PEB_{it}$$

where:

WE_{it} – welfare effect of flood protection in area i and year t

DN_{it} – number of dwellers in area i in year t (the number of dwellers may change with time)

PED_{it} – psychological effect per inhabitant of area i in year t, represented by his/her willingness to pay for avoiding the fear of flood (his/her risk aversion expressed in terms of willingness to pay may change with time)

BN_{it} – number of businessmen in area i in year t (their number may change with time)

PEB_{it} – psychological effect per businessman in area i in year t represented by his willingness to pay for avoiding the fear of flood (his risk aversion expressed in terms of willingness to pay may change with time).

Total effects in area i in year t sum up to

$$B_{it} = L_{it} + IEF_{it} + CFAS_{it} + CCA_{it} + WE_{it}$$

Total effects (benefits) of a flood protection project would then become

$$B_t = \sum_i B_{it} + OMCWt_t$$

The $OMCWt_t$ costs (or, in a NPV calculation rather expenses) can be divided into those assigned to individual protected areas and to the project as a whole.

A more detailed formula for an NPV calculation takes a form of

$$NPV = \sum_{t=0}^{T} \frac{1}{(1+R)^t} *$$

$$[\sum_i (L_{it} + IEF_{it} + CFAS_{it} + CCA_{it} + WE_{it} + OMCWt_{it} - IC_{it} - OMC_{it}) + OMCWt_t - IC_t - OMC_t]$$

where:

IC_{it} – investments which can be assigned only to the area i, in year t

IC_t – investments which can be assigned only to the project as a whole, in year t

OMC_{it} – operation & maintenance costs which can be assigned only to the area i, in year t

OMC_t – operation & maintenance costs which can be assigned only to the project as a whole, in year t

$OMCWt_{it}$ – avoided operation & maintenance costs which can be assigned only to the area i, in year t, in case without project

$OMCWt_t$ – avoided operation & maintenance costs which can be assigned only to the project as a whole, in year t, in case without project.

This type of analysis can be applied to individual areas separately, by skipping the costs and benefits connected with other areas and the whole of the project, in order to check if including protection of an individual area is worthwhile.

Among many other efficiency indicators basing on the NPV, the most popular are its equal annual equivalent and internal rate of return.

$$EAE = NPV * \frac{R * (1 + R)^T}{(1 + R)^T - 1}$$

where:

EAE – expected annual equivalent of NPV, denoting an equal every year net effect of the project over its whole lifetime when the discount rate is R.

Internal rate of return (IRR) means a value of the discount rate which drives the NPV down (or upwards in projects with a negative NPV) to zero. The bigger the IRR the better, since it means that the benefits which come naturally later than the costs (investments in particular) must be discounted stronger in order to make them equal with the costs that come earlier. This rate can be compared with the usual rate of interest applying to investor's capital (its opportunity cost). Since the NPV calculations are usually made in constant (fixed) prices, real (and not nominal) values of rates are compared.

Risk analysis

A decision under risk is the one that depends on aleatory values of certain variables whose probability distribution is known to the decision maker.

In the economic analysis of such decisions, a risk analysis is routinely required [Guide… 2003]. A standard procedure in this case is the so called Monte Carlo analysis.

This analysis makes use of the known distributions of external variables influencing the final result, in the present case the NPV indicator. Parameters of these distributions (in case of the most frequent normal distribution it is the mean and the standard deviation) are fed into the computing programme. Then, a long series of runs computing the dependent variable (in this case the NPV, according to the above presented model) is made with different possible values of the external variables generated by an aleatory numbers generator. Such generators are built into many computer applications, including the most popular spreadsheet programs like Excel. The series of results gives a sample distribution of results which is treated as a base for estimating the probability distribution of analysed variable and therefore as a base for estimating the stability of results within certain value brackets and the risk attached to the venture. Risk means in this case the probability of getting an unfavourable result, a negative NPV in particular. For larger models, a number of trial runs above 500 is practically advisable.

In the above presented model, the variables most susceptible to random variation and therefore predestined for a Monte Carlo analysis seem to be [Manteuffel Szoege 2003; Studium… 2010]:

- PLCijklm – property loss coefficient in case of flood type m with water level l, specific for property in category j and subcategory k, situated in area i

- ILC_{ijklm} – income loss coefficient in case of flood type m with water level l, specific for a property in category j and subcategory k, situated in area i, caused by an interruption in normal economic activity attached to this property
- $PGCWt_{ijkt}$ – property growth coefficient for property in category j, subcategory k, situated in area i, until year t, in case without project implementation
- $PGCW_{ijkt}$ – property growth coefficient for property in category j, subcategory k, situated in area i, until year t, in case with project implementation
- $FPWt_{ilmt}$ – occurence probability for flood type m with water level l, situated in area i, in case without project implementation
- FPW_{ilmt} – occurence probability for flood type m with water level l, situated in area i, in case with project implementation
- PR_{ijk} – net annual productivity of property in category j and subcategory k, situated in area i
- CA_{ilm} – number of casualties in case of a flood of type m with water level l, in area i
- PED_{it} – psychological effect per inhabitant of area i in year t, represented by his/her willingness to pay for avoiding the fear of flood
- PEB_{it} – psychological effect per businessman in area i in year t represented by his willingness to pay for avoiding the fear of flood.

Distributions of these variables can be taken for relatively independent, though some parallels might be detected in some cases and therefore parallel values used in individual trial runs.

In a simplified attitude to the risk analysis an analogous determination (using the same randomly generated parameter value) of variable values over the whole time horizon is assumed. This could be treated as generating generally more or less pessimistic or optimistic variants of the future aleatory conditions. A more precise attitude would allow for an independent determination (generation) of a random variable value in each year of the analysis. In a still more sophisticated attitude, a stochastic dependence between values in neighbouring years could be applied. Both would, however, require a lot more sizeable computational effort of a doubtful final usefulness.

A sensitivity analysis makes another part of risk analysis frequently applied. It simulates the behaviour of final result as a consequence of a certain probable change in value of a parameter vital for the calculation. Changes of a significant and rounded magnitude are usually tried, like 10%, 20% or 50%. In the presented case, varying the $PGCWt_{ijkt}$ and $PGCW_{ijkt}$ parameters, most probably with uniform variation for all t years, seems to be worth trying. The sensitivity analysis may concern also some external economic parameters, like the wages growth, energy prices growth and services prices growth, all in real terms, which would influence future costs of the project, both borne and avoided [Studium… 2010].

Flood damages

Natural conditions in our country are favourable for human settlement, also from the perspective of flood dangers. Big floods, however, occur in Poland with a frequency of

several years and this frequency seems to have risen in the last decades. The material losses naturally also rise together with the growing, in peaceful times, national wealth. These losses depend on the intensity of human activities in the endangered areas. Therefore one of the principles of flood protection is to avoid locating valuable investments in these areas and to construct protective structures in the second order [Johnson 1976; Lind 1967]. Potential losses should be in advance calculated as a part of hardly evitable costs in the feasibility studies for investments located in the endangered sites [Stedinger 1983]. Steadily progressing urbanization of natural lands makes a great difference in the precipitation water outflow because of hardening the ground surface, from a ratio surface/underground outflow of 10%/90% to a ratio of 60-90%/40-10%.

Table 1 displays very rough estimates of flood losses in our country in the last decades, in years of big floods.

Table 1. Estimates of flood damages subsequent to big floods of national scale in Poland

Type of damage	Year											
	1934[5]	1958	1970	1977	1979	1980	1981	1982	1983	1997	2001	2010[6]
Flooded area, thousand hectare	250	352	156	215	470	1745	80	111	14	521	402	400
Destroyed and damaged buildings, thousand	22.0	27.0	23.0	10.0	17.7	26.0	7.5	6.6	1.0	72.39	25.9	2
Damaged and destroyed bridges	102	1207	1400	612	147	135	29	617	47	4048	2254	1469
Destroyed and damaged state roads, km	100	596	751	2321	478	348	68	618	140	14432	56343	81160
Destroyed and damaged flood dams, km	100	330	100	38	118	14	47	94	29	721	450	185
Number of person evacuated, thousand	0.1	55.6	35.0	20.0	33.2	4.0	1.3	16.0	2.0	150.0	20	23
Casualties	x	x	x	x	x	x	x	x	x	54	18	9
Losses, million PLN, price level 2009	979	1201	1587	2670	1877	5384	589	879	438	21108	4108	10000

x means data not available to the authors

Source: own calculations and [Borowski 1984; Powódź 2010 będzie… 2010; Już… 2010; Ochrona… 1995-2009 passim; Środki… 2010; Mazik… 2010].

Once the property is reckoned to be worth protecting, the adequate structures should be built and well maintained. Unfortunately this is not the case in our country.

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[5] Losses of 1934 recalculated to the 1999 price level by dividing the losses by the exchange rate to the USD in 1934 (5.3 zloty/USD), multiplied by the average rate in 1999 (3.98 PLN/USD) and by the USD inflator in years 1934-1999 equal to 12.42 [U.S. Department… 2003]. Other losses recalculated with the Polish consumer price index.

[6] Losses recorded and reported for the period up to July 22nd 2010, not final data, price level 2010.

The probably most known example are dry polders in the outskirts of Wrocław built in German times and after the war inconsiderately converted into residential quarters of the city. For some reasons a flood dam there has never been constructed [Powódź 2010: można… 2010]. Governmental plans of construction or reconstruction of a series of flood dams and flood water reservoirs conceived in 2007 were nullified after a change in power next year.

Before the flood of 1997, 25% of existing flood dams in Poland needed an urgent reconstruction, the same applied to 20 out of 240 flood water reservoirs [Ambrożewski 1997]. This seems to be a permanent state, since the budgetary allotment for construction and reconstruction of flood dams in the 80ies covered only between 20% and 30% of the needs [Bartoszek 1997]. In March 2010, the Chief Controlling Chamber stated that a half of flood dams in the Małopolska region (worst flooded in May and June) did not guarantee safety because of their state [Znowu… 2010].

The permanent deficits in public finances cause big delays in payments to the construction firms for the reconstruction works on flood dams, sometimes driving them to the brink of insolvency [Szczygielski 2002]. Meanwhile their work does count, e.g. the flood of 2001 destroyed 10% (in value terms) of the main water regulating structures in the country [Kaca, Lipiński & Mosiej 2002].

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Possible economic consequences of the free trade area creation between the European Union and Ukraine for the agri-food sector

Abstract. This paper investigates the possible development of Ukrainian agriculture in terms of creation of a free trade area (FTA) with the European Union. Prospects for export-import relations between Ukraine and the EU as well as the competitiveness of domestic agricultural goods in domestic and foreign markets are analyzed. An economic-mathematical model was used for determining negative and positive consequences of the FTA formation for grain, dairy and meat industries. It is expected that the current positive Ukrainian trade balance in agri-food products will decrease significantly as a result of the trade liberalization. The analysis also shows possible changes in the gross domestic product, trade, level of economic activity, human welfare etc. Suggestions how to avoid the negative effects of the FTA on agricultural markets in Ukraine have been developed.

Key words: agricultural products, liberalization, free trade area, European Union.

Introduction

In Ukraine, the priority of an European integration is officially set, with a simultaneous development of mutually beneficial cooperation within the framework of other regional agreements with countries of the Commonwealth of Independent States (CIS), the Black Sea Economic Cooperation (BSEC) etc. Accession to the WTO on 16 May 2008 has created background for starting talks on formation of a FTA between the EU and Ukraine, which would nowadays fully meet foreign economic interests of both parties.

The process of free trade area formation includes: an implementation of zero tariff for a free movement of goods, services and capital, and in the future for a free movement of labour; a significant reduction of non-tariff barriers to trade through harmonization or mutual recognition of technical standards; a convergence of domestic regulatory standards with the European norms and best international practices in services trade; improvements in competition policy, corporate governance and internal market regulation according to the European principles, a harmonisation of individual and environmental protection standards; a provision of necessary support, including technical assistance, for investments in infrastructure, education and training.

A particular attention during the negotiations is given to defining the parameters of agricultural products trade. At the negotiations both sides declared goal to liberalize trade only for 95% of products and to allow exceptions from free trade regime for 5%, essentially for agricultural goods.

The European vector of Ukraine's foreign policy development, structural changes in the Ukrainian economy in the framework of the WTO and its integration into the

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international economic system determine the need for developing new approaches to agricultural market regulation.

This paper is organized as follows. In the first section, material and methods of investigation are introduced. The next section describes an analysis of bilateral trade of agricultural products between Ukraine and the European Union. The following section presents simulation results concerning the Ukrainian agri-food sector development and discusses possible effects of FTA formation on some industries. A summary is the final section.

Material and methods

Research results and conclusions were obtained by using a systematic approach to socio-economic processes using the following methods: the historical and logical method for investigation of the world economy development; methods of comparative analysis and expert evaluations for an analysis of the dynamics of trade in goods and factors that are affecting it; methods of historical analysis and comparison to study and identify stages of export policy; methods of formalization, modelling, methods of correlation-regression analysis, mathematical statistics and predictive extrapolation based on Global Trade Analysis Project (GTAP) for the study of development of foreign economic activity between Ukraine and the European Union.

For analyzing the causal relationships in the world economy, computerized general equilibrium models (Computable General Equilibrium Models) are used. The scenario of Ukrainian agriculture development in terms of FTA creation is build using an extended version of the Global Trade Analysis Project model which is a computable general equilibrium model of the world economy. GTAP model is a multi-regional, multi-sectoral, static, general equilibrium model based on a neo-classical microeconomic theory. The database contains detailed data on bilateral trade, transportation and protection, characterizing economic linkages among regions, and consistent individual country input-output databases which account for intersectoral linkages in 2004.

Determinants of equilibrium that determine the basic structure of the model are the following:

- all markets are in equilibrium (an automatic cleaning of markets from surplus or deficit)
- enterprises work at a break-even point (no economic profit)
- revenues are equal to costs
- production function describes the production technology
- households maximize utility in the process of economic decision making, and enterprises maximize profit.

During the study, the decrees of the Cabinet of Ministers of Ukraine and the President of Ukraine on regulatory issues of foreign economic activity were used. The information and statistics were gathered from different sources: the State Statistics Committee and the State Customs Service of Ukraine, official reports and analytical publications of leading

international economic organizations[2,] monographs and scientific publications of domestic and foreign scientists-economists.

Results

Analysis of Ukraine's trade in agricultural products with the EU countries

Ukraine has considerable agricultural potential due to its vast areas of fertile soil and closeness to key markets in the Middle East, North Africa, the former USSR and, potentially, the EU. Ukraine's food industry, which consumes raw materials produced by the domestic agricultural sector, was a driving force for the economic growth that started in 2000. Since then, the growth has been unsteady which, for the most part, can be attributed to the sector's dependence on grain crops that are known to be largely dependent on weather conditions.

The Ukrainian agricultural products sector has been poorly integrated with the international trade. Taking into consideration Ukraine's agricultural resources, the agrarian policy plays a critical role for the future of sector's development. Ukraine's integration into the WTO and later into a free trade area with the EU is an essential condition for speeding up structural reforms in the country, as well as for its potential to become evident on international markets.
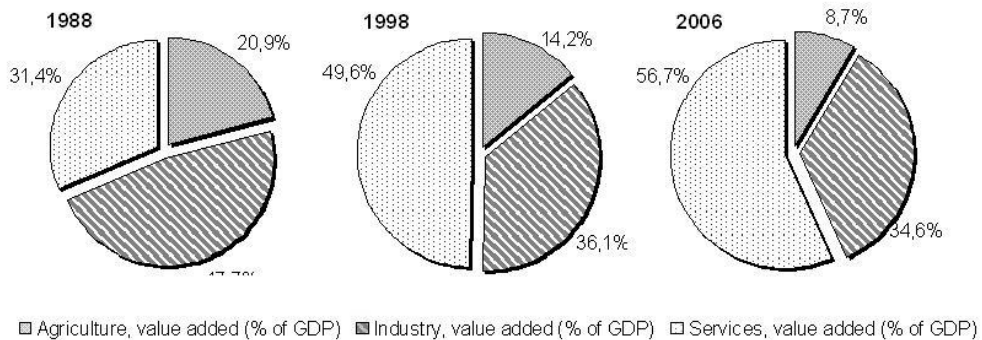
Fig. 1. GDP of Ukraine by sector, %

Source: own construction according to data from the Eurostat and the State Statistics Committee of Ukraine.

Agriculture accounts for about 9% of Ukraine's gross domestic product (GDP) (Figure 1). About 5.7 million people are employed in the agricultural sector, or 19.8% of the professionally active population. The difference between the share of GDP produced in the sector and the share of people employed in it reveals the sector's very low productivity.

In 2008, the share of turnover with the EU in the total Ukrainian trade balance accounted for about 36% (Table. 1). At the same time the share of turnover in agricultural products was only 12%. The main trade products are grains, oil products and foodstuffs. Signing of a Free Trade Agreement (FTA) with the EU will have a significant impact on

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[2] International Monetary Fund, European Commission, World Trade Organization and other.

agriculture as a whole, which through fiscal mechanisms would significantly affect the social sphere.

Table 1. Ukraine's and the EU trade with main partners in 2008

Rank	Ukraine			Rank	European Union		
	partner	million euro	%		partner	million euro	%
1	Eu-27	40 920.5	36.0%	1	United States	435 995.5	15.2%
2	Russia	29 368.9	25.8%	2	China	326 325.0	11.4%
3	China	6 727.6	5.9%	3	Russia	278 770.2	9.7%
4	Turkey	5 407.5	4.8%	4	Switzerland	177 848.3	6.2%
5	Turkmenistan	3 411.2	3.0%	5	Ukraine	39 523.8	1.4%
	World	113 821.0	100.0%		World	2 861 807.6	100.0%

Source: constructed according to International Monetary Fund data.

The last ten years are characterized by a considerable increase in the volume of agricultural products trade with the EU countries and its share in the total turnover. An analysis shows that by 2008 the share of agricultural products in the total exports amounted to about 7.12%, but in the last two years it has grown to 20%, supported by record grain and oilseeds harvests and the trade liberalization after the WTO accession. The average exports growth over the past ten years has been 27%, for imports 23%. Our country exported 1.2 times more agricultural products than imported. However, these positive indicators of foreign trade do not show that Ukraine is ready to form a free trade area with the EU. Grain and oil industries are currently developed and have a strong infrastructure that allows the Ukrainian enterprises to compete with the European companies. But the dairy and meat industries are weak. Old material base and low investments in these sectors have led to increases in dairy and meat products costs while their quality remains low.

Fig. 2. Ukraine's agricultural products[3] trade with the EU-27
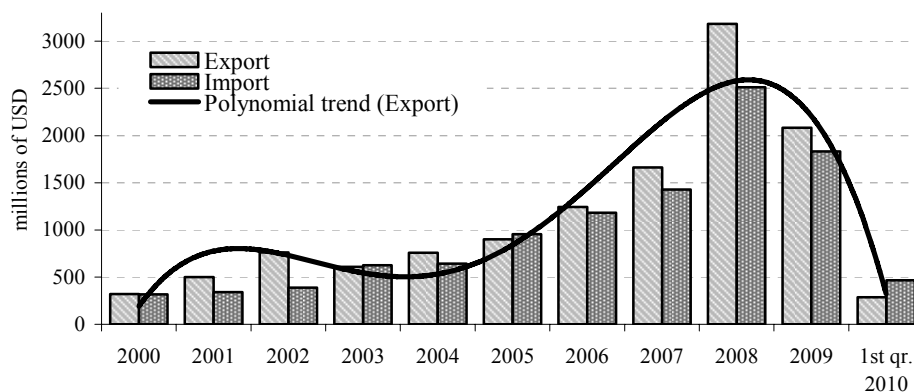
Source: self constructed according to data from the State Statistics Committee of Ukraine.

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[3] Group 1-24 of Ukrainian Commodity Classification for Foreign Economic Activity.

Until 2005, agricultural products imports to Ukraine were, for the most part, limited by high customs tariffs and non-tariff barriers. Over the next 4 years, the trade with the EU countries has significantly increased, and while imports of food and agricultural products to Ukraine in 2008 were only 8.7% of the total imports volume, the growth of imports of these products was 76%.

The main factors behind the rapid growth in imports of these products are a decrease of import tariffs and an increasing demand from Ukrainian consumers as their incomes grow. One of the factors for a decrease in exports of these products is a low competitiveness of Ukrainian goods.

Field crops remain the main goods exported to the EU. Figure 2 demonstrates that in 2008 whole exports of agricultural products to the European countries grew 2 times, generally due to exports of field crops increasing 4.5 times.

It is expected that the same trends will remain in the foreign trade between the EU and Ukraine in the coming years and:

- Ukraine will remain a net exporter of agricultural goods in trade with the EU
- exports of products with high added value (processed products) will decrease and imports will increase
- exports of livestock products will diminish
- cereal and oil will remain the main exported products in the agri-food group.

Major barriers to the Ukraine-EU trade in agricultural products include:

- undeveloped infrastructure (granaries, roads, transport)
- over-regulated and long customs procedures
- an underdeveloped information system concerning the market and poor access to information
- low share in the output of high-quality products (in particular, hard wheat sorts)
- failure to reimburse exporters for VAT
- export/import duties on certain products
- a ban on certain Ukrainian imports to the EU due to the inconsistency between the Ukrainian standards and those of the EU.

Considering current level of agricultural trade between the EU and Ukraine, we can conclude that there is a need to enhance the bilateral trade and investment cooperation and to discuss the possibility of a mutually beneficial invention of ways to increase the trade turnover.

Development of trade relations between Ukraine and the EU in terms of the free trade area creation

According to its political interests the European Union is not ready to offer Ukraine the prospect of membership. However, the EU can not ignore its integration process. FTA is a standard tool for cooperation with third countries.

Offering Ukraine the free trade, the EU allows Ukraine in this way to gain an access to its markets for products, services and capital and to an economic integration. On the other hand, do not forget the economic interests that the EU will defend during negotiations on the FTA. Big agricultural producers in France, Spain and Italy are concerned about the possibility of growing competition from Ukrainian goods, and may require an exception of agricultural products from the FTA.

An estimation of the impact of trade liberalization on output volumes is presented in Table 2. An analysis of data showed that the most susceptible sectors are agriculture and

mining industry. Due to increasing competition, the Ukrainian agricultural enterprises would be forced to reduce production of finished products by 2.9-7.0 per cent.

Table 2: The impact of FTA creation between Ukraine and EU on the production volumes in major industries

Industry	FTA	FTA+[4]
Agriculture	-2.9%	-7.0%
Mining industry	0.2%	-13.5%
Food industry	5.4%	15.9%
Metallurgy	22.8%	37.3%
Textile industry	35.0%	46.9%
Engineering	4.7%	11.5%

Source: self constructed according to the GTAPAgg7 model data.

According to forecasts by the Ministry of Agrarian Policy of Ukraine the annual growth rate of gross agricultural output till 2013 will amount up 3-5% (Fig. 3). However, in terms of FTA these indicators are likely to have a negative value and could drop to -5%, especially in the livestock sector (Fig. 4).
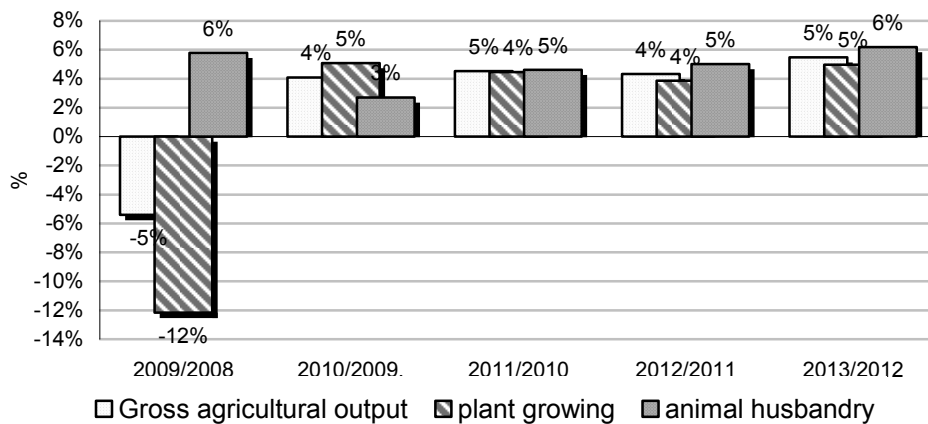
Fig. 3. Dynamics of gross agricultural output till 2013

Source: self constructed according to data from the Ministry of Agrarian Policy of Ukraine.

Typically, the GDP per capita is identified with a welfare indicator. However, in terms of FTA, the difference between welfare and GDP is very significant. This is confirmed by the GTAPAgg7 model. An attempt has been made to estimate how different levels of trade liberalization with the EU will affect not only the welfare change, but also the change in real GDP. As a result it has been found that the GDP will grow three times more slowly than the welfare. So, we can assume that the FTA with the EU will be much more efficient

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[4] FTA+ includes a liberalization of the service sector, regulatory harmonization, reforms of domestic markets and economic institutions.

for Ukraine's economy than the dynamics of real GDP could indicate. In general, the total welfare change resulting from trade liberalization may go up to 8-11%.

Of course, now Ukraine is not ready to fully liberalize its agricultural market for goods from the EU, because it is unknown what consequences of that will be. Despite of the transitional period (3-5 years) to open the Ukrainian market in which business can adapt to new conditions, such sensitive sectors as agriculture and food industry cannot withstand increased competition from the EU. As a result an extinction of companies and reduction of jobs are possible, particularly in the long run.
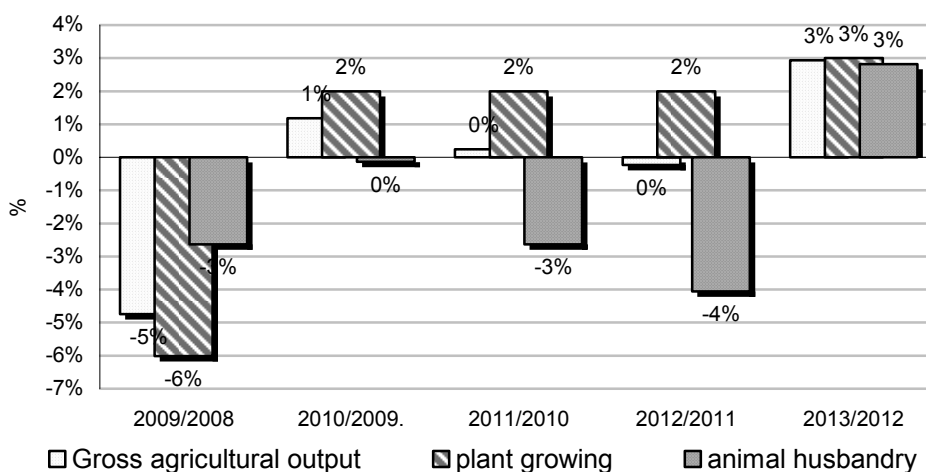
Fig. 4. Dynamics of gross agricultural output till 2013 in terms of FTA formation

Source: self constructed according to the GTAPAgg7 model data.

Analysis of the impact of FTA creation between Ukraine and the EU on different industries; cereals

Nowadays, Ukraine is actively discussing with the EU the possibility of abolition of tariff restrictions. In fact the EU imports only high quality hard and soft wheat at zero tariffs. In 2003, import quotas were imposed for such commodities as barley and low and medium quality soft wheat[5]. Today, the annual wheat quota is 2.378 million tonnes, 572 thousand tonnes of which is of US origin and 388.5 thousand tonnes of Canadian origin. Import duty on grain supply below the quota is 12 euros per tonne, over the quota 95 euros per tonne. As noted before, the cereal grain is the main type of domestic agricultural products exported to the EU. Therefore, any removal of tariff and non-tariff restrictions on imports will significantly increase the competitiveness of Ukrainian grain in the European market.

It should be noted that in July 2009 new standards for the Ukrainian wheat were enacted, which partly solved the problem of inconsistency with the European quality and safety standards.

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[5] Within the quota system (TRQ) the European Commission annually determines the amount of cereal grain imports to the EU countries.

Analysis of the impact of FTA creation between Ukraine and the EU on different industries; livestock

Ukraine is not included in the list of countries that have the right to export live animals and meat to the EU. Imports of fresh meat, meat products, fresh game, livestock, poultry and other live animals from Ukraine to the EU is banned. Ukraine is allowed to export only live horses and donkeys to the EU.

Imports of meat to Ukraine are also limited via high rates of import duties that make legally imported goods uncompetitive in the Ukrainian domestic market. An ad valorem import duty for beef is 15%, for chilled and frozen pork 12% and 10% respectively[6]. But actually the European beef is not imported because of a prohibition to trade with countries that beforehand have reported Bovine Spongiform Encephalopathy (BSE) cases traced. Nevertheless, according to official figures the total imports of meat in 2002-2008 ranged within 85-512 thousand tonnes. Ukraine imports mainly poultry of American, Argentine and Brazilian origin, which is the cheapest kind of soft meat in the world, and which in turn is an important advantage for the sales in the Ukrainian market.

Table 3: Analysis of positive and negative consequences of FTA creation according to stakeholders

Stakeholder	Pros	Cons
Ukrainian producers of grain, meat, milk and dairy products	Expansion of markets Increase in produce quality Increase in productivity Increased access to financial markets, including the foreign ones	Increase in competition in certain markets (milk and meat) Additional expenditure on increase in output, diversification and increase in crop quality
EU agricultural producers of grain, meat, milk and dairy products	Expansion of markets as a result of the rapid growth in Ukrainian incomes	Increase in competition
Ukrainian consumers/ Ukraine's economy as a whole	Increase in market supply Improvement of product quality More efficient use of public funds allocated to agricultural support In the long run, expansion of exports with a high added value	Increase in the price of dairy products if domestic producers' competitiveness decreases Grain crops represent a group of goods with a low value added Increase in grain crops exports will not cause an increase in exports of products with a high added value
Government/ officials	Approval of state decisions/introduction of policies that meet European standards	Need for adoption of a state program for sub-sector development Cutting back opaque state expenditure as requirements for targeted financing get tougher
European consumers/ EU economy	Increase in market supply, decrease in prices in the long run	Increase in the EU budget expenditure for technical assistance to Ukraine

Source: author's compilation based on a study by the International Centre for Policy Studies [Gazizullin 2008].

The main barrier for Ukrainian exports to the EU is a discrepancy in the product quality standards. Only 52% of Ukrainian standards for agricultural products have currently

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[6] According to the Law of Ukraine "On Customs Tariff of Ukraine" of April 5, 2001 # 2371-III with amendments.

been harmonized with the international ones, while the figure for food industry is only 29%.

The poultry farming is so far the only branch able to satisfy market demand, whereas the pork and beef markets are experiencing a scarcity. The poultry stock revival started in 2005, but at the same time according to our forecast the cattle and cow stock will continue to drop until 2012. In the case of signing a free trade agreement, some Ukrainian producers of beef and pork will not be able to withstand fierce competition, and finally may go bankrupt.

Analysis of the impact of FTA creation between Ukraine and the EU on different industries; milk and dairy products

As a result of decrease in the cow population, milk production has grown very slowly recently. In 2008, Ukrainian milk and dairy product exports to the EU dropped by 38.8%.

Development of milk and dairy product exports to the EU is being hindered by:
- a discrepancy between the Ukrainian dairy product quality and the EU standards
- high domestic demand
- high demand for Ukrainian dairy products in the CIS countries, where quality requirements are less stringent.

In trade with the EU, Ukraine is a net exporter of dairy products. However, the country has exported mainly raw materials and imported finished products. Moreover, during the years 2000-2008 the milk and dairy products exports from Ukraine to the EU increased in value terms only 6.8 times, while imports increased 12 times. It is expected that imports of finished dairy products in Ukraine will grow rapidly in the future. The following factors could cause that:
- a stagnation in Ukraine's milk production
- a higher price competitiveness of European products
- a rapid boost in the Ukrainian incomes and in the demand in the high-price segment market (for cheeses in particular).

It is expected that the process of reaching quality standards and related product certification will take quite a while, so dairy product exports from Ukraine will be excluded from the free trade arrangement at the initial stages. The cooperation with the EU at the initial stages will be limited to carrying out EU requirements for relative quality indices. Most likely, customs tariffs for dairy imports at this stage will be preserved at the current level. At later stages, it will be possible for enterprises obtaining corresponding quality certificates to enter the EU market. The EU will require an introduction of zero customs tariffs.

Proposals to overcome the negative effects of FTA

In order to minimize or complete liquidate the negative effects of the FTA formation the Ukrainian government has to:
- avoid the formation of unilateral agreements, which will allow to form an asymmetric FTA and apply a flexible approach to implementation of the acquis communautaire
- reduce the impact of restrictive requirements for products origin on the trade

- focus the working group attention on lowering barriers for access to a high technology products market
- develop a concept of selective trade policy for the entire adaptation period
- determine the order of cooperation with the national producers for the industry standards, norms and rules harmonization
- ensure possible involvement of the EU institutions in Ukrainian reforms
- encourage the participation of NGOs in the EU-funded projects
- review the effectiveness of development programs for small businesses
- stimulate recovery of vocational education, developing a network of centres training and retraining employees.

Summary

An analysis of trade relationships between Ukraine and the EU shows that the most sensitive sectors of the Ukrainian food economy are the dairy and meat industries. Therefore, in case of a FTA formation with the EU it is necessary to temporarily (at least 5 years) leave the tariff and non-tariff trade barriers for the sake of a gradual adaptation of the Ukrainian market to new development conditions. At the same time, grain and oil industries are sufficiently developed, so the domestic producers will be able to withstand increased competition from the European farmers.

The most important ways of the Ukrainian economy integration with the EU are an improvement of the legislative and regulatory system, a rational state support, a harmonization of national standards with the European ones, updating the material base of agricultural and processing enterprises, investments in infrastructure, strengthening the agricultural extension service, training of qualified specialists and others.

Due to the growth of Ukrainian agricultural sector in the FTA conditions, the farmers' income could significantly increase, leading to an improvement of country's macroeconomic indicators, increasing productivity and welfare of the rural population.

The essentiality of estimated indices of the FTA impact on the Ukrainian agricultural development is very low because of a need for a large number of assumptions in the integration model. In particular, there is a need to forecast the economic performance of countries at the time the FTA enters into force and to assess the possible conditions of the agreement.

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Competitiveness of chief producers of plant raw materials in intra-EU trade

Abstract. The aim of the paper was to assess the competitive position of the most important producers of plant raw materials in the intra-EU trade in 2004 and 2008. The analysis covered such product groups as cereals, oil seeds, fruit and vegetable. The competitiveness was assessed with the use of a selected set of quantitative measures of international competitive position. Moreover, the shares of the studied countries in the EU trade were assessed as well as the relative intensity of plant raw materials export from each country.

Key words: competitiveness, comparative advantages, plant raw materials, export, import, the European Union, intra-EU trade

Introduction

Poland is one of the biggest producers of plant raw materials in the EU. It produced in 2008 about 27.7 million ton of cereals and 2.1 million tons of oil seeds respectively, which gave it a position of the third largest producer among the 27 countries of the Community. On the other hand, the crops of 2.8 million ton of fruit and 4.4 million ton of vegetable gave Poland the fourth place with respect to the volume of horticultural production [Eurostat… 2010]. It is worth noting that only the countries whose location and climatic conditions enable the production of citrus fruit and thermophilic vegetable (Italy, France, Spain) produced considerably more fruit and vegetable than Poland. In comparison with the countries of similar climate, e.g. Germany, the United Kingdom or the Netherlands, the volume of Polish horticultural production, especially fruit, is higher.

It must be stressed that 65% of the exports and 70% of the imports of unprocessed plant products from/to Poland was a part of the intra-EU trade. The establishment of a free trade zone and Polish inclusion in the Single European Market increased the openness of the exchange and the Polish agri-food sector began to face strong competitive pressure exerted both by other member states of the Community and the third countries. Thus the fundamental and necessary condition for Polish agricultural and processed food producers to compete effectively in the Single European Market is to meet all requirements of the highly competitive EU market. In this context and also considering the diversified structure of production in the countries of Central and Southern Europe, it is interesting to diagnose the competitiveness of those branches of the Polish agri-food sector which produce plant raw materials with regard to the other important producers of unprocessed plant products in the EU. Hence, the aim of this article is to determine the competitive position of the most important producers of plant raw materials in the intra-EU trade in 2004 and 2008.

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Research method

Data from the Statistical Office of the European Communities, especially from the ComExt database [ComExt… 2010], were used in the paper. The analysis covered the key groups of plant raw materials according to the Combined Nomenclature, i.e. cereals, oil seeds, fruit and vegetable. The objects of the study were the five largest producers (by production volume) of each of the listed groups of unprocessed plant products in the EU, i.e. France, Spain, the Netherlands, Germany, Poland, Portugal, Romania, Hungary, the United Kingdom and Italy.

The competitiveness was assessed by using a selected set of quantitative measures of international competitive position. The following indices were applied: Export Specialisation Index (SI), Import-Export Coverage Ratio (CR), revealed comparative advantage indices including Relative Revealed Comparative Export Advantage Index (XRCA), Relative Import Penetration Index (MRCA), Relative Trade Advantage Index (RTA) and Grubel-Lloyd Intra-Industry Trade Index (IIT)[2]. Moreover, the shares of the studied countries in the EU trade were assessed as well as the relative intensity of export of plant raw materials from each country measured as the exports value per 1 hectare of agricultural areaor per one full-time employee in the agricultural sector in reference to the EU average.

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[2] The Export Specialisation Index (SI) compares the share of product i in the l country's exports with the share of

the product in the world or regional exports: $SI_k = \dfrac{X_{ik}}{X_k} : \dfrac{X_{iw}}{X_w}$, where: X – exports, w – index denoting world.

High SI values are considered desirable. Otherwise, it is possible to conclude that the economy in question or its sector do not have satisfactory competitiveness [Jagiełło 2003].

Similarly to the SI, the Export-Import Coverage Ratio (CR): $CR_k = \dfrac{X_k}{M_k} \cdot 100\%$ where: M – imports, enables a

calculation of export specialisation of a given country within the analysed sector, product or group of products. The coefficient values exceeding 100% specify the specialisation of the analysed country, which gives a possibility to claim that it has a relative advantage over partners [Lubiński, Michalski & Misala 1995].
The indexes of revealed comparative advantages were calculated on the basis of the following formulae:

$$XRCA_{ik} = \frac{X_{ik}}{X_{im}} : \frac{\sum\limits_{j, j \neq i} X_{jk}}{\sum\limits_{j, j \neq i} X_{jm}}, \quad MRCA_{ik} = \frac{M_{ik}}{M_{im}} : \frac{\sum\limits_{j, j \neq i} M_{jk}}{\sum\limits_{j, j \neq i} M_{jm}}, \quad RTA_{ik} = XRCA_{ik} - MRCA_{ik}, \text{ where: X – exports;}$$

M – imports; i, j – product groups; l, m – countries, and then they were generally evaluated with the use of relations between them. Positive RTA index values and XRCA index values larger than unity show high competitiveness (+), but when the RTA index is negative and the MRCA index is larger than unity, the country shows no competitiveness (-). In other cases the results of analysis are not definite (+/-) [Frohberg & Hartmann 1997].

Grubel-Lloyd Index (IIT) [Cieślik 2000]: $IIT_k = \dfrac{\left(X_{ik} + M_{ik}\right) - \left|X_{ik} - M_{ik}\right|}{\left(X_{ik} + M_{ik}\right)} \cdot 100\%$, where: k – index

denoting country, was applied to specify the importance of intra-industry trade. High values of the index, which are close to 100%, show the presence of intra-industry exchange, i.e. the exchange with a high degree of overlapping streams of export and import of products from the same branch. However, the IIT index assuming the value close to zero indicates the presence of inter-industry trade. For more information about the methods of international competitiveness measurement see [Pawlak & Poczta 2008].

The competitive situation in the intra-EU trade in plant raw materials

As it results from the study, from 2004 to 2008 oil seeds were the most competitive group of plant raw materials in the intra-EU trade (Table 1). The analysis of revealed comparative advantages proved that the new member states of the EU, such as Romania and Hungary, were characterised by the strongest competitive position in this assortment group (in 2008 RTA = 9.9 for Romania and RTA = 3.1 for Hungary). The highest level of realised export specialisation, measured with the value of SI index, was observed in those countries. The share of oil seeds in the total agri-food exports was from nearly 4 to almost 9 times higher in those countries than in the other countries of the Community. However, it must be noted that the share of those countries in the total trade in the EU was small and fluctuated around 6% for export and only 1% for import (Table 2). Besides, the analysis of a relative export intensity proved that although the value of oil seeds exports per 1 hectare of agricultural areaand 1 full-time employee working in agriculture in Hungary was higher than the average in the EU countries by about 80% and 4 times respectively, in Romania it reached the level of slightly more than 70% and nearly 25% of the corresponding average values for the EU (Table 3).

Table 1. Competitiveness of chief producers of oil seeds in the intra-EU trade in 2004-2008

Index	Year	Country				
		France	Poland	Romania	Hungary	United Kingdom
SI	2004	1.25	1.07	6.77	3.74	0.36
	2008	1.25	0.69	8.87	3.53	0.49
CR, %	2004	180.39	93.47	142.50	375.37	19.95
	2008	165.51	55.34	232.09	420.59	26.76
XRCA	2004	1.26	1.07	7.66	3.96	0.35
	2008	1.26	0.69	11.04	3.77	0.48
MRCA	2004	0.47	0.75	0.90	0.85	0.45
	2008	0.53	0.82	1.11	0.72	0.44
RTA	2004	0.78	0.32	6.76	3.11	-0.10
	2008	0.73	-0.13	9.93	3.05	0.04
General evaluation	2004	+	+	+	+	+/-
	2008	+	+/-	+	+	+/-
IIT, %	2004	71.33	96.63	82.48	42.07	33.27
	2008	75.33	71.25	60.22	38.42	42.22

Source: [ComExt… 2010] and own calculations.

On the other hand, France, which generated smaller comparative advantages in the intra-EU trade (RTA = 0.7 both in 2004 and 2008) and realised a lower level of export specialisation (SI = 1.3), was an active participant of the Single European Market. It marketed nearly 20% of the total EU exports of this group of products (Table 2) and generated the exports value per one full-time employee working in the agricultural sector about 2.5 times higher than in the other EU countries (Table 3). In all of the three countries mentioned above, a favourable competitive situation was proved by a surplus in the balance of trade. The highest values were noted in Hungary (CR=375% in 2004 and CR=421% in

2008) (Table 1). Poland and the United Kingdom were characterised by an average level of comparative advantages in the intra-EU trade in oil seeds, but between 2004 and 2008 the competitive position of Poland became worse, whereas the position of the United Kingdom became slightly better.

Table 2. Foreign trade by chief producers of plant raw materials and its role in the European Union trade in 2004-2008

Country	Exports, year				Imports, year			
	2004		2008		2004		2008	
	million euro	%	million euro	%	million euro	%	million euro	%
Cereals								
France	3 993.0	48.7	6 523.5	38.1	478.5	5.2	781.0	4.5
Spain	308.1	3.8	497.0	2.9	1 345.5	14.6	2 565.2	14.8
Germany	1 159.5	14.1	2 568.5	15.0	803.4	8.7	2 071.8	11.9
Poland	36.6	0.4	126.9	0.7	181.9	2.0	566.9	3.3
United Kingdom	455.6	5.6	684.6	4.0	634.9	6.9	1 135.6	6.5
EU-27	8 205.2	100.0	17 121.6	100.0	9 198.4	100.0	17 364.2	100.0
Oil seeds								
France	959.3	19.2	1 524.7	17.8	531.8	5.7	921.2	6.0
Poland	112.1	2.2	196.7	2.3	119.9	1.3	355.5	2.3
Romania	78.8	1.6	467.9	5.5	55.3	0.6	201.6	1.3
Hungary	230.1	4.6	500.5	5.8	61.3	0.7	119.0	0.8
United Kingdom	113.5	2.3	215.2	2.5	568.8	6.1	804.2	5.2
EU-27	4 996.5	100.0	8 562.1	100.0	9 379.4	100.0	15 418.2	100.0
Fruit								
France	1 410.0	9.8	1 473.0	7.4	2 844.1	12.4	3 375.6	11.1
Spain	4 277.0	29.6	5 105.5	25.8	1 208.7	5.2	1 536.1	5.1
Poland	439.2	3.0	705.3	3.6	564.1	2.4	1 032.0	3.4
Portugal	112.2	0.8	187.9	0.9	380.3	1.7	486.5	1.6
Italy	2 011.4	13.9	2 933.4	14.8	1 717.2	7.5	1 958.6	6.4
EU-27	14 430.9	100.0	19 804.7	100.0	23 026.2	100.0	30 398.4	100.0
Vegetables								
France	1 411.2	10.7	1 696.3	10.0	1 815.4	12.5	2 246.6	12.1
Spain	3 348.7	25.4	3 797.9	22.5	833.4	5.7	916.3	4.9
Netherlands	3 994.0	30.3	5 267.1	31.1	1 466.6	10.1	1 831.5	9.8
Poland	431.9	3.3	745.4	4.4	158.4	1.1	413.3	2.2
Romania	39.2	0.3	41.7	0.2	41.0	0.3	155.1	0.8
EU-27	13 174.0	100.0	16 911.8	100.0	14 546.6	100.0	18 624.0	100.0

Source: [ComExt… 2010] and own calculations.

It is worth noting that the oil seeds trade had an intra-industry character, which was strongest in Poland and Romania (60%<IIT<97%). The high extent of overlapping streams of exports and imports in this commodity group can be justified by a complementary character of production structures and, in consequence, trade between the abovementioned countries and the countries being their trade partners. In Poland and Romania it is almost but the oilseed rape that is grown on a large scale, whereas the demand for other seeds is traditionally satisfied by the supply from imports.

Fruit and vegetable producers were characterised by a lower level of competitiveness in the Single European Market in comparison with oil seeds producers (Tables 4 and 5). Spain gained the highest profit from the intra-EU trade in horticultural products; it was the second producer and the first exporter of those products among the EU countries. Spain produced 11.2 million ton of fruit in 2008 and 8.9 million ton of vegetable [Eurostat… 2010] and about 25-30% of the total exports in those assortment groups in the EU came from that country (Table 2). Spain's strong competitive position was proved both by the results of summary evaluation of the indices of revealed comparative advantages (XRCA>3 and 2<RTA<3) and the value of the generated turnover surplus (Tables 4 and 5). The income from vegetable exported from Spain exceeded the import expenses for the same commodity group by 4 times (CR=402% in 2004 and CR=414% in 2008) and the value of fruit exports was more than 3 times higher than the corresponding imports value (CR=402% in 2004 and CR=414% in 2008). Also, Spain realised the highest degree of export specialisation among the analysed countries (2.8<SI<3.4), but simultaneously, due to the diversified structure of its own production it had the least intense intra-industry trade (on average IIT=39% for vegetables and IIT=45% for fruit). It is necessary to add that the value of exports of horticultural products per 1 hectare of agricultural areain Spain was nearly 2 times higher than the average value in the EU. As far as the number of full-time employees working in agriculture is concerned, the value of exports from that country exceeded the average value in the other countries of the Community by 2.5 to 3.5 times (Table 3).

The Netherlands and Poland were characterised by a similar level of comparative advantages (XRCA, MRCA, RTA), degree of export specialisation (SI) and surplus in the balance of trade (CR) in vegetable turnover (Table 4). However, the share of the Netherlands in the EU trade in this group of products was about 10 times higher than the share of Poland (Table 2), whereas the intensity of exports per 1 hectare of agricultural areaand per one full-time employee in 2008 was respectively nearly 60 and 70 times higher than in Poland and about 25 times and 30 times higher than in the EU (Table 3)[3]. Romania and France were distinguished by the weakest competitive position and turnover deficit (Tables 2 and 4). Romania was additionally marked by its marginal role in the intra-EU vegetable trade[4]. The surplus of import expenses over the income from exports of vegetable in those countries can be explained by a very high share of intra-industry trade in the total turnover (e.g. in 2004 in France IIT=87% and in Romania IIT=98%).

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[3] However, it must be stressed that the high values of indices of relative export intensity for the Netherlands are largely determined by a considerable re-exportation which results from the profile of Dutch agriculture. It is geared towards the greenhouse growing of vegetable and flowers, production of flower bulbs and plant nursery production [Rowiński 2009].
[4] In 2004 and 2008, the Romania's share in the total EU exports of vegetable did not exceed 0.5% and in the imports it did not exceed 1% (Table 2). However, the exports value per 1 hectare of agricultural areawas about 3% of the EU average and the value per one full-time employee working in agriculture reached only 1% (Table 3).

Table 3. Relative intensity of exports (I – as the exports value per 1 hectare of UAA, II – as the exports value per one full-time employee) of plant raw materials in the studied countries in 2004 and 2008

Country	Relative intensity of exports I, year (EU=100)		Relative intensity of exports II, year (EU=100)	
	2004	2008	2004	2008
Cereals				
France	2.67	2.32	4.87	5.71
Spain	0.24	0.20	0.37	0.39
Germany	1.35	1.58	1.63	2.03
Poland	0.04	0.08	0.02	0.04
United Kingdom	0.53	0.47	1.51	1.14
EU-27	1.00	1.00	1.00	1.00
Oil seeds				
France	1.05	1.08	1.92	2.67
Poland	0.22	0.26	0.09	0.12
Romania	0.18	0.71	0.05	0.24
Hungary	1.28	1.81	2.17	4.00
United Kingdom	0.22	0.29	0.62	0.72
EU-27	1.00	1.00	1.00	1.00
Fruit				
France	0.54	0.45	0.98	1.11
Spain	1.91	1.80	2.92	3.47
Poland	0.30	0.41	0.12	0.19
Portugal	0.33	0.45	0.12	0.19
Italy	1.72	1.99	1.43	1.96
EU-27	1.00	1.00	1.00	1.00
Vegetable				
France	0.59	0.61	1.07	1.50
Spain	1.63	1.57	2.51	3.03
Netherlands	25.55	28.81	11.43	16.40
Poland	0.33	0.50	0.13	0.24
Romania	0.03	0.03	0.01	0.01
EU-27	1.00	1.00	1.00	1.00

Source: [ComExt… 2010; Agriculture… 2006; Agriculture… 2010] and own calculations.

Besides Spain, Italy also reached a significant comparative competitiveness in the fruit trade in the Single European Market (Table 5). It produced in 2008 nearly 21 million ton of fruit [Eurostat… 2010], supplied nearly 15% of exports in this group of products in the EU (Table 2) and it reached about 2 times higher exports intensity than its average in the EU (Table 3). However, Italy's indices of export specialisation (SI), import/export coverage ratio (CR) and relative trade advantage (RTA) were about 2 times lower than for Spain (Table 5). On the other hand, the scale of intra-industry trade in that country was much

larger. In 2004 the Grubel-Lloyd Index (IIT) fluctuated around 90% and in 2008 it was lower by 10 percentage points.

Table 4. Competitiveness of chief producers of vegetable in the intra-EU trade in 2004 and 2008

Index	Year	Country				
		France	Spain	the Netherlands	Poland	Romania
SI	2004	0.70	2.91	1.54	1.56	1.28
	2008	0.71	2.77	1.66	1.33	0.40
CR (%)	2004	77.73	401.81	272.33	272.59	95.61
	2008	75.51	414.48	287.58	180.33	26.89
XRCA	2004	0.69	3.25	1.59	1.61	1.30
	2008	0.70	3.04	1.71	1.35	0.39
MRCA	2004	1.07	0.73	0.93	0.63	0.42
	2008	1.10	0.66	0.86	0.79	0.69
RTA	2004	-0.38	2.52	0.67	0.98	0.88
	2008	-0.41	2.39	0.86	0.56	-0.31
General evaluation	2004	-	+	+	+	+
	2008	-	+	+	+	+/-
IIT (%)	2004	87.47	39.86	53.72	53.68	97.76
	2008	86.04	38.87	51.60	71.34	42.38

Source: [ComExt… 2010] and own calculations.

Of the southern countries, the least importance and average competitive advantages in the intra-Community fruit trade were noticed for Portugal. France, which generated 7-10% of the export supply and more than 10% of the demand for imported products, was void of those advantages (Tables 2 and 5). In both countries a turnover deficit was noted (CR<100%) and they did not achieve an export specialisation in this commodity group. The share of revenue from the exports of fruit in the total revenue from exports of agri-food products in Portugal was lower by about 15% (SI=0.87 in 2004 and SI=0.83 in 2008), whereas in France it was as much as 50% lower (SI=0.52 in 2008) than in the other EU countries. In view of the analysis, Poland was marked by a slightly better competitive position than France, but still it could be evaluated as low. It is worth noting that in Poland and Romania in the post-accession period lower comparative advantages appeared in the trade in horticultural products in the Single European Market. After 2004 in consequence of the introduction of rules of Common Agricultural Policy (CAP) in the new member states, the prices of fruit and vegetable increased and the relative price change caused the weakening of competitive position of horticultural products from those countries [Pawlak et al. 2010], which resulted in decreasing values of SI, CR, XRCA and RTA indices.

In cereal trade, only France achieved a high level of competitive advantages in the Single European Market. It was the chief cereal producer (70 million ton in 2008) and exporter among the EU countries [Eurostat… 2010]. The share of France in the total exports of cereals from the EU was nearly 50% in 2004 and 40% in 2008 (Table 2), which was also reflected by the values of export specialisation index, indicating that the revenues gained in the exports of cereal grains in France were more than one tenth of the total EU

agri-food exports value. This share was about 3 times higher than in the other member states of the Community (SI=3.2 in 2004 and SI=2.7 in 2008) (Table 6).

Table 5. Competitiveness of chief fruit producers in the intra-EU trade in 2004 and 2008

Index	Year	Country				
		France	Spain	Poland	Portugal	Italy
SI	2004	0.64	3.39	1.45	0.87	1.77
	2008	0.52	3.18	1.07	0.83	1.94
CR (%)	2004	49.58	353.85	77.87	29.50	117.13
	2008	43.64	332.37	68.35	38.62	149.77
XRCA	2004	0.62	3.97	1.49	0.86	1.86
	2008	0.51	3.66	1.08	0.82	2.06
MRCA	2004	1.06	0.66	1.51	0.77	0.69
	2008	1.01	0.67	1.24	0.72	0.67
RTA	2004	-0.44	3.31	-0.02	0.09	1.17
	2008	-0.50	2.99	-0.17	0.10	1.38
General evaluation	2004	-	+	-	+/-	+
	2008	-	+	-	+/-	+
IIT (%)	2004	66.29	44.07	87.56	45.56	92.11
	2008	60.76	46.26	81.20	55.72	80.07

Source: [ComExt… 2010] and own calculations.

Table 6. Competitiveness of chief cereals producers in the intra-EU trade in 2004 and 2008

Index	Year	Country				
		France	Spain	Germany	Poland	United Kingdom
SI	2004	3.17	0.43	1.05	0.21	0.87
	2008	2.69	0.36	0.99	0.22	0.77
CR (%)	2004	834.48	22.90	144.32	20.14	71.76
	2008	835.28	19.37	123.97	22.39	60.29
XRCA	2004	3.41	0.42	1.05	0.21	0.86
	2008	2.94	0.35	0.99	0.21	0.76
MRCA	2004	0.43	1.96	0.50	1.17	0.51
	2008	0.40	2.11	0.67	1.18	0.56
RTA	2004	2.98	-1.54	0.56	-0.97	0.36
	2008	2.54	-1.76	0.32	-0.97	0.21
General evaluation	2004	+	-	+	-	+/-
	2008	+	-	+/-	-	+/-
IIT (%)	2004	21.40	37.26	81.86	33.53	83.56
	2008	21.38	32.46	89.30	36.59	75.22

Source: [ComExt… 2010] and own calculations.

The intensity of exports measured by its value per 1 hectare of agricultural area was more than 2 times higher than in the EU the value per 1 full-time employee even more than

5 times higher (Table 3). France's favourable competitive position in cereal trade was also confirmed by the result of balance of trade, which showed that the exports were 8 times higher than the imports of that group of products (CR=835%) (Table 6). It is necessary to note that in contrast to the other countries subjected to this analysis, France had a clearly inter-industry trade in cereal grains (IIT=21%), determined by the highest level of food self-sufficiency in cereals of all the EU countries (186% in the economic year 2007/2008) [Agriculture... 2010]. Spain and Poland were characterised by a higher (but under 40%) intensity of intra-industry trade (IIT), an absence of revealed comparative advantages (MRCA>1 and RTA<0) and export specialisation (SI) and a turnover deficit (CR) (Table 6). Poland was also distinguished by the lowest relative export intensity of all of the analysed countries (Table 3). Because of a relatively low volume of cereal grain imports to Poland (Table 2) it is possible to think that the high production potential (28 million ton in 2008) causes the cereal imports to be only a supplement to the domestic production in the years of poor harvest or, that due to climatic limitations, it is inevitable (durum wheat) [Pawlak 2009]. The highest share of intra-industry trade in the total turnover of cereals (75%<IIT<89%) with a simultaneous average level of competitive advantages was noted in Germany and the United Kingdom (Table 6).

Concluding remarks

On the basis of the conducted analyses it is possible to conclude that among all of the studied groups of products the oil seeds were marked by the highest competitive advantages in the intra-EU trade. Hungary gained the strongest competitive position in the trade in this group of products, in cereal trade it was France and in the turnover of horticultural products Spain achieved the highest comparative surplus. All of those countries had constant advantages resulting from the scale of production and/or natural conditions (nature and climate rent) affecting the profitability of production of plant raw materials. Apart from cereals, Poland was characterised by a relatively strong competitive position in the Single European Market. However, it is necessary to pay attention to its minor significance in the structure of total agri-food trade in the EU and its low export intensity, usually reaching at most 30-40% of the average value for all the countries of the Community.

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Spatial differences in the level of absorption of Common Agricultural Policy funds by agricultural holdings in Poland over the years 2004-2006

Abstract. The article offers a territorial analysis of funds acquired by Polish agricultural holdings in the years 2004-2006 via direct payments and through participation in measures of the Rural Development Programme and the Sectoral Operational Programme 'Restructuring and Modernisation of the Food Sector and Rural Development'. The analysis was based on the data on subsidies obtained in individual spatial units (voivodeship, poviat) as expressed by two indices: PLN per farm and PLN per hectare of agricultural land. It was found that owing to the structure of payments with a predominance of area payments, those areas were preferred that had a favourable farm-size structure and a high, historically developed level of farming. Such an allocation of the EU subsidies had contributed very little to the levelling out of structural differences in Polish farming.

Key words: Common Agricultural Policy, agricultural holdings, absorption of EU funds

Introductory remarks

Poland's membership of the European Union and the resulting eligibility of Polish agricultural holdings for a wide array of Common Agricultural Policy (CAP) instruments offer them good prospects of modernisation. This issue is especially significant because Poland shows wide spatial differences in farming, mainly owing to its natural, historical and urbanisation determinants [Bański 2007; Głębocki & Rudnicki 2008]. It is therefore important both in cognitive and application terms to enquire if the Community means obtained so far have helped to level out the structural differences, or on the contrary, if they have tended to aggravate the polarisation of spatial agricultural structure in Poland. The present article seeks an answer to this question with reference to the CAP programmes implemented by the Agency for Restructuring and Modernisation of Agriculture (AR&MA) in the first period of Poland's EU membership (2004-2006). The analysis concerned two operational programmes launched by the Ministry of Agriculture and Rural Development and the European Agricultural Guidance and Guarantee Fund (EAGGF), viz. the Rural Development Programme (RDP) and the Sectoral Operational Programme 'Restructuring and Modernisation of the Food Sector and Rural Development' (SOP_Agri for short). Defined in PLN, the level of absorption of the EU funds was analysed per hectare of agricultural land (AL) and per farm (the number and area of farms according to an AR&MA list of agricultural producers). Those indices provided a basis for a

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spatial analysis, both by regions and by the Agency's 314 poviat offices [Rudnicki 2009, pp. 6-10].

Absorption level

As a result of Poland's accession to the EU and of the Common Agricultural Policy implementation, 35.6 billion PLN were transferred over the years 2004-2006 to nearly 1.5 million farms listed in the AR&MA register of agricultural producers. Such a large sum of payments, exempt from the income tax, justifies a statement that in that period the EU funds were the chief development factor in Polish agriculture.

Predominant in the structure of the funds obtained were the direct payments to producers (59.7%) with the aim of helping to support their incomes without a need to raise prices of their produce for consumers. Their amount was proportional to the area of agricultural land irrespective of the kind of farming activity pursued. In accordance with the Direct Payment to Farmland Act of 18 December 2003, the direct payment scheme embraced land kept in good agricultural and environmental condition, and consisted of two elements: a single area payment (SAP) and complementary national direct payments (CNDP) [Kisiel, Babuchowska & Marks-Bielska, 2008].

In the years 2004-2006, agricultural holdings received a total of 9,393.7 million PLN (27.8% of EU means) under the single payment scheme. The payment rate established in relation to the 'old' EU states on the basis of the euro exchange rate and negotiated under the Accession Agreement (55% in 2004, 60% in 2005, 65% in 2006) kept growing from 210.53 PLN/hectare in 2004 to 225.00 PLN/hectare in 2005 and 276.28 PLN/hectare in 2006. This boosted the amount of payments flowing to Polish agriculture under this head from 2,853 million PLN (2004) to 3,160 million (2005) and 3,880 million (2006).

In the first period of Poland's EU membership, the financial support for agricultural holdings (greater than SAP) involved complementary national direct payments of 11,340.5 million PLN (31.9% of the total). They embraced four categories of crops:

- so-called 'other crops': 10,930.8 million PLN was granted (rates in PLN per hectare AL: 297.78 PLN in 2004, 282.35 PLN in 2005 and 313.45 PLN in 2006); the list of those crops was published each year in a Council of Ministers' ordinance concerning crops eligible for complementary payments; in the study period those payments could be claimed for the following types of crop: cereals and their hybrids, oilseeds (rape and its cultivars, sunflowers), protein crops (broad beans, broad bean cultivars, sweet lupins, peas), leguminous (vetches, lentils, chick-peas), nuts (walnuts, hazel nuts), fibre flax and linseed, fibre hemp, crops grown for seed (grains, oilseeds, fibre crops, grasses and legumes), crops grown for fodder on meadows, pastures and arable land (grasses, leguminous, forage legumes, mixtures of grasses and leguminous, and forage root crops except fodder potatoes) [Instrukcja ... 2004, 2005, 2006];
- hop: the amount of assistance per hectare of plantation was established at 1,013.81 PLN in 2004, 870.02 PLN in 2005, and 962.75 PLN in 2006, which gave a total of 6.4 million PLN granted to agricultural holdings;
- energy crops: the amount of assistance per hectare of plantation of energy willow and the thornless cultivar of dog rose was set at 54.46 euro in 2005 and 70 euro in 2006,

which gave a total of 2.5 million PLN granted (this figure only concerns years 2005-2006; after 2006 the list of eligible energy crops was greatly expanded);

- sugar payment: the amount of assistance was set at 33.94 PLN per tonne of material; as a result, 61.2 thousand sugar beet growers in Poland obtained 400.8 million PLN (this support was first launched in 2006 [Sprawozdanie;... 2004; 2005; 2006].

In the years 2004-2006, apart from area payments, agricultural holdings could apply for funds under two operational programmes: the Rural Development Programme (RDP) and the Sectoral Operational Programme 'Restructuring and Modernisation of the Food Sector and Rural Development' (SOP_Agri).

Table 1. Level and structure of absorption of the EU funds by agricultural holdings in Poland in the years 2004-2006.

Programme	Measures	Assistance	
		million PLN	%
Direct payments	SAP - single area payment	9,893.7	27.8
Direct payments	CNDP - complementary national direct payments	11,340.5	31.9
	Direct payments total	21,234.2	59.7
RDP	1. Structural pensions	2,083.8	5.9
RDP	2. Support for semi-subsistence farms undergoing restructuring	1,316.3	3.7
RDP	3. Support for agricultural activity in less-favoured areas (LFA)	3,702.6	10.4
RDP	4. Support for agri-environmental ventures and improvement of animal wellbeing	814.9	2.3
RDP	5. Afforestation of farmland	384.5	1.1
RDP	6. Adjustment of farms to the EU standards	2,437.5	6.8
	RDP total	10,739.6	30.2
SOP_Agri	A. Investment on farms (AR&MA)	2,441.9	6.9
SOP_Agri	B. Setting-up of young farmers (AR&MA)	708.9	2.0
SOP_Agri	C. Diversification of agricultural and agriculture-related activity to ensure a diversity of ventures or alternative sources of income (AR&MA)	284.6	0.8
SOP_Agri	D. Development and improvement of agriculture-related technical infrastructure (AR&MA)	149.5	0.4
	SOP_Agri total	3,584.9	10.1
	EU programmes and measures, 2004-2006 total	35,558.7	100

Source: own compilation on the basis of data from the AR&MA System of Managerial Information.

Under the RDP, 10,739.6 million PLN were transferred to agricultural holdings, which accounted for 30.2% of the total amount granted over the years 2004-2006. Launched within the programme were six measures [Plan ... 2004]:

- structural pensions: 2,083.8 million PLN were granted, or 5.9% of the total sum (the measure, addressed to farmers of pre-retirement age, was intended to accelerate the process of generational exchange among farm operators and improve the farm-size structure);
- support for semi-subsistence farms undergoing restructuring: 1,316.3 million PLN

was granted, or 3.7% of the total sum (the measure ensured financial assistance necessary to help preserve the financial liquidity of farms with a production scale of up to 4 ESU);

- support for agricultural activity in less-favoured areas (LFA): 3,702.6 million PLN were granted, or 10.4% of the total sum (the measure ensured financial assistance to holdings situated in unfavourable natural conditions; it was intended to counteract depopulation of rural areas and loss of their agricultural character, and to promote environment-friendly farming);
- support for agri-environmental ventures and improvement of animal wellbeing: 814.9 million PLN were granted, or 2.3% of the total sum (the measure was intended to encourage farmers to undertake steps to protect the environment; it was available in the form of seven packages embracing the entire country or selected priority zones);
- afforestation of farmland: 384.5 million PLN were granted, or 1.1% of the total sum (the aim was to afforest agricultural land of low farming quality);
- adjustment of farms to EU standards: 2,437.5 million PLN were granted, or 6.8% of the total sum (the aim was to adjust farms to Community standards in such fields like environmental protection, hygiene, animal wellbeing and food safety (Table 1).

The SOP_Agri programme transferred the smallest assistance out of the Community funds (3,584.9 million PLN, or 10.1% of the total). The sums obtained by agricultural holdings were granted under four operational measures [Sektorowy ... 2004]:

- investment on farms: 2,441.9 million PLN were granted, or 6.9% of the total sum (the measure was intended to support projects of farm modernisation);
- setting-up of young farmers: 708.9 million PLN were granted, or 2.0% of the total sum (the target group of financial assistance were young farmers, up to 40 years of age, who started running a farm on their own);
- diversification of agricultural and agriculture-related activities to ensure a diversity of ventures or alternative sources of income: 284.6 million PLN were granted, or 0.8% of the total sum (the aim of the measure was to support investment projects designed to start an additional economic activity in farms, e.g. agro-tourism, or services for agriculture and small-scale processing of agricultural products);
- development and improvement of farming-related technical infrastructure: 149.5 million PLN were granted, or 0.4% of the total sum (the measure was intended to improve the equipment of farms with modern infrastructure, especially of the kind important from an environmental point of view, e.g. water-and-sewage facilities (Table 1).

Under the above measures over the years 2004-2006, agricultural holdings in Poland obtained 35,558.7 million PLN. However, the level of absorption of the Community funds showed wide spatial differences, both by voivodeship (from 859 million PLN in Lubuska Land and 776 million in Silesia to 4,583 million in Wielkopolska and 5,168 million in Mazovia) and by AR&MA poviat office (from under 10 million PLN in Chrzanów poviat in Małopolska with 5.5 million and Skarżysko-Kamienna in Świętokrzyska Land with 9.9 million, to more than 300 million PLN: Poznań poviat in Wielkopolska with 319 million, Białystok poviat in Podlasie with 342 million, Ostrołęka poviat in Mazovia with 386 million, and the top-ranking Biała Podlaska poviat in Lublin voivodeship with 423 million). Another indicator of big territorial differences in the absorption level is also the fact that close to 60% of the total funds granted

went to six (out of 16) voivodeships: Łódź (7.3%), Kujavia-Pomerania (7.9%), Podlasie (8.1%), Lublin (9.1%), Wielkopolska (12.9%) and Mazovia (14.5%) (Table 2).

Table 2. Indices of the level of absorption of the CAP funds by agricultural holdings in Poland in years 2004-2006.

Voivodeship	CAP funds		Absorption, thousand PLN per farm	Absorption, thousand PLN per hectare of agricultural land
	million PLN	%		
Lower Silesia	1,872.5	5.3	30.1	2.2
Kujavia-Pomerania	2,802.1	7.9	40.2	2.7
Lublin	3,227.3	9.1	17.8	2.5
Lubuska Land	859.0	2.4	40.8	2.3
Łódź	2,596.2	7.3	19.7	2.7
Małopolska	1,308.7	3.7	9.5	2.6
Mazovia	5,167.6	14.5	23.7	2.8
Opole	1,057.9	3.0	34.9	2.1
Subcarpathia	1,278.9	3.6	10.1	2.4
Podlasie	2,872.6	8.1	34.5	2.9
Pomerania	1739.9	4.9	43.5	2.5
Silesia	776.4	2.2	14.1	2.3
Świętokrzyska Land	1,357.3	3.8	14.3	2.8
Warmia-Mazuria	2,321.3	6.5	53.5	2.4
Wielkopolska	4,583.5	12.9	36.8	2.7
West Pomerania	1,737.6	4.9	58.2	2.2
POLAND – total	35,558.7	100.0	24.5	2.6

Source: own compilation on the basis of data from the AR&MA System of Managerial Information.

Absorption indices

The analysis of spatial differences in the above-presented level of absorption of the EU funds over the studied period (direct payments, the RDP and SOP_Agri measures) concentrated on two indices: the funds obtained per 1 farm and per 1 hectare of agricultural land.

On average, an agricultural holding in Poland (by the AR&MA register) was supported with a total of 24.5 thousand PLN (8.2 thousand annually). This index displayed big territorial differences, both by region (voivodeship) (from 9.5 thousand PLN in Małopolska to 58.2 thousand in West Pomerania (Table 2) and by poviat (from 5.7 thousand PLN in Chrzanów in Małopolska to 85.3 thousand PLN in Łobez in West Pomerania (Fig. 1).

The amount of the EU funds obtained by a farm depended on both its size (the effect of area payments) and its operator's activity in applying for the RDP and SOP_Agri funds. That is why a very low absorption level (under 10 thousand PLN per farm) was characteristic of South-Eastern Poland, mostly the voivodeships of Subcarpathia (14 poviats) and Małopolska (16 poviats, with the threshold of 10 thousand PLN only crossed by three poviats in the north: Miechów, Olkusz, and Proszowice). Apart from those regions, such a low absorption level was

only recorded in single poviats: Będzin, Wodzisław and Żywiec in Silesia as well as in Skarżysko-Kamienna and Starachowice in Świętokrzyska Land.

Fig. 1. Level of absorption of the CAP funds: the sum of direct payments, RDP and SOP_Agri funds per 1 farm.

Source: as in Table 1.

Much higher absorption indices characterised poviats with a favourable farm-size structure, especially those where farmers took an active part in the implementation of the RDP

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and SOP_Agri measures. This is confirmed by the example of 47 AR&MA poviat offices where the sum of payments obtained by a farm exceeded 50 thousand PLN (including 24 poviats with the index exceeding 60 thousand PLN). They were largely located in the voivodeships of northern and north-western Poland (Fig. 1): Kujavia-Pomerania (3 poviats), Lubuska Land (3), Pomerania (5), the most numerous being in Warmia-Mazuria (12 poviats), Wielkopolska (11) and West Pomerania (12).
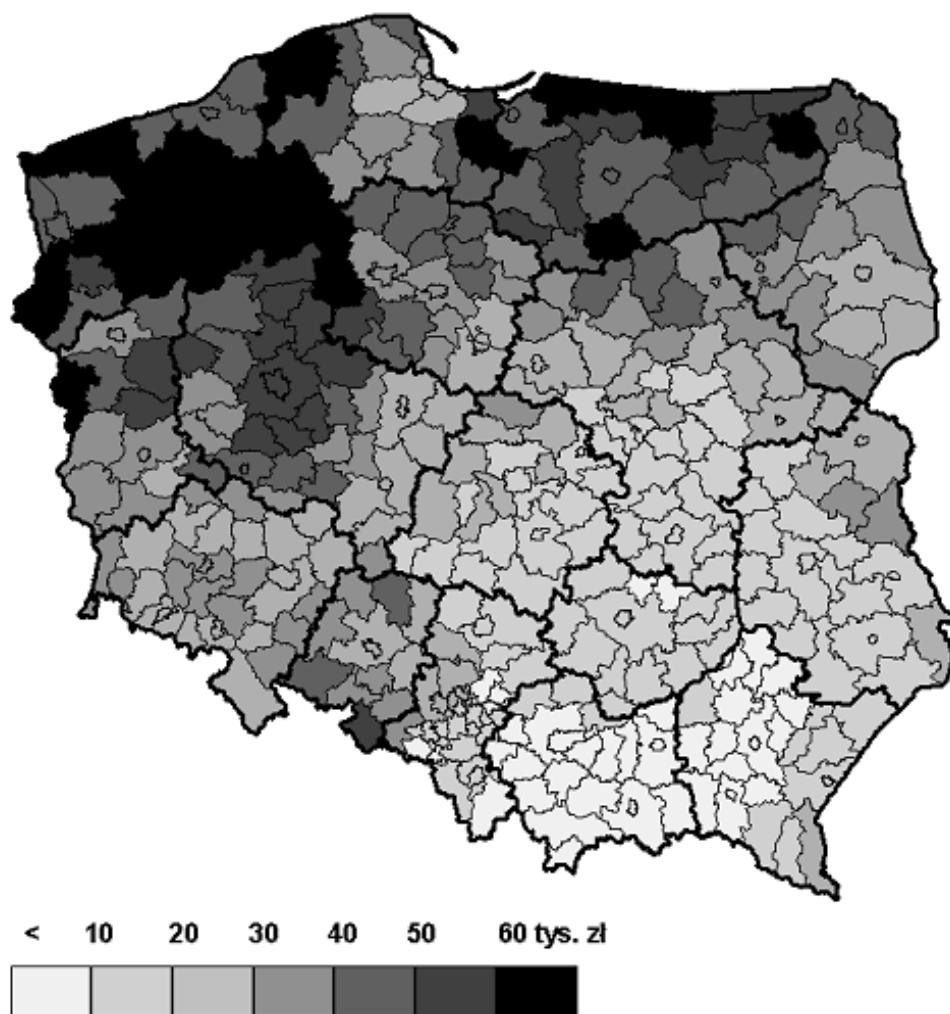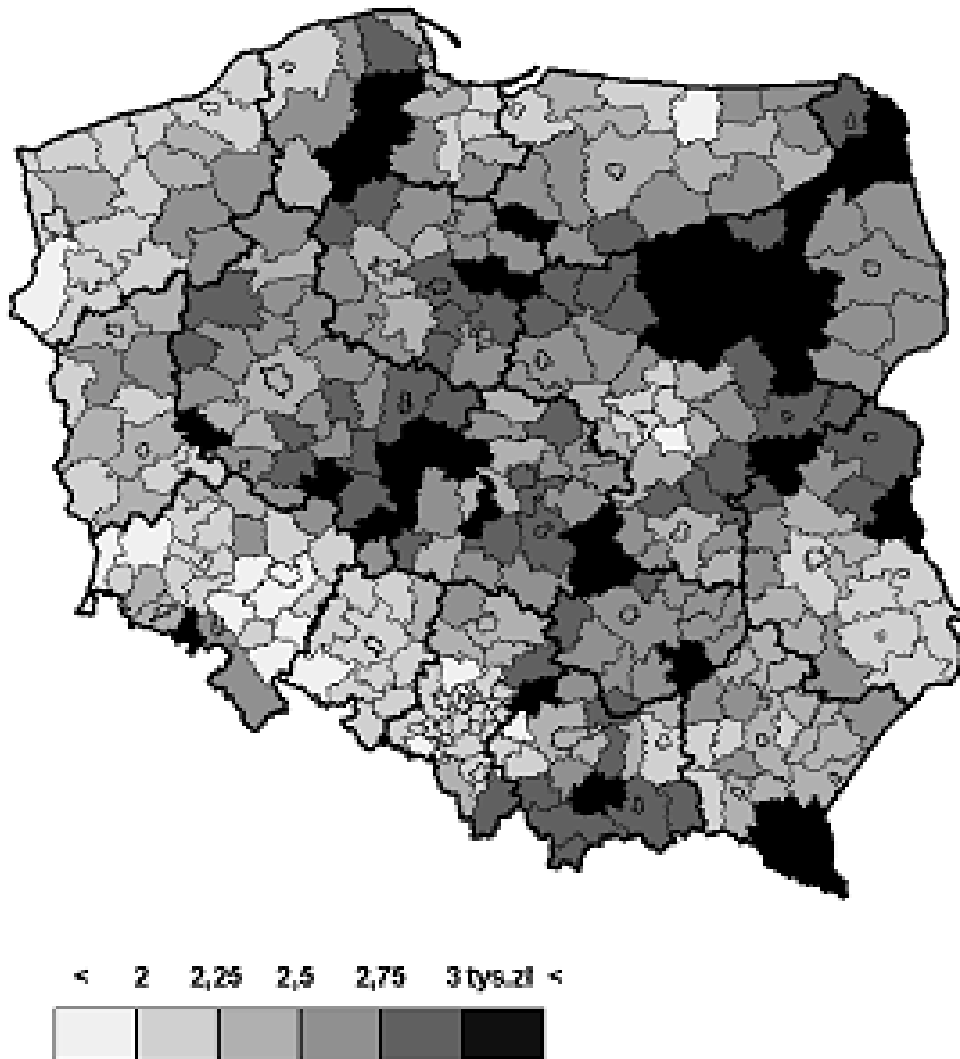

Fig. 2. Level of absorption of the CAP funds: the sum of direct payments, RDP and SOP_Agri funds per 1 hectare AL

Source: as in Table 1.

In comparison with the figures registered in South-Eastern Poland (i.e. the former Austrian partition, with an average of 9.4 thousand PLN/farm) as well as in the central and eastern parts of the country (the former Russian partition, with an average of 21.5 thousand PLN/farm), the indices in the northern and western parts of the country were high. They were determined historically, the lands belonging in the 18th/19th centuries to the former Prussian partition and in the interwar period to Germany (42.4 thousand PLN on average, mostly an effect of the farm size and the scale of direct payments) and to Poland (40.2 thousand PLN on average, a great assistance from the RDP and SOP_Agri funds). In other words, the absorption of the EU funds per farm was higher in areas with a higher, historically developed level of farming. This regularity tended to deepen the structural differences in Polish agriculture.

The level of absorption of the CAP funds was also determined by calculating the sum of the granted direct payments as well as the RDP and SOP_Agri subsidies per 1 hectare of agricultural land. Over the years 2004-2006, this figure averaged 2,562 PLN/ ha AL for the whole of Poland. By region, it ranged from 2,124 PLN in Opole voivodeship to 2,869 PLN in Podlasie (Table 2) and by AR&MA poviat office from 1,907 PLN in Chrzanów poviat (Małopolska) to 3,568 PLN in Rypin poviat in Kujavia-Pomerania (Fig. 2).

The differences in the funds obtained per 1 hectare AL were a result of spatial disproportions in complementary national direct payments (CNDP) claimed by agricultural holdings, primarily those under the RDP and SOP_Agri measures. That is why low values of the per-hectare absorption index were recorded in the voivodeships of northern and western Poland characterised by the highest average sizes of agricultural holdings in the country. This factor ensured for them substantial area payments, which limited their claims for the RDP and SOP_Agri funds. This dependence was borne out by the low payments per 1 hectare AL in the voivodeships of Lower Silesia, Lubuska Land, Opole, Silesia, and West Pomerania (from 2.1 to 2.3 thousand PLN/hectare AL). The situation was found to be especially poor in Lower Silesia, with as many as seven poviats out of a national total of 14 with the lowest absorption level, under 2.0 thousand PLN/hectare AL. Apart from this region, single poviats with such low indices were recorded in the voivodeships of Małopolska (Chrzanów poviat), Mazovia (Piaseczno), Opole (Nysa), Silesia (Tarnowskie Góry, Wodzisław), Warmia-Mazuria (Kętrzyn), and West Pomerania (Gryfino).

The highest values of absorption index (PLN per hectare AL) were recorded in Mazovia voivodeship (2.8 thousand PLN), Podlasie (2.8 thousand) and Świętokrzyska Land (2.8 thousand). By poviat, a very high absorption level (over 3 thousand PLN/hectare AL) was found to occur in 37 units, of which as many as 15 were located in the north-eastern part of the country (seven poviats in Mazovia, six poviats in Podlasie, and two poviats in the northern part of Lublin voivodeship). The poviats of this group also formed minor clusters in the borderland between Wielkopolska and Łódź voivodeships (6 poviats), in Kashubia (Chojnice, Kartuzy, Kościerzyna poviats), the Bieszczady Mountains (Bieszczady, Lesko, Sanok), Dobrzyń Land (Golubie-Dobrzyń, Rypin), and the Opoczno region (Opoczno poviat in Łódź voivodeship and Końskie poviat in Świętokrzyska Land). Single poviats with high index value could be found in Lower Silesia (Kamienna Góra poviat), Małopolska (Limanowa, Olkusz), Świętokrzyska Land (Staszów), Wielkopolska (Wolsztyn), and Warmia-Mazuria (Nowe Miasto) (Fig. 2).

In comparison with the per-farm index, the per-hectare figures displayed smaller spatial disproportions. This was largely due to the predominance of direct area payments in the total absorption amount. In accordance with the CAP preferences, higher index values were recorded primarily in agricultural holdings situated in areas less favourable to farming. This fact ensured

for them compensatory payments in support of farming in less-favoured areas (LFA) and under agri-environmental programmes, and offered greater opportunities for participating in the farmland afforestation programmes. Such an 'additional' financial impulse for agricultural development was found primarily in the mountain regions, the Kashubian Lakeland, in the borderland between Wielkopolska and Łódź voivodeships and in north-eastern Poland (Fig. 2).

Summing up

The conducted analysis showed that over the years 2004-2006 the funds from Common Agricultural Policy programmes were the chief factor of modernisation of Polish agriculture owing to their large scale (35.6 billion PLN) and a great variety of payments (SAP, four CNDP categories, six RDP measures and two SOP_Agri measures). It was found that area payments predominated in the structure of absorption of the EU funds (60%). On the one hand, this fact resulted in high payments per farm in areas with a favourable farm-size structure, and on the other, in mitigating the differences in terms of funds acquired per 1 hectare AL (a rise in the absorption level was mainly recorded in areas eligible for additional RDP measures because of unfavourable natural conditions of farming). Such an allocation of the EU funds had contributed very little to the levelling out of differences in the spatial structure of Polish agriculture. To enhance the impact of EU funds on this process, it is necessary, first, to reduce the proportion of area payments, which are often of a social benefit nature (being available to small agricultural holdings), and secondly, to increase the proportion of funds from the operational measures.

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Instrukcja wypełniania wniosku o przyznanie płatności bezpośrednich do gruntów rolnych lub o przyznanie płatności z tytułu wsparcia działalności rolniczej na obszarach o niekorzystnych warunkach gospodarowania (Guidelines for filling an application form for a direct agricultural payment or a payment in support of farming in less-favoured areas). [2004], [2005], [2006]. ARiMR, Warsaw.

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Good governance and social responsibility in the South African wine industry

Abstract. The paper reviews the institutional structure or strategic framework, the Wine Industry Transformation Charter and Scorecard, adopted on 31 July 2007, through which good governance and social responsibility programmes are fostered, implemented and monitored in the South African wine industry. In other words, the paper outlines how the wine industry seeks to foster social change through integrated socioeconomic support structures, as based on the Wine Industry Plan (WIP). The wine charter and scorecard components are a representation of good governance in the industry, whereas the social capital development approach is the focus of social responsibility programmes in the wine industry. The seven components of the wine transformation charter are: (i) ownership, (ii) management/control, (iii) employment equity, (iv) skills development, (v) enterprise development, (vi) preferential procurement, and (vii) rural development, land reform and poverty alleviation. Five areas that constitute the programmes of social responsibility are: (i) the responsible alcohol use, (ii) rural development and poverty alleviation, (iii) security of tenure, (iv) land, and (v) sectoral determination. The implications for the agri-food sector and conclusions are provided.

Key words: good governance, social responsibility, social capital development approach, wine transformation charter.

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Introduction

The history of colonial encounter, slavery and the apartheid system in South Africa created a dichotomy between white masters and black servants. Such process has been acute in the wine industry with challenges in several areas [The wine… 2007]:

- a highly skewed resource base (e.g. skills, ownership, and control): besides few industry and firm empowerment initiatives, effective black involvement in the industry remains small;
- improving labour relations and fostering human dignity: it is crucial for the industry to improve workers' skill levels and productivity, to raise their standard of living and quality of life, to combat alcoholism, and to provide opportunities to enhance participation;
- security of tenure: evictions create hardship, conflict and social instability; the Extension of Security of Tenure Act (ESTA) aims to provide a legal framework for long-term security of tenure to ensure human dignity of residents is protected;
- advancing women in the industry: although research shows an increase in number of women employed by the industry in full- and part-time positions, it represents a very low base; BEE (Black Economic Empowerment) initiatives must address increased skills development among, employment of and ownership by women, along with access to social amenities;
- economically sustainable BEE initiatives: wine industry is undergoing market innovation and its integration into the global market in the 1990s represent a focus on growth and development;
- an integrated value chain: the competitiveness of the wine industry is dependent on the integrated network of value chains, with empowerment programmes unfolding throughout such process; and
- mobilising knowledge, business acumen, capital, and 'social capital': the wine industry is capital, skills, knowledge and management intensive, and today it relies to a great degree on technology; training, education, networking, representation and social uplift should drive and sustain the BEE process.

All of the above challenges on the South African wine industry agenda must be fostered in order to advance the five key success factors for growth and development, namely (i) the promotion of the 'Brand South Africa' brand; (ii) the acceleration of international distribution; (iii) progress on empowerment and transformation; (iv) attracting more funding for research and development; and(v) improving the skills of labourers and managers [Williamson & Wood 2004]. As a result, the context and implementation of good governance and social responsibility in the South African wine industry is based on the wine transformation charter, and a social capital development approach.

The aim of this paper is to review the institutional environment of good governance and social responsibility in the South African wine industry in terms of frameworks, programmes and actions. To achieve this, the paper begins by theorising on good governance and social responsibility in general. This is followed by transformation in the agri-food sector in terms of the relevance of the developments to good governance and social responsibility. The concept of and programmes on good governance and social

responsibility in the South African wine industry in particular are outlined. The subsequent section details the implication of such good governance and social responsibility measures for the agri-food sector.

The context of good governance and social responsibility

Good governance, in this paper, is defined as the dynamic interaction between people, structures, processes and traditions that support the exercise of legitimate authority in provision of sound leadership, direction, oversight, and control of an entity in order to ensure that its purpose is achieved, and that there is proper accounting for the conduct of its affairs, the use of its resources, and the results of its activities [What… 2010]. Good governance has eight major characteristics: participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and follows the rule of law.

Social responsibility is defined as the responsibility that individuals, government, NGOs and business have towards ensuring a humane society where everybody's human needs and responsibilities are honoured. In this case, the development of social capital with the following outcomes is envisaged:

- empowering citizens who can access support programmes from role players;
- stable community structures;
- reduced vulnerability of the marginalised;
- youth that are well-adjusted, healthy and participating in and contributing to society in a positive manner; and
- community regeneration that eliminates social exclusivity, a legacy of exclusion, broken families, etc. and fosters social cohesion and health problems.

Transformation in the agricultural sector

The changing face, restructuring, and reinvention of agriculture in developed and developing countries in terms of recent global reforms, such as agricultural biotechnology, privatisation, market deregulation, technical innovation, environmental concerns and ethics have changed the structural landscape of the agri-food sector [Boehlje 1999; Cook & Chaddad 2000]. Issues of governance, trust, integrity, credibility, safety, traceability, fair-trade, ethical trade, sustainability reporting, and connecting value with values or cultural influences in global agri-food systems surfaced at various International Food and Agribusiness Management (IAMA) conferences. Several scholars [Hansen & Morrow 1999; Mazzocco 2000; Goldsmith et al. 2004; Louw et al. 2005] began to debate and analyse the meaning and impact of such issues on the agricultural sector. In South Africa, the debate was initiated by Doyer and van Rooyen [2001], with Kirsten's [2003] follow-up presidential address at the 41st AEASA conference, themed 'Agribusiness, Profits and Ethics'. The conference dealt with the role that agribusiness could play in the development agenda in the agri-food sector.

The abovementioned reforms have implications for the South African wine industry's transformation drive. The early proposals of response to the socio-economic disparities in agriculture were based on entitlement and empowerment [Brand et al. 1992]. However, the main response came through legislative measures, such as the Land Reform Act 3 of 1996 and the BBBEE (broad-based Black Economic Empowerment) Act 53 of 2003 [South Africa's… 2003]. For the wine industry, such response came in the form of the Wine Transformation Charter and Scorecard, and the social responsibility programmes to be put in place [Wine… 2007; The wine… 2007a].

Transformation in the South African wine industry

Structure of South African wine industry

The wine industry contributed an estimated R16.3 (€1.66) billion to South Africa's gross domestic product (GDP) in 2003. An amount of R4.2 billion (or €428 million) per annum (2006) is contributed to government revenue via excise taxes. Producers' income amounts to R2610.7 million or €266 million. The industry sustains about 256 000 job opportunities. Investment capital is in excess of R50 (€5.2) billion. In 2006, South Africa was the world's 9th largest wine producer, with 36% of red wine and 64% of white wine from 700 million litres [South African… 2006].

The entering into the global market place by the industry ensured the opening up of new opportunities for South African wine exports, and thus, the demonstration of the competitive edge in the world market. South Africa produces 3.1% of the world's wines and exports 38% of its wine production (271.6 million litres in 2006) to the value of R3.85 billion or (€392 million) per annum. Per capita consumption in South Africa was 8.6 litres in comparison with 47.6 litres in France, 21.8 litres in Australia, 34.6 litres in Argentina and 9.8 litres in the USA.

The evolving wine production structure: the industry is undergoing three interlinked areas of transition:
- deregulation and restructuring
- integration into international value chains
- legislative changes brought about by the democratic government.

This transition has had complex effects. On the one hand, the industry's product mix has changed radically over the past decade, and this has been accompanied by a sustained rise in exports. On the other hand, many producers have found it difficult to break away from the industry's historic reliance on bulk wine production. The industry has experienced a sustained increase in competitiveness as a result of the opening of global markets, scientific research, and the flow of technical information, high regulatory standards and investment in human resources.

Table 1 shows that nearly half of the country's wine farms produce less than 100 tonnes of grapes, while only 270 farms produce more than 1 000 tonnes. This is due to the fact that most commercial farms are small or medium-sized mixed farming enterprises. The 270 largest producers (5.6% of the total) produce 39.6% of the wine grape crop and 56.3% of the producers deliver 95.2% of the crop. This means that 43.7% of active

producers produce a mere 4.8% of the total. This poses a challenge to transform the industry in a meaningful way with such enterprise size limitations.

For the South African wine industry, the institutional environment that advances good governance and social responsibility has been informed by the WIP (Wine Industry Strategy Plan), which was based on and aligned to the Agricultural Strategic Plan [The strategic… 2001; The South African… 2003]. In order to establish an understanding of the agenda for good governance in South Africa, a review of the role that the Wine-BEE Charter and Industry Scorecard process plays in enforcing BEE compliance in the wine industry is undertaken. In terms of the WIP, the following four strategic goals have been emphasised to be achieved simultaneously:

- competitiveness (Wine Competitiveness Report by Esterhuizen and van Rooyen [2006], and the South African Wine Information Systems (SAWIS));
- sustainable natural resource management (Wine of Origin Scheme and Integrated Production of Wine (IPW) by Biodiversity and Wine Initiative (BWI));
- equity (Wine-BEE Charter and Scorecard by the Wine Charter Steering Committee (WCSC), the South African Wine Industry Trust (SAWIT), the South African Wine Industry Council (SAWIC) and later the Wine Industry Development Association (WIDA); and
- social responsibility (Wine Industry Social Compact by the Advisory Forum).

Table 1: The production structure of South African wine industry

Primary wine producers	
production, tonne/year	number of producers*
<1	1 039
1 – 100	1 648
> 100 – 500	1 421
> 500 - 1 000	432
>1 000 - 5 000	265
> 5 000 - 10 000	5
Total	4 810
Wine cellars that crush grapes	
Co-operatives	66
Private wine cellars	477
Producing wholesalers	18
Total	561

*The 2002 Census of Agriculture shows that half of the commercial farms in South Africa have a turnover of less than R300 000

Source: adapted from work by SAWIS [South… 2006].

This paper focuses on the review of the latter two goals of equity and social responsibility.

Table 2: The simplified generic balanced scorecard, the Agri-BEE scorecard, and the Wine-BEE scorecard

Core component of BEE	Indicators	Government balanced scorecard	Agri-BEE scorecard		Wine-BEE scorecard		
		Raw score	FEs[a]	NFEs[b]	Generic[c]	QSEs[d]	EMEs[e]
Direct empowerment score							
Ownership	% share of economic benefits	20	5	15	20 + 3[f]	25 + 8	
Management/ ownership control	% black persons in executive management and/or on executive boards and board committees	10	10	10	10 + 1	25 + 2	
Human resource development and employment equity score							
Employment equity	Weighted employment equity analysis	10	5	10	15 + 3	25 + 2	
Skills development	Skills development expenditure as a proportion of total payroll	20	30	15	15	25 + 5	50
Indirect empowerment score							
Preferential procurement	Procurement from black-owned and empowered enterprises, as a proportion of total procurement	20	5	5	20	25	
Enterprise development	Investment in black-owned and empowered enterprises, as a proportion of total assets	10	30	25 + 15	15	25 + 10	
Residual							
Residual[g]	To be determined by industry	10	15	5	5	25 25	50
Total score		100	100	100	100 + 7	175 + 23	100

[a] Farming enterprises.

[b] Non-farming enterprises.

[c] The scorecard applies to all enterprises, though especially to enterprises in the wine industry (>R30 million turnover p.a.) (Notice the *differential* weights on elements).

[d] Qualifying micro-enterprises (R5 million – R30 million turnover per annum) (NB: notice the *same* weight on all elements).

[e] Exempted micro-enterprises (close to 80% of wine businesses employing a large number of farm workers encouraged and incentivised for voluntary participation score on skills development, and rural development and poverty alleviation (<R5 million turnover p.a.). Most wine enterprises belong to this group.

[f] Bonus points gained by undertaking specific activities.

[g] The Rural Development and Poverty Alleviation component was added as a residual score for the farming and non-farming community in the wine industry.

Source: [The wine… 2007].

Good governance in the South African wine industry

On the achievement of equity, both the South African Wine and Brandy Company (SAWB),[5] and the South African Wine Industry Trust (SAWIT) were tasked to plan and implement a board-based BEE policy by virtue of drafting the Wine-BEE Charter and the Industry Scorecard [The wine… 2007]. The purpose of the Wine Industry Transformation Charter and Scorecard is to reinforce the need for change and development throughout the industry, and to provide tangible goals for achievement of broad-based Black Economic Empowerment (BBBEE) [The wine … 2007].

Such a purpose is aligned with the five key values and characteristics:
- BEE is associated with good governance;
- BEE is broad-based;
- BEE is an inclusive process;
- BEE is Black Economic Empowerment part of South Africa's growth strategy;
- BEE is a voluntary commitment by the participants.

The description and indicators on the seven components upon which the charter and scorecard are based are shown in Table 2.

Implementation and monitoring of the charter and scorecard: the Wine Industry Charter Council will be established in accordance with the Codes of Good Practice. The Charter Council and its activities will be integrated into the structures of the South African Wine Industry Council [The wine… 2007].

Although the above prescribed components apply as adopted by all industry stakeholders, Sefoko et al. [2008] have shown that the perceptions of priority and importance of the respective components by the beneficiaries of BBBEE do not always concur. The ultimate objective was to critically analyse the attitudes towards the Wine-BEE Charter in order to make it more effective in its implementation and monitoring.

Social responsibility in the South African wine industry

Social responsibility in the South African wine industry is based on the report for a workshop entitled 'Making Wine Work for All' held in August 2007, and the recommendations by the social compact as reviewed by the wine industry Advisory Forum [Wine… 2007; Making… 2007]. Together, these documents provide a strategic framework for the implementation of social responsibility in the South African wine industry.

The wine industry is a contentious environment and it is challenged by particular social situations including farm worker conditions, access to services, alcohol related diseases and health problems, a legacy of exclusion, broken families, etc. As such, the South African wine industry has envisaged its focus and scope of activities to emphasise the following.

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[5] The SAWB, formed in 2002, is perceived to be the platform on which both old and new interest groups negotiate for change. The SAWB changed its name to the SA Wine Industry Council in mid-2006.

- Primary focus: the primary focus for social responsibility programmes in the wine industry is based on Social Capital Development.
- Target groups: farm workers, their families and children, women, youth and disabled persons are viewed as the designated target groups for support.
- Responsibility: the SA Wine Council, through the activities of the WIDA will take the responsibility to lead, drive and coordinate agreed upon matters.

Social responsibility programmes and actions

The Advisory Forum recommended that the following programmes and actions should be fostered, if the wine industry is serious about being socially responsible. These included the following.

1. Responsible alcohol use. It was reported that government approved the proposal (not gazetted) by the SA Wine Council regarding a ban on wine sold in low quality foil and plastic containers. This is fostered because many international buyers insist on the complying with ethical regulations. Another issue is the need for support to develop improved early childhood care (e.g., in pre-schools). Training and information regarding responsible social behaviour must be directed towards families in rural areas. The institutional structure to undertake such processes was based on the following: WIDA, Wines of South Africa (WOSA) and the Association for Responsible Alcohol use (ARA) will take a direct interest in this matter with a coordinated plan of action to be prepared for the approval by the Wine Council. Several projects have been initiated in this regard.

- FASFacts; its objective is to develop the children's skills and knowledge, which will enable them to become independent adults and achievers within their communities.
- DopStop: the DopStop programme has been put in place in 2001 to deal with the problem of alcohol abuse on farms, and to generally promote the social responsibility of the consumption of wine.

2. Rural development and poverty alleviation. The 'Rural Development and Poverty Alleviation' component of the Wine Charter will direct and support programmes and activities in the winelands and provide the framework for monitoring direct progress. The issues raised by such component are the following.

- Housing. Provision of housing including access to drinking water and toilet facilities, and support to home ownership.
- Sport/recreation. Contribution to or provision for sport and recreation/cultural facilities as well as transport to participate in such activities.
- Health and welfare. Availability and access to health and welfare services, including, awareness, provision and treatment of HIV/AIDS, malnutrition, alcohol and drug abuse, retirement and funeral schemes.
- Education. Support for ABET and the education of children, including support for farm schools, assistance with school fees, pre-school education, after-school care, encouragement for post-matric education and transport.

- Remuneration. Remuneration above the minimum wage needs to be met as specified in Sectoral Determination 13.
- Social environment. Implementation of measurements against drowning, occurrence of fatal incidences, exposure to danger, access to means of communication, etc.
- Natural environment. Implementation of programmes based on Biodiversity and Wine Initiative and the Integrated Production of Wine guidelines.
- Labour relations environment. Support for freedom of association, access to unions and job security.
3. Land. Land reform is seen as an important element of transformation and social stability in the winelands. The following are addressed.
- Land reform targets. The SA Wine Council supports the government's land reform targets and emphasises cooperation between farmers, cellars, trade, labour, government, civil society and beneficiaries.
- Land purchases and streamlined administration. The Department of Land Affairs (DLA) will be requested to step up land purchases and transfers, in terms of the response to land reform project proposals put to them, approval and implementation.
- Mentorship. Wine industry mentorship to assist economically viable farmer settlement on new transferred land and BEE projects in alignment with the current National Department of Agriculture Mentorship Programme in the wine industry, as coordinated by WIDA.
- Database. A reliable database of all land reform projects within the wine industry to be compiled in cooperation with the provincial governments.
- Land reform models and support. Operational models for land transfers and ownership should be developed to promote rapid access and equity in land ownership and economic activities, as informed by VinPro. In particular, models to give access to farm land through land rental agreements and economically viable farm sizes.
- Funding. Funding institutions should be engaged to develop new funding systems in order to facilitate BEE initiatives in land acquisition and development and agribusiness processing in the wine industry.
4. Security of tenure. The Wine Council considers security of tenure and matters related to farm evictions important for securing growth and stability in the winelands. WIDA will initiate the following in consultation with the Wine Council.
- Request that the ESTA legislation be reviewed and amended to better comply with the original requirements, for the legislation was developed to ensure stable worker environments.
- The DLA be approached to actively inform the public regarding the legal framework of the ESTA legislation. Information sessions are required.
- Any irregularities such as illegal farm evictions, or the false acquisitions thereof, should be officially submitted with the necessary evidence to the DLA.

Representative farmer bodies such as Agri-Wes Cape also to be informed of any such irregularities.

- Municipalities, provincial and the national government should be requested to provide alternative accommodation for evicted workers.
- Regular joint meetings with the directly affected groups should be conducted by the Wine Council and WIDA to monitor progress.

5. Sectoral determination and employment conditions. WIDA, on behalf of the wine industry, take coordinating responsibility to interact with all relevant institutions and in consultation with the Wine Council on the following.

- As a development indicator, the improvement in the quality of life of farm workers and their families, youth and disabled, as a most vulnerable community in the wine industry.
- An official structure should be considered to focus on and provide better protection for casual/seasonal workers.
- Labour brokers to be informed about the legislation regarding labour conditions for farm workers and especially the protection of casual workers.
- Regular joint meetings with the directly affected groups should be conducted to monitor progress.

Conclusions and implications for the agri-food sector

The common responsibility by all stakeholders needs to be instilled. This is expected to drive better coordination in the implementation, monitoring, and evaluation of the much needed governance and social responsibility efforts in order to achieve such milestones.

- Policy implications. Those activities that are premised on both good governance and social responsibility assist the policy-makers to understand the impact of policies. The agricultural sector could refine and implement its Agri-BEE Charter and Scorecard, as well as provide incentive and funding mechanisms.
- Managerial implications.
  - Participating organisations. Leaders and lobbyists within such organisations can make use of abovementioned programmes and actions to align their positions on good governance and social responsibility, in order to better serve their members.
  - Participating enterprises. A wine entity would make use of strategic frameworks to monitor its progress on enterprise development, corporate social investment, rural development, land reform and poverty alleviation. The beneficiaries of such programmes are made aware of organisational goals, the policies affecting them, and their roles and responsibilities within their employer organisations.

The wine industry charter and scorecard must continue to be critically analysed for the improvement of implementation and monitoring processes.

The efforts indicated in this paper as forming the wine industry perspective on social responsibility need to be evenly spread among the five programme areas. In addition, the possible synergies between the different programmes need to be properly harnessed. The

current status of such initiatives does not suggest that these processes are underway, even though investments have been made into some of them already.

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New challenge for competitiveness of an agro-food company: to gain global competitive advantage

Abstract. As globalization continues its rapid pace, business managers must have tools and expertise to discover new ways to obtain gains from trade and new ways to reduce the costs of trade. It is necessary to adopt original approaches, capabilities, and strategies to succeed in world markets. Developing international knowledge is the foremost management challenge in the emerging global market place. The aim of this paper is to introduce the 'Star Analysis' as a method for applying this knowledge to obtain international competitive advantage. The results have been developed by the research project MSM 6215648904 'The Czech Economy in the Process of Integration and Globalisation, and the Development of Agricultural Sector and the Sector of Services under the New Conditions of the Integrated European Market' of Mendel University in Brno, Faculty of Regional Development and International Studies.

Key words: globalization, competitiveness, competitive advantage, star analysis, agro-food sector.

Introduction

'The global market place is the World Cup. It definitely is not one big level playing field. Many top teams vie for supremacy, with the best talent scattered around the world. Teams from many countries bring different traditions and diverse playing styles. Every football team brings a different mix of athletic skills and their competitive strategies vary widely. No competitor can count on home-field advantages. Success requires sufficient endurance and versatility to overcome many teams. Winning requires beating multiple challengers from across the globe' [Spulber 2007, p. 1].

Although the world market offers many opportunities, participating in the global economy does not guarantee success for a country's (company's) economy. It depends on the country's (company's) creativity, capabilities, and resources.

A global business can be built on its home country's geographic advantages and overcome its disadvantages through the creative use of international trade. Regardless of his specialization, a manager must take into account the economic and geographic differences between countries as well as the historical, cultural and social divergence that distinguishes the individual states. A global manager also needs to know how the geographic differences influence the global market; his transactions have to be adjusted for some differences in the level of income, processing, products and good governance between countries and costs of crossing borders.

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Global competitive strategy

The aim of this paper is to identify presumptions for gaining global competitive advantage with special focus on the agro-food sector. The 'Star Analysis' offers a possible approach to determination of opportunities and competitive challenges in a global and at the same time globalized market.

Globalization describes a process of increasing economic integration and can be defined as the process of converting separate national economies into an integrated world economy. A distinctive character of the globalization period which marks the difference to earlier periods of economic integration has two features: (i) deepening of economic integration and (ii) an enlargement of the number of countries taking part in the economic integration [Smělíková, 2006].
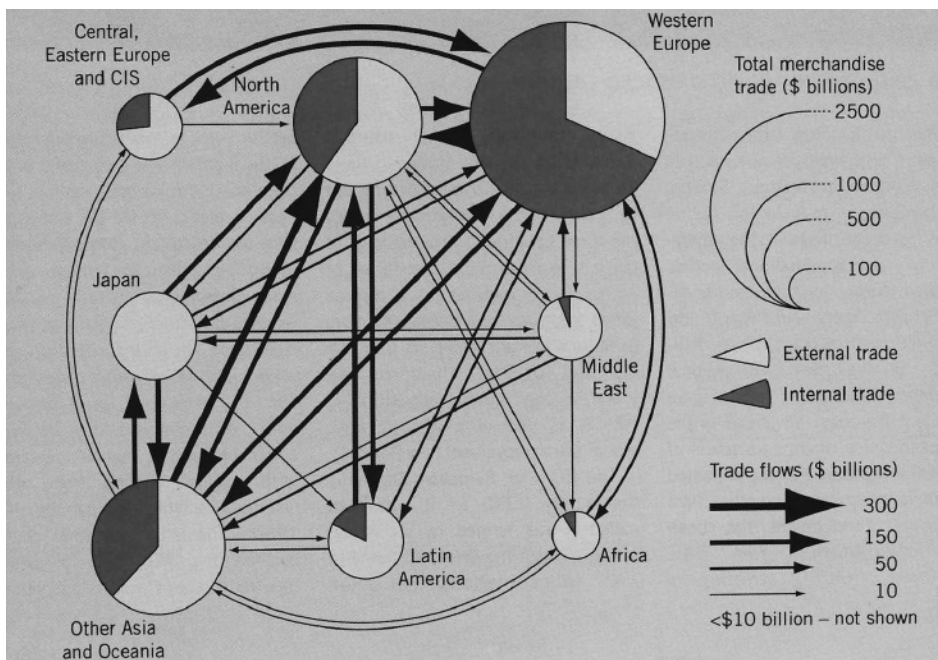

Fig. 1. The world trade network

Source: [Mackinnon & Cumbers 2007].

One of the patterns of an increased global economic integration is its uneven geographical presence. In fact, the world trade has become highly regionalized in recent years, in the sense that for many countries the most important trading partners are neighbouring states. For example, Dicken [2003] notes that for the world's most significant trading region, Western Europe, more than two-thirds of trade take place internally between European states. Similarly, for Asia, as the second largest trading region, half of its trade is internal, while for North America, as another major trading region, the figure is 40 %. The connections between these three world regions are also stronger than connections to other parts of the world (Figure 1). Trading connections

involving Africa, the Middle East, Eastern Europe and former Soviet Union are far fewer in comparison.

According to Spulber [2007] a country's ability to add value depends on many underlying geographic differences between countries. These include climate, availability of agricultural land, endowments of exhaustible natural resources, such as petroleum, natural gas, and metals, access to renewable resources, such as forests and fisheries, human capital. Differences in the human capital of a country's labour force play an important role, although work force skills can be improved through education and training, etc.

Managers face significant challenges in designing their own global competitive strategy. To obtain the necessary information, they can perform a 'Star Analysis' (Figure 2) examining the major international geographic factors driving the international business. Spulber [2007] distinguishes the following five factors:

- features of company's home country, they affect its competitive performance
- features of supplier countries, they determine the company's competitive potential
- features of customer countries, they influence demand for the company's products
- features of partner countries, they have an impact on the company's productive efficiency and attraction to customers
- features of competitors' countries, they determine the competitive advantage in international business.

The above mentioned five major factors provide a global business strategy context for a country (company). A manager should know, when the features of its home country empower or restrict its strategic choices and when the company exceed its home country. It is the manager's responsibility to determine the impact of the features of supplier countries on the choice of the place, where the firm procures goods and services or carries out manufacturing. Also, a manager should be fully aware of how the firm's relationships with its customers might be affected by the features of target countries. The company needs to comprehend how the features of the partner countries can be beneficial to extending its manufacturing and distribution capabilities. In the end, competitive strategy requires a company's knowledge of their competitors' countries context. In other words, this analysis offers a general framework for gathering and processing data about global markets; it helps to analyse international economic features and it develops information in order to use it for designing a competitive strategy.

Five important strategic prescriptions are the result of the 'Star Analysis':

- surmount demand and supply restrictions through international transactions and make the best of the strengths of your company's home country
- find the best inputs for your firm's strategy through choosing the right supplier countries
- choose customer countries in order to maximize net gains from trade
- target partner countries to find the best demand-side and supply-side settings
- wait until competitors configure the best combination of their home, customer, partner, and supplier country locations.

This analysis is essentially dynamic, as the national economies are in a constant state of fluctuation. Not only changes in the home country are important, but a company must also monitor changes in its supplier markets as well as customer markets. Opportunities for transactions that connect countries are changing constantly too. These opportunities appear, as the trade costs fall with globalization. The company should observe new opportunities by monitoring changes in relative prices and wages between pairs of countries. The categories in the 'Star Analysis' are equal to the needs of a manager whose duty is to formulate a global strategy and design a global business organization. The manager may recognize some critical changes in the business environment and determine what types of responses are needed.
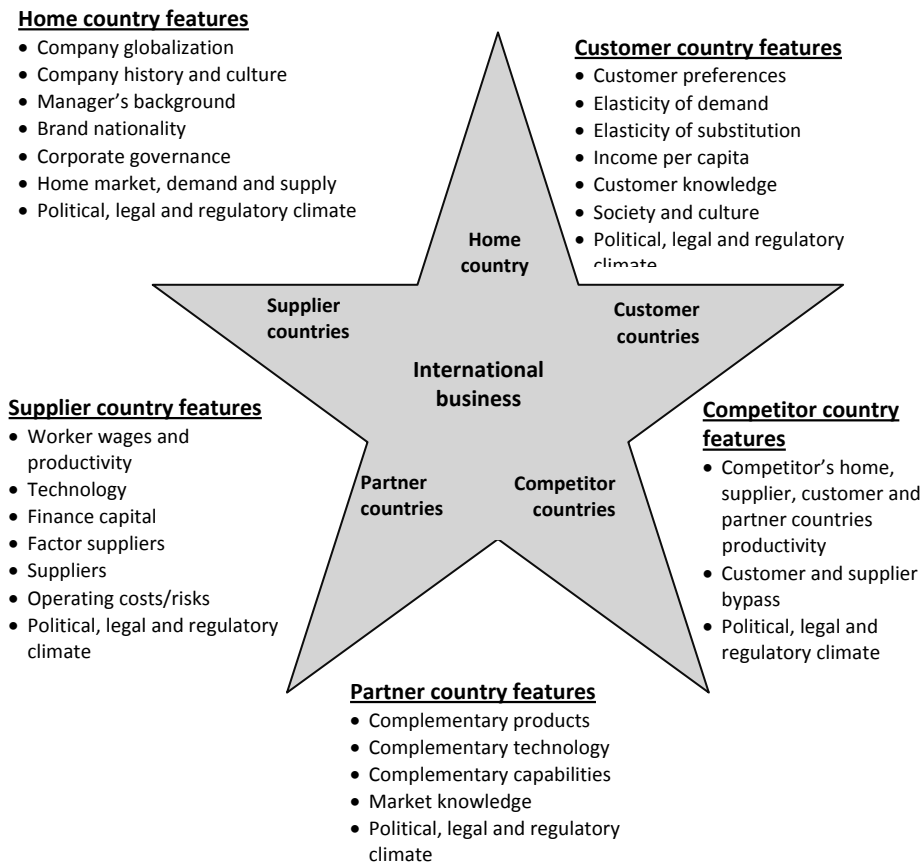
Home country features
- Company globalization
- Company history and culture
- Manager's background
- Brand nationality
- Corporate governance
- Home market, demand and supply
- Political, legal and regulatory climate

Customer country features
- Customer preferences
- Elasticity of demand
- Elasticity of substitution
- Income per capita
- Customer knowledge
- Society and culture
- Political, legal and regulatory climate

Supplier country features
- Worker wages and productivity
- Technology
- Finance capital
- Factor suppliers
- Suppliers
- Operating costs/risks
- Political, legal and regulatory climate

Competitor country features
- Competitor's home, supplier, customer and partner countries productivity
- Customer and supplier bypass
- Political, legal and regulatory climate

Partner country features
- Complementary products
- Complementary technology
- Complementary capabilities
- Market knowledge
- Political, legal and regulatory climate

Home country

Supplier countries

Customer countries

International business

Partner countries

Competitor countries

Fig. 2. The global business strategy 'Star Analysis' for global competitive advantage
Source: according to Spulbar [2007, p. 38], processed by author.

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Economic differences between countries depend on underlying differences in population characteristics: size, density, level of education, and health. Alternatively, economic variations in income and wealth influence demographic trends, such as the population growth, the quality of health care and choices of education. It is necessary for an international business manager to be familiar with all demographic information in detail. Each country's population has a different set of statistics, and these are the key elements that drive strategic decisions. Each country differs in its set of statistics, and these sets are the key elements for carrying strategic decisions.

Agriculture and contemporary agribusiness concept

'Agriculture has become a part of considerably wide-ranging complex that determines not only the conditions of its success in selling products in the future food markets but also the nature and dimension of agriculture production firms in specific areas' [Bečvářová 2005, p. 285].

The last decades has witnessed considerable changes in the agrarian sector across the whole world. The increased integration of markets and the rapid growth has acted as a major stimulus to trade between and within regions and has resulted in major shifts in geographical and commodity distribution.

In fact, the food and agribusiness system is the largest economic sector[2] in the world economy, representing 50% of global assets, 50% of the global labour force and 50% of global consumer expenditures [Darkwah 2007]. Even in the developed countries, with agriculture being a relatively small part of the whole economy, the agribusiness sector generates significant economic activities.

Darkwah [2007] indicates five typical traits of the contemporary agricultural enterprises' economic climate and the competitive environment that could be characterised by:

- global competition
- adoption of new technology and industrialisation of primary production, processing and distribution
- precision farming with more relevant information and the necessity of using R&D results
- persistent changes in the demand for food products with a high product differentiation
- systems or food production chains and world food distribution nets increasing consolidation at all levels of agribusiness and bringing about market power exhibit and control.

Aside from the above mentioned characteristics, we have to take into account also some specific patterns of agro-food sector which hang closely together with the nature of the final product (e.g. perishability of production) or result from random factors such as weather, diseases and other biological risks (qualitative and quantitative variability of agriculture inputs supply), as well as time delays between subsequent production

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[2] According to the contemporary situation, the agribusiness can be defined as a sequence of interrelated subsectors made up of genetic and seedstock firms, input suppliers, agricultural producers, merchants or first handlers, processors, retailers and consumers.

stages. Because of the fact, that some of agricultural commodities underlie the process of conservation or transformation before final sale, the success of primary agricultural companies is influenced also by the other stages of the value chain [Bečvářová 2005].

From the above point of view, the commercial fortune of the food industry become the crucial precondition in the agro-food chain by increasing agricultural enterprises competitiveness, although their connections to consumers are not enormously immediate.

As far as the primary agricultural production is concerned, changes have affected the technology, the economic climate, the institutional structure and notably the way of doing business. New concepts of how to successfully survive in the changing economic environment are determined by a close knowledge of the international agribusiness development and its influence on all industries that have interest in food production.

The food production and distribution industries are undergoing a significant change that transforms not only the firms participating in those industries, but also the structure, interrelationships and economic aspects up and downstream the agro-food chains. Food retailers and final processors behave as 'spokespersons' of consumer influence on demand for food, not only from the point of view of food security, quality and availability, but also in the price formation and other policy conditions within the overall framework of the agro-food chain.

In fact, food processors and retailers use their market power to maximize their profit through the high share in the consumer price of food. On the contrary, the agricultural companies dispose of minimal market power and face a strong competition from the final links within the agro-food chains.

'Considerations of size and scale as well as who is to manage, control and finance farming and agribusiness operations lead to a conclusion that a mono(bi)poly prevails in processing stages and retail trade rather than an originally pure competition in primary agricultural production' [Bečvářová 2005, p. 288]. The industry is becoming more globalised, integrated, more industrialised, more specialised and more managerially intense.

Conclusions

The fact that business today is international is indisputable. During the last decade, there has been a rapid growth in both international trade and foreign direct investments. Many markets have become really global. Globalization, industrialisation and consolidation are the most actual features in the agro-food sector as well as in the whole world market. Fast technological progress, new methods of trade and distribution have been affecting the individual stages within the agro-food chains, from primary agricultural input producers through production of agricultural products, processing phase and finally distribution and retail stages.

Food and agribusiness firms are confronted with a great competition in the agro-food global markets. The trend will be towards greater interdependence, when the main aspect of competitiveness will not be the only ability to be responsive to changing customer needs and business environmental challenges, but also to cost decreasing, product efficiency and delivery reliability. As a result, production costs of the diverse products will probably become lower in a more coordinated system. It indicates that

successful negotiations, a perfect information knowledge, linkages between suppliers and customers or a choice of proper partners will be highly important for the market position and the financial performance. These developments will create a need for stable partnerships (vertical coordination, vertical integration etc.)

This paper has identified presumptions for gaining a global competitive advantage with special focus on the agro-food sector. Presented 'Star Analysis' offers a possible approach to determination of opportunities and competitive challenges in the global market. Depending on the company's capabilities, a manager chooses the best match between the company skills and market opportunities. Then it is required to apply the best strategy or combination of strategies to gain competitive advantage.

Global strategies prove the difficulty and the intricacy of strategy making in an international environment. Manoeuvring has much more options than choosing only low-cost or high-product quality strategy. A global manager has a lot of alternatives when selecting a particular technology, concrete product features, business transactions and methods. These strategic alternatives are strengthened by geographic aspects. A global manager chooses partner countries, customer countries, and supplier countries in order to be effective in implementing the firm's strategy.

The 'Star Analysis' provides a method for analyzing the global business environment. It systematically integrates country-level data with competitor analysis. The different country profiles of the company and its competitors provide ways for creating a global competitive strategy.

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Prospects of table eggs production in Belarus

Abstract. Problems of development of egg production in Belarus are considered. Dynamics of volume of egg production is considered for the period of 1995-2009. Results of production and sale of eggs by integrated (mass production) poultry farms are analyzed by means of a correlation method.

Key words: egg production, poultry farming, production efficiency, efficiency factors.

Introduction

Poultry farming is one of the basic branches of agriculture worldwide. Eggs, meat of young and adult birds like hens, ducks, geese, turkeys, guinea-fowls and also processed products (egg powder, liver meat pie, ends of cuts, powdered soup sets, edible offal, canned food, sausages) and a lot of others are on the list of products which are supplied by poultry farming. Altogether 3 billion eggs is produced annually in Belarus, including 1.8 of billion in the public sector and 1.2 billion in private homesteads. It makes 300 eggs a year, or 18 kg per capita a year. In the European Union countries it is 14 kg, in the USA and France 18 kg, in the Baltic states, Poland and Ukraine between 11 kg and 12 kg are produced per capita. It is visible from the above quoted data that the level of egg production reached in Belarus corresponds to the level in the developed countries. It is planned in Belarus for 2010 to produce 2.2 billion eggs, and taking into account their production in private homesteads run by part-time farmers not less than 3.5 billion eggs as well as 258 thousand ton of poultry meat [Волчков 2007; Михалевич 2010].

However, growth in production volume does not mean an efficiency growth. Actually, there are a lot of problems in this sphere. The domestic market of Belarus cannot absorb such quantity of eggs and therefore a considerable part of this production is sold in the foreign markets, in particular in the Russian Federation. Recently, it has appeared that the export price for this kind of product is falls below the cost. On the other hand, the prices of industrial inputs have increased. Investments are required for re-equipment of integrated poultry farms according to modern technologies. At the same time the profitability of egg production has decreased in relation to the previous period, the quantity of unprofitable

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organizations has increased. All that has caused a need of detailed analysis of the situation and determination of development prospects for the Belarussian poultry farming in the tideway of world tendencies.

Object and methods of research

As an initial information for carrying out the research, data on the work of organizations belonging to a republican association 'Belptitseprom' for years 2007-2009 have served. As technical, economic and productive indicators of functioning of individual integrated poultry farms, the following ones have been chosen:
- production cost of thousand eggs, thousand rubles
- cost of 1 tonne of fodder, thousand rubles
- sale price per thousand eggs, thousand rubles
- egg production, million eggs
- expense of fodder per thousand eggs, fodder units
- annual egg production per hen, eggs
- labour input per thousand eggs, man-hours
- enterprise profit, million rubles
- profitability level, %.

Correlation analysis has been used to reveal tendencies of branch development. It has also been used in defining the degree of influence of efficiency factors on production in the poultry-farming enterprises of republican association 'Belptitseprom'.

Results of research

The Belarussian poultry farming has passed a long way of development. It has evolved from a secondary branch to a developed specialized branch of agriculture nowadays. Poultry farming shows rates of fast development all over the world. It is one of basic, rather inexpensive, sources of a dietary food for the population. The basic producers in poultry farming in Belarus are the agricultural enterprises. They are a part of the republican association 'Belptitseprom'. It consists of 4 poultry breeding enterprises, 12 egg producing enterprises, 11 poultry meat producing enterprises, 2 enterprises of fodder mix industry and the Kvasevichsky feather and down processing factory. The largest egg producing integrated poultry farms are located in Orshansk, Gorodok, Kobrinsk, Baranovichy, Grodno, Novobelitsk, Bobruisk, Pridneprovsk, Soligorsk, then come the First Minsk and Krupsky enterprises. An average number of laying hens stays over 300 thousand heads and the total production of eggs makes about 100 million eggs [Цыбульский 2009]. They produce 58% of eggs in 'Belptitseprom'. The poultry-farming enterprises satisfy completely the demand from the population of republic and they export a part of their produce to the nearest countries.

A tendency of recession in total production of eggs was observed in Belarus throughout a number of years (Table 1). It was reflected in production numbers per capita of the population.

Table 1. Production of food eggs by enterprises of all categories

Indicator	Year										
	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bird livestock, million heads	26.4	27.4	26.2	25.2	24.5	25.1	28.5	28.7	29.4	31.2	34.1
Total national egg production, million egg	3373	3288	3144	2923	2824	2950	3103	3337	3228	3312	3430
Within that regions:											
- Brest	506	535	513	484	467	502	505	530	479	500	528
- Vitebsk	528	490	464	424	385	380	414	441	443	482	489
- Gomel	463	469	455	393	385	392	422	467	456	501	498
- Grodno	467	449	417	398	370	382	388	367	364	363	385
- Minsk	943	927	901	838	855	921	979	1108	1056	1029	1082
- Mogilyov	466	418	394	386	362	373	395	424	430	437	448
Production per capita, egg	331	329	315	294	286	300	317	343	333	342	355
Consumption per capita, egg	237	224	224	227	224	238	256	276	275	279	286

Source: http://mshp.minsk.by

Then the population of Belarus began to consume more eggs. The consumption level per capita has come nearer to a scientifically approved level in 2009. However, the egg production in the country exceeds the consumption level (by 24% in 2009). It means that the production volume makes it necessary to find sales markets abroad.

The most of egg production is concentrated in the Minsk region.
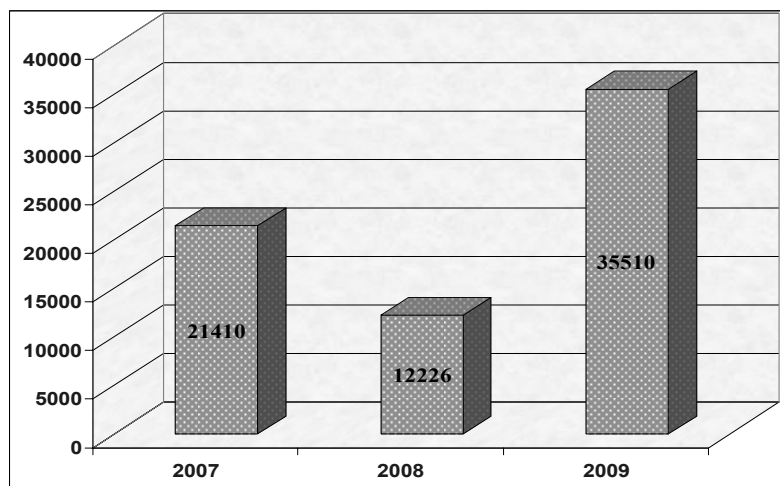
Fig. 1. Profits in egg production, million ruble[3]

Source: own calculations basing on data from the State Committee of Statistics of Belarus.

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[3] 3000 BRB (Byelorussian ruble) = 1 USD.

An overall indicator of performance of integrated poultry farms is the size of the received profit or loss.

Therefore, the dynamics of profit in the integrated poultry farms specialized in egg production in years 2007-2009 has been considered (Figure 1).

The profit received by the enterprises in 2009 exceeded almost three times the profit in 2008. It is a positive tendency but insufficiently steady.

Table 2. Structure of the egg production costs, %

Cost item	Unprofitable enterprises	Enterprises with profitability of 15.0% and more	All enterprises
Wages	7.9	3.8	4.3
Fodder	54.3	74.3	70.0
Heating	3.1	1.6	1.9
Electricity	1.7	2.2	2.0
Veterinary aid	2.0	1.2	1.5
Repairs	2.1	1.9	2.0
Depreciation	-	-	-
Miscellaneous costs	22.4	10.0	13.0
Overhead charge	6.5	5.0	5.3
Cost of 1000 eggs, thousand rubles	251.4	141.4	172.0

Source: own calculations basing on data from 'Belptitseprom'.

Table 3. Matrix of correlation between efficiency factors

Indicator	cost of 1 thousand eggs	cost of 1 tonne of fodder	sale price per thousand eggs	volume of egg product-ion	expense of fodder on 1 thousand eggs	annual egg product-ion per hen	labour input for 1 thousand eggs	enterprise profit	level of profit-ability
cost of 1 thousand eggs	1.000								
cost of 1 tonne of fodder	.534	1.000							
sale price per thousand eggs	.776	.441	1.000						
volume of egg production	-.637	-.413	-.406	1.000					
expense of fodder on 1 thousand eggs	.915	.373	.575	-.552	1.000				
annual egg production per hen	-.810	-.332	-.460	.486	-.952	1.000			
labour input for one thousand eggs	.748	.078	.589	-.582	.631	-.463	1.000		
enterprise profit	-.669	-.317	-.297	.898	-.585	.461	-.750	1.000	
level of profitability	-.937	-.441	-.564	.556	-.888	.764	-.772	.722	1.000

Source: own calculations basing on data from 'Belptitseprom'.

The economic efficiency of poultry farming is determined by five major factors.
- Production processes take place in a specific environment. They can be regulated in the necessary direction.

- High rates of reproduction and precocity.
- Fast economic recovery of fodder inputs.
- Integrated poultry farms are technically equipped with complex mechanization of technological processes.
- High profitability of poultry farming and recovery of capital investments.

Therefore it is further necessary to analyze the condition of specified factors. First, the cost structure of egg production was considered. The set of integrated poultry farms has been divided into two groups on the grounds of their profitability.

The profitable enterprises spend more on fodder. In the unprofitable integrated poultry farms the expense of fodder (Table 2) is smaller.

The production cost of 1000 eggs in the unprofitable enterprises was 78% higher than in the profitable ones.

A question arises about the degree of influence of various factors on results of production and its efficiency.

An analysis of the matrix of pair correlations between the factors (Table 3) allows to draw a conclusion that the cost of 1 thousand eggs is closely connected with the production volume ($r_{1.4}$ = -0.637), the expense of fodder on 1 thousand eggs ($r_{1.5}$ = 0.915), the productivity per hen ($r_{1.6}$ = -0.810) and the labour input per 1 thousand eggs ($r_{1.7}$ = 0.748).

The profit is closely connected with the production volume ($r_{8.4}$ = 0.898), the expense of fodder on 1 thousand eggs ($r_{8.5}$ = -0.585) and the labour input per 1 thousand eggs ($r_{8.7}$ = -0.750).

The profitability level is connected closely with the cost and with the sale price ($r_{9.1}$ = -0.937 and $r_{9.4}$ = 0.564 respectively).

An analysis of variance testifies that the profitability of production is formed in 73.4% depending on variation of the production cost and only in 26.6 % depending on the sale price.

Hence, the end results are formed in appreciable way by concrete parameters in the enterprises of the branch. The role of so called external factors is much smaller.

It is a result of the republican government's work on stabilization of production inputs markets and sales markets (in 2007 and in 2008 the shares of the specified components were approximately equal to 51.2% and 48.8% respectively).

A regression model has been constructed for revealing the quantitative influence of individual factors on production cost (Y). The following factors have been included:

X_1 – cost of 1 tonne of fodder, thousand ruble

X_2 – volume of egg production, million eggs

X_3 – expense of fodder on 1 thousand eggs, fodder units

X_4 – annual egg productivity per 1 hen, eggs

X_5 – labour input per 1 thousand eggs, man-hours.

The following model has been received as a result of calculations and a check on significance of the coefficients

$Y = -110.9634 + 0.1361X_1 - 0.0098X_2 + 1.3462X_3 - 0.1048X_4 + 20.3630X_5$

$R = 0.977$,

$F = 58.4$

The determination coefficient (R^2) shows that the variation of production cost is determined in 95.4% by the variation of factors included in the model.

Enterprises of the branch have been grouped on the grounds of the level of use of factors specified in the model. The criterion of grouping was defined as a relation of the cost according to the model to its actual level, multiplied by 100 (Table 4).

An analysis of data in Table 4 shows the highest production profitability in the group of enterprises with cost of fodder smaller than 600 thousand ruble per tonne.

These enterprises receive also higher profits and bear less cost per 1000 eggs.

Table 4. Cost of 1 ton of fodder and the egg production efficiency

Group of enterprises by fodder cost, thousand ruble/tonne	Average in the group, thousand ruble/tonne	Production cost per 1000 eggs, thousand ruble	Profit on 1000 eggs, thousand ruble	Level of profitability, %
up to 600.0	566.7	151.9	18.7	12.3
600.1 - 750.0	642.7	162.6	18.5	11.4
above 750.0	817.0	213.8	6.8	3.2
average	665.4	172.0	17.4	10.1

Source: own calculations basing on data from 'Belptitseprom'.

Grouping of integrated poultry farms by the level of expense of fodder on 1000 eggs is presented in Table 5. The production profitability is the highest in the group with the expense of fodder smaller than 135 fodder units per 1000 eggs. The cost is lower in this group and the profit higher in comparison to the other groups.

Table 5. Expense of fodder per 1000 eggs and production efficiency

Group of enterprises by the fodder expense per thousand eggs, fodder units	Average expense in the group, fodder units	Cost of 1000 eggs, thousand ruble	Profit on 1000 eggs, thousand ruble	Level of profitability, %
up to 135	133	147.9	25.1	17.0
141 - 150	144	155.9	18.4	11.8
above 150	174	214.1	-2.1	-0.9
average	150	172.0	17.44	10.1

Source: own calculations basing on data from 'Belptitseprom'.

Volume of egg production exerts a considerable impact on its efficiency. Therefore three groups of the enterprises have been discerned according to the volume of production (Table 6).

Table 6. Production volume and an overall performance of the enterprises

Group of enterprises by volume of egg production, million egg	Average volume in the group, million egg	Labour input per 1000 eggs, man-hours	. Cost of 1000 eggs, thousand ruble	Profit per 1000 eggs, million ruble	Level of profitability, %
up to 100.0	41.6	0.3	138.6	180	1.8
100.1 - 200.0	154.7	0.8	150.1	2790.5	11.6
above 200.0	290.2	1.6	199.4	7767.0	16.9
average	112.9	1.1	172.0	1968.5	10.1

Source: own calculations basing on data from 'Belptitseprom'.

Apparently, great volumes of egg production allow to receive better economic results. The profitability in the group of integrated poultry farms with volume of production bigger than 200 million eggs a year is the highest and reaches 16.9%. However, the labour inputs and the cost of 1000 eggs are also the highest in these enterprises. But these expenses pay off with a higher profit.

Not all enterprises use available resources in 100%. Therefore, it is possible to discern two groups of enterprises from this perspective and check on the production efficiency in each of them. The enterprises using resources in more than 100% spend less cost for 1000 eggs. The more intensive farms use less labour and fodder per 1000 eggs and they receive more eggs from 1 layer (Table 7).

Table 7. Level of resource use and an overall performance of the enterprises

Group of enterprises by level of resources use, %	Average level of use in the group, %	Production of eggs, million egg	Expense of fodder per 1000 eggs, fodder unit	Labour input per 1000 eggs, man-hour	Productivity of 1 hen, eggs/year	Cost per 1000 eggs, thousand ruble
up to 100.0	96.3	116.2	156.2	1.3	292.8	187.4
above 100.0	104.6	110.1	145.1	0.9	305.3	158.7
average	100.0	112.9	150.4	1.1	299.5	172.0

Source: own calculations basing on data from 'Belptitseprom'.

It is known that a higher level of bird's productivity allows to lower specific expenses and to increase production efficiency. Therefore three groups of integrated poultry farms, basing on annual number of eggs from 1 layer, were distinguished (Table 8).

Table 8. Layer productivity and an overall performance of the enterprises

Group of enterprises by annual production of eggs from 1 hen-layer, egg	Average production in the group, egg	Labour input per 1000 eggs, man-hour	Expense of fodder per 1000 eggs, fodder unit	Profit per 1000 eggs, thousand ruble	Level of profitability, %
up to 300	258	2.10	181.7	-6.1	-6.5
301 - 310	307	0.93	143.2	14.9	9.9
above 310	319	0.6	137.8	25.4	14.3
average	300	1.1	150.4	17.4	10.1

Source: own calculations basing on data from 'Belptitseprom'.

The profitability in the group with number of eggs from 1 layer bigger than 310 eggs a year is the highest. In this group the highest profit is connected with smaller inputs of labour and fodder per 1000 eggs.

The Belarussian poultry farming has had an export orientation. The basic sale market is the Russian one. The export prices of eggs have increased from 0.04$ to 0.076$ per egg in the period of 2003-2008. Therefore the integrated poultry farms can receive profit only when the production cost of 1000 eggs is less than 228 thousand ruble. But the price situation can change at any moment and the prices can fall. Those enterprises can receive profit which have smaller costs, bigger production volume and an above average level of use of resources.

Conclusions

Thus, the research allows for drawing the following conclusions.

- A part of integrated poultry farms in Belarus produces in an ineffective way. Too big inputs of labour and fodder lead to a high production cost of eggs. Production of eggs is most effective in the enterprises using cheaper fodder (less than 600 thousand ruble per tonne), producing over 200 million eggs a year, using resources more than in 100 %, reaching productivity of more than 310 eggs per 1 layer a year.
- The volume of egg production exceeds the level of their consumption by the population of Belarus. Therefore, the branch will further keep the export orientation. The market of Russian Federation still remains the main sale market. But search of other outlet markets is necessary. Otherwise the production volume might need a reduction. It can be reflected negatively in the branch condition.

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Role of good governance in the development of a commune within a sub-region

Abstract. Topic of good governance is an issue of great importance to quality of governance, understood as the manner and effects of governance, which basically amounts to administrative action. Recently the terms 'governance' and 'good governance' are being increasingly used in the literature. Bad governance is being increasingly regarded as one of the root causes of all bad things within communities and public administration on the local as well as on the national level. That is why the paper shows the main role of good governance in the functioning of a commune in a sub-region and its influence on the creation of development strategies and on improving of living conditions in the local areas.

Key words: commune, good governance.

Introduction

Good governance leads to good management, good performance, good stewardship of public money, good public engagement and, ultimately, good outcomes. The governors of public service organisations face a difficult task. They are the people responsible for governance, i.e. the leadership, direction and control of the organisations they work for. Their responsibility is to ensure that they address the purpose and objectives of these organisations and that they work in the public interest. They have to bring about positive outcomes for the people who use the services, as well as to provide a good value for the taxpayers who fund these services. They have to balance the public interest with their accountability to government and with an increasingly complex regulatory environment, and to motivate the front-line staff by making sure that good executive leadership is in place [The Good… 2004, p. 5]. Because of that all public organisations need a good governance in public services of a high standard. It is important to start from the bottom of the administrative hierarchy, namely self government units like communes, for providing some ideas to create an intelligent community. That is why the main aim of this paper is to show the role of good governance in the development of a commune within a theoretical frame and a practical one, exemplified by a case study.

Methodology

An analysis of literature as well as of national and international reports and documents provided by communal authorities has been mainly used in this paper. In a case study, a

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survey has been used in order to determine the level of good governing and its influence on the development of a basic local government unit, namely the Zbuczyn commune.

Good governance: a short overview

The concept of 'governance' is not new. It is as old as the human civilization. 'Governance' simply means the process of decision-making and the process by which decisions are implemented (or not implemented). This term can be used in several contexts, such as a corporate governance, an international governance, a national governance and a local governance. Since the governance is a process of decision-making and a process by which decisions are implemented, an analysis of governance focuses on formal and informal actors involved in decision-making and implementing the decisions made and on formal and informal structures that have been set in place to arrive at and implement the decision [http://www.unescap.org/huset/gg/governance.htm].

Defining good governance is a very difficult thing and it has long been a topic of discussion in the international arena, and particularly in the field of development assistance. Indeed, 'good governance' means a competent management of country's resources and affairs in a manner that is open, transparent, accountable, equitable and responsive to people's needs.

There are many definitions implemented by different organizations, like the World Bank or the United States Agency for International Development (USAID). According to the World Bank`s concept (which was the first organization in the world to introduce the definition of good governance in the 90ies of the 20th century) a good governance has 8 major characteristics (Figure 1). It is participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rules of law. It assures that corruption is minimized, the views of minorities are taken into account and that the voices of the most vulnerable in society are heard in decision-making. It is also responsive to the present and future needs of society.

Fig.1. Characteristics of good governance
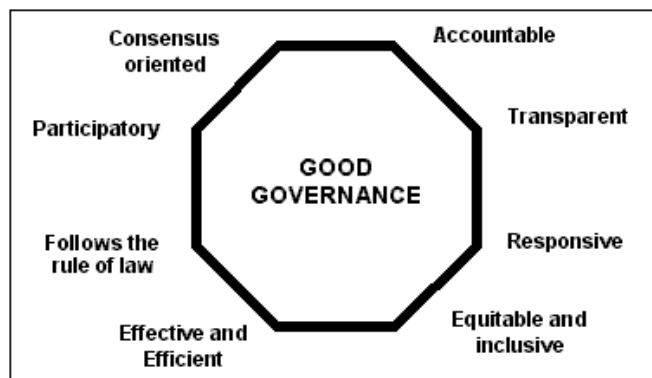
Source: [http://www.unescap.org/huset/gg/governance.htm 2010].

Participation by both men and women is a key cornerstone of good governance. Participation could be either direct or through legitimate intermediate institutions or

representatives. It is important to point out that a representative democracy does not necessarily mean that the concerns of the most vulnerable in society would be taken into consideration in decision making. The participation needs to be informed and organized. This means a freedom of association and expression on the one hand and an organized civil society on the other hand.

Rule of law. Good governance requires fair legal frameworks that are enforced impartially. It also requires a full protection of human rights, particularly those of minorities. An impartial enforcement of law requires an independent judiciary and an impartial and incorruptible police force.

Transparency means that decisions taken and their enforcement are done in a manner that follows rules and regulations. It also means that information is freely available and directly accessible to those who will be affected by such decisions and their enforcement. It also means that enough information is provided and that it is provided in easily understandable forms and media.

Responsiveness. Good governance requires that institutions and processes try to serve all stakeholders within a reasonable timeframe.

Consensus oriented. There are several actors and as many viewpoints in a given society. Good governance requires mediation of the different interests in society to reach a broad consensus in society on what is in the best interest of the whole community and how this can be achieved. It also requires a broad and long-term perspective on what is needed for sustainable human development and how to achieve the goals of such development. This can only result from an understanding of the historical, cultural and social contexts of a given society or community.

Equity and **inclusiveness**. A society's wellbeing depends on ensuring that all its members feel that they have a stake in it and do not feel excluded from the mainstream of society. This requires that all groups, but particularly the most vulnerable, have opportunities to improve or maintain their wellbeing.

Effectiveness and **efficiency**. Good governance means that processes and institutions produce results that meet the needs of society while making the best use of resources at their disposal. The concept of efficiency in the context of good governance also covers the sustainable use of natural resources and the protection of the environment.

Accountability is a key requirement of good governance. Not only governmental institutions but also the private sector and civil society organizations must be accountable to the public and to their institutional stakeholders. Who is accountable to whom varies depending on whether decisions or actions taken are internal or external to an organization or institution. In general an organization or an institution is accountable to those who will be affected by its decisions or actions. Accountability cannot be enforced without transparency and the rule of law [What… 2010].

But the most appropriate description of good governance in accordance with the main idea of this paper is the concept of Ministry of Regional Development in Poland:

'Good governance is the exercise of public authority in the relationships between the government, administration and society, characterized by openness, partnership, accountability, effectiveness, efficiency and consistency'.

This definition takes into account the participation in the exercise of authority of three groups of actors: government, administration and society, because only their consistent co-operation can ensure an effective implementation of the functions of state. An indication of the government, administration and society at the same time takes into account the

definition of good governance roles in decision making behind them respectively, and the executive participation and interaction within the exercise of power. Only properly shaped relationships, based on the principles set out in the definition, are able to ensure the efficient implementation of the tasks of state.

Those principles that should organize the process of governance, are [The concept… 2008, p. 9]:

- openness, involving the widest public access to information and in particular the information on planned activities, the results of initiatives (primarily government and administration) and on the anti-corruption mechanisms supporting transparency of government
- partnership, understood as the participation of society in the process of governance which is building the capacity of institutions working to create mechanisms for partnerships, the development of administrative competence to interact with the public in carrying out public duties and to stimulate the potential of social actors to interact and cooperate with the administration and government
- accountability relating to the political responsibility for the conduct of public policies which will enable the establishment and functioning of democratic mechanisms, as well as the possibility of making an objective assessment of their effectiveness and efficiency, thus ensuring a clear division of responsibilities in implementing the tasks of state
- effectiveness and efficiency which mean building and strengthening the state capacity at each level of performance of its functions, and thus the government, administration and society
- consistency in ongoing tasks of the state, requiring a construction of coordination mechanisms in all dimensions in which state functions are performed.

Good governance in a commune as a factor of its development

Good governance is an essential precondition for sustainable development. Various countries that are quite similar in terms of their natural resources and social structure have shown a strikingly different performance in improving the welfare of their people. Much of this is attributable to standards of governance. Poor governance stifles and impedes development. In countries with a prevailing corruption, poor control of public funds, lack of accountability, abuses of human rights and excessive military influence, the development inevitably suffers. An element of good governance that is needed for sustained development is an economy that operates in an ethical, accountable and appropriately regulated environment, which facilitates competition in the marketplace. Without this, there will be no urge for economic growth and the sustainable development will not be possible. A dynamic private sector, operating in a properly functioning competitive market system, creates jobs and income, generates wealth and helps ensure that resources are used efficiently.

Key elements of good governance in the public administration as well as in local government units are outlined below [Good… 2000, pp. 3-5].

- Political principles:

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- good governance is based on the establishment of a representative and accountable form of government
- good governance requires a strong and pluralistic civil society with freedom of expression and association
- good governance requires good institutions, sets of rules governing actions of individuals and organisations and the negotiation of differences between them
- good governance requires the primacy of the rule of law, maintained through an impartial and effective legal system
- good governance requires a high degree of transparency and accountability in public and corporate processes; a participatory approach to service delivery is important for public services to be effective.

- Economic principles:
  - good governance requires policies to promote broad-based economic growth and dynamic private sector as well as social policies that will lead to poverty reduction; the economic growth is best achieved in an efficient, open, market-based economy
  - investment in people is a high priority, applied through policies and institutions that improve access to quality education, health and other services that underpin a country's human resource base
  - effective institutions and good corporate governance are needed to support the development of a competitive private sector; in particular, for markets to function, social norms are needed that respect contract and property rights
  - careful management of the national economy is vital in order to maximize economic and social advancement.

Good governance in a Polish municipality should be based on the fundamental principles established by the Ministry of Regional Development, as well as on solid and effective relationships with others. Therefore, a correct relationship with all stakeholders gives the commune a possibility of efficient functioning and development. In recognition of the municipality's`activities and application of the principles laid down in the concept of good governance, the unit may achieve a title of an intelligent commune. Approaching and formulating a definition of an intelligent commune, it can be defined as a unit creating value through nurturing and managing relationships with its partners. The management in an intelligent commune can be described as an Interorganizational Relationship Management (IORM). IORM should be defined as a process of planning, organizing, encouraging, developing, and nurturing climate of cooperation ties between the municipality and its residents, local partners and prospective investors. Its consequences will inculcate mutual understanding and trust as well as respecting the rights of each party in accordance with its established roles in the market and society.

Groups that municipality must accept as its partners are [Wereda 2010, p. 15]:
- recipients of public services offered by the municipality, or municipal area residents, companies operating within it, and tourists using the services of the municipalities in the short term
- providers of services or products used by the municipality, such as banks or subcontractors for products and services to the construction of technical and social infrastructure, etc.
- competitors, or any other municipality and city located in the vicinity

- prospective recipients of public service who intend to establish themselves in areas of the municipality (individuals and investors).

The use of competitors as partners, an efficient allocation of municipal resources (land, capital and labour) as well as a good governance in the short and medium term may introduce the municipality into the stage of sustainable development. This development will result in the gaining a competitive advantage over other 'less intelligent' communes in the sub-region. Factors determining the advantage of an intelligent commune in the region, in addition to efficient financial management (capital resources) mainly include [Wereda 2010, p. 18]:

- good relationships and transfers of values with partners
- efficient use of territory governed by the municipality (land resource) and its workforce (job resource)
- developing a marketing image of the municipality (including a good brand)
- promotion of the municipality
- use of the latest relevant techniques and technologies and maintenance of relationships with partners
- effective governance by good people professionally prepared for the job and educated in the field of public management
- treating customers and other municipalities as partners and not as supplicants (an increase of service quality to each group of interest).

According to the concept of the Independent Commission on Good Governance in Public Services located in London there are six core principles of good governance, each one accompanied by its supporting principles:

- good governance means focusing on the organisation's purpose and on outcomes for citizens and service users (being clear about the organisation's purpose and its intended outcomes for citizens and service users; making sure that users receive a high quality service; making sure that taxpayers receive value for money)
- good governance means performing effectively in clearly defined functions and roles (being clear about the functions of the governing body; being clear about the responsibilities of non-executives and the executive, and making sure that those responsibilities are carried out; being clear about relationships between governors and the public)
- good governance means promoting values for the whole organisation and demonstrating the values of good governance through behaviour (putting organisational values into practice; individual governors behaving in ways that uphold and exemplify effective governance)
- good governance means taking informed, transparent decisions and managing risk (being rigorous and transparent about how decisions are taken; having and using good quality information, advice and support; making sure that an effective risk management system is in operation)
- good governance means developing the capacity and capability of the governing body to be effective (making sure that appointed and elected governors have the skills, knowledge and experience they need to perform well; developing the capability of people with governance responsibilities and evaluating their performance, as individuals and as a group; striking a balance, in the membership of the governing body, between continuity and renewal)

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- good governance means engaging stakeholders and making accountability real (understanding formal and informal accountability relationships; taking an active and planned approach to dialogue with and accountability to the public; taking an active and planned approach to responsibility of staff; engaging effectively with institutional stakeholders).

Zbuczyn commune, a local administrative unit using good governance in its public activity in the sub-region

Zbuczyn commune is located in the eastern part of the Mazowieckie voivodeship, in Siedlce district, and bordered by seven municipalities in four districts. Commune's geographic axis runs from east to west along the national road no. 2 linking Warsaw with Terespol, the main country's East-West highway. At a distance of about 5 km north of the existing national road no. 2 the future motorway A-2 on route Berlin – Swiecko – Poznan – Warsaw – Terespol – Moscow is located. Zbuczyn Commune is a municipality with a rural status and the local authority is situated in Zbuczyn. It occupies an area of 211 km^2 (which represents 0.59% of the Mazowieckie voivodeship area) and is the largest rural commune in the district of Siedlce.

The population of the community, according to the Office of Zbuczyn Commune, on 31st December 2007 was 10 145 people (registered permanent residents) which represents 0.19% of the voivodeship's population.

Competitive advantage of Zbuczyn commune in the long term largely depends on its location, social relations, and proper allocation of financial resources, property and information. The commune is not very densely populated and not a large number of companies is situated there, but because of its natural features, tourism and partnership relationships with all stakeholders it is a unit attractive for both the society and investors [Zbuczyn… 2008, pp. 11-13].

The municipality since 2002 has been governed by the same mayor, Roman Prochenka, who is an educated person, twice chosen by people in free elections to represent their local unit. In 2004, mayor and the Municipal Council have appointed a team to prepare the Zbuczyn Municipal Development Strategy for the years 2008-2015. In this document, one can see a lot of ideas and themes from the concept of good governance.

The mayor and the Municipal Council creating the strategy focused on assessment of internal resources as well as commune's strengths and problems, by adopting the definition of external constraints associated with the geographical location, the existing legislative system in Poland, the level of economic development and the state of public finances. During the debates the five key areas of the commune's strategy have been analyzed:
- municipal finance
- infrastructure
- economic development (including agriculture and tourism)
- education, culture and sport
- health, social welfare and public safety.

On the basis of this analysis, the objectives and directions of Zbuczyn commune development were defined, with the aim of improving its situation in the sub-region in

accordance with the concept of good governance, which was confirmed by the commune's authorities in a series of direct interviews. The following objectives are outlined below.

Objectives and directions in the Zbuczyn community development

Long-term social and economic policies within the community are based on several basic assumptions:
- maintenance of the agricultural character of the community at large
- development of a transit traffic service infrastructure, particularly roads
- creation of conditions for the growth of wealth belonging to the population of community and a skilful adaptation to the EU regional policy
- conservation of resources and values of natural and cultural environment
- development of infrastructure in areas eligible for the development of light industry, services, recreation and tourism
- development of entrepreneurship among the residents.

The basic directions of further development of the community include [Zbuczyn... 2008, p. 12]:
- restructuring of agriculture through the development of large and medium-size farms
- development of units involved in support for agriculture
- enlargement of areas for investments in services, mainly at the national road no. A2 Warsaw – Terespol, in the near future also at the planned highway;
- development of infrastructure for transport, telecommunications and electricity supply
- arrangement of water, waste water and solid wastes management, conveying gas to the commune and construction of a local gas distributing network
- development of tourism and recreation activities in selected areas
- improving housing conditions through the development of a local master plan for areas allocated for this purpose together with associated services
- promotion of cultural and natural values of the community
- promotion and development of tourism and agro-tourism
- improvement of spatial order within the commune
- creation of conditions for emerging possibilities of new jobs for people leaving agriculture.

Unfortunately, the Zbuczyn commune in order to continue its development must eliminate many barriers and problems in its area. Accordingly, the local authorities have proposed measures in accordance with the idea of good governance that can help to achieve a sustainable development and a status of intelligent municipality by the Zbuczyn commune [Good... 2000, pp. 8]:
- strengthening of key agencies responsible for economic policy, planning and public sector financial management, including finance ministries, treasury departments and commercial banks

- helping partner regional and local governments strengthen their trade policies and procedures, participate in regional and global trading arrangements, and promote trade and investment opportunities in regions
- promoting more clearly defined property rights through legal and administrative reforms
- helping partners of local governments create an efficient and equitable taxation system, the one that enables government to properly fund public services and income transfers to the poor but, at the same time, does not act as a barrier to private sector development in the regions and in the country
- strengthening the banking sector and financial markets in the process of giving priority loans to local government units
- improving corporate governance and local governance by helping to establish appropriate legal, institutional and regulatory frameworks
- supporting the development of microenterprises and small/medium enterprises in the communes; this can be done through a variety of means, for example by helping local government to create an appropriate regulatory environment, by developing business skills and knowledge, and by promoting improved access to financial services and other business services
- improving delivery of basic services, such as health care, education, water supply and sanitation, by public and private sectors
- strengthening the rule of law and improving legal systems, including central regulatory bodies
- promoting respect for human rights and strengthening democratic processes, civil representation and participation in the local areas
- improving public administration generally; a competent and effective public sector is needed to implement reforms effectively and to ensure efficient delivery of public services to the lower government units.

Conclusions

When we talk about local government units, i.e. communes, it is sometimes hard to describe the management style practised by their authorities. That is why, because of the uniqueness of communes, it is important to implement the concept of good governance.

Governance reforms should be seen as a lengthy process of continuous improvement, which goes beyond introducing new systems, but requires new skills, attitudes and organizational cultures. A sustainable institutional change requires a careful selection of desired interventions, a gradualist approach to implementation and a long-term support. Secondly, leadership of the reform process is indispensable. Without institutional champions who actively support the reform implementation, it is difficult for reform efforts to succeed. Thirdly, a promotion of local participation and ownership by the governance reforms is crucial to the credibility and sustainability of reforms. It is important to take into account the political and administrative culture and traditions. An informed understanding of the broad institutional environment is necessary and the expatriate advisers need to be sensitive to the local situation, to ensure that the pace of change is appropriate and that local ownership is not lost. Furthermore, a comprehensive approach to the reform in

collaboration with other local and regional partners is preferable to fragmented, piecemeal activities. In the fifth place there are realistic targets which need to be set. It usually pays to be modest rather than overambitious. An appreciation of the extent of local capacity to support reform is also essential. If capacity is low, rapid reform will not be sustainable. Assessing this capacity can often be difficult. Next is the position of expert advisers. In an area as sensitive and important as local governance, it is important to use high-level, very experienced senior advisers who are the best in their field and support the young ones [Good… 2000, pp. 11-12].

What is more, a flexible approach is needed. Means for reaching identified objectives, and even the objectives themselves, may need to be modified or adapted quickly to changing circumstances. Local principles and values need to be balanced carefully with partner circumstances and needs too. Finally, it is important to involve the private sector, the community sector and the general public in governance initiatives. Nowadays, the role of government is a crucial one, but it is important not to neglect the other sectors of society.

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Internationalization of agro-food trade in the Visegrad Group countries after their entering into the European Union

Abstract. The foreign trade performance in agro-food sector in the Central European Countries for the period of 2004-2007 has been evaluated. The main exports and imports measures, comparative advantages, specialization as well as market shares and competitiveness have been analyzed. After entering into the European Union by the Central European Countries, the importance of foreign trade in agro-food sector has increased, an intra-branch trade has been intensified and its structure has changed. The comparative position of these countries in the trade has been created by rising comparative advantages of some sections and lowering of the others. The foreign trade turnover has risen and the agro-food trade has been internationalized.

Keywords: internationalization, agro-food trade, competitiveness, comparative advantage, market share, trade specialization, trade concentration.

Introduction

The processes of trade liberalization and changes in the global trade policy principles have exerted an influence on the growth of economic cooperation in the world as well as on alteration of development conditions of commerce. For several years already, the Visegrad Group countries have participated in the free trade in the EU common market. The Czech Republic, Poland, the Slovak Republic and Hungary have been aiming at consolidating their hold on trade in different economic branches.

The main aims of the paper are a comparison of foreign trade position of agro-food sector in the new EU member states and an evaluation of the process of internationalization. The ex post evaluation of the international trade position of agro-food sector and the intensification of foreign trade in the branch have been provided.

The available OECD's branch and product item statistics have been analyzed. The annual data on the merchandise trade in the main agro-food products, i.e. cereals, live animals, meat and edible meat offal as well as products of mill industry in years 2004-2007 have been compiled.[2] The measures of volume and dynamics of trade revealing the comparative advantages, participation in foreign markets, and trade concentration have been compared. The foregoing research has attempted to examine the international position and competitiveness of the Central European Countries in the agro-food trade as well as the changes in their involvement in international agro-food markets after their entering into the EU.

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Methodological remarks

Internationalization is commonly understood as a rise in importance of foreign trade in the economy as well as an involvement of enterprises in international markets. The main measures of the process of internationalization are foreign trade balance and turnover. The trade turnover specifies the volume of trade and enables to measure the input of foreign trade in economy. The trade balance is defined as a difference between exports and imports in a given time. It informs about trade balance deficit or surplus. The trade balance surplus which is an export surplus is called net export; the trade balance deficit which is an import surplus is identified as a net import. The values of the mentioned measures show the level of economic openness to the foreign trade and the international position of economy. The trade balance informs also about the intra-trade within a branch [Durand & Giorno 1987].

There are a few methods to assess a competitive position in the international markets. Several indicators have been specified in the OECD's statistics to measure a commercial activity of the economy. The revealed comparative advantage (RCA) identifies the intensity of trade specialization of a country within a region or the world. It is calculated as the ratio of the share of a given product in country's exports to another country or region to the share of this product in the world's total exports (equation 1). If the RCA takes a value less than 1 this implies that the country is not specialized in exporting the product. The share of that group within the total exports of goods of this country is less than the corresponding world share. Similarly if the index exceeds 1 this implies that the country is specialized in exporting this type of goods [Balassa 1965].

$$(1) \quad RCA_i = \frac{x_{ij}}{X_j} \div \frac{x_{iw}}{X_w},$$

where: x_{ij} – exports of commodity i of country j, X_j – total exports of country j, x_{iw} – world exports of commodity i, X_w – total world exports.

For the calculation of the export performance of merchandise trade, the growth rate of total exports of goods from a particular OECD country has been subtracted from the growth rate of imports (of this category of goods) in the rest of the world. If the exports growth rate of a single country is higher than the growth rate of imports in the rest of the world, then the export performance of this country for this type of goods is greater than 1.

The export market share by type of goods is calculated by dividing exports of respective type of goods from the country by world exports of this type of goods (expressed as a percentage in the database). The indicator measures the degree of importance of country's exports of a specific type of goods for the total world exports of this type of goods.

$$(2) \quad He = (\sum_{i=1}^{n} f_i^2) \times 100,$$

where: n – number of countries of destination; f – export share of i-th country.

The Herfindahl index of geographical concentration for a given country's exports is a sum of squared shares of each country of destination in the total exports of the country (equation 2). If each of the countries of destination received the same export value from the country of dispatch, the Herfindahl index would be equal to 1/n (times 100%), where n is the number of countries of destination. The nearer to 1 (times 100%) is the index, the more geographically concentrated is the trade of this country [OECD's… 2006].

The foreign trade balance in agriculture and food industry

The rate of trade growth changed in years 2004-2007, the balance and the turnover of agro-food trade developed in the Visegrad Group countries. There was only one totally net exporter of agricultural goods among the considered countries. Hungary had a balance surplus of 1708 million USD in 2007. Its export surplus was almost tripled in comparison with 2004. The remaining countries had trade balance deficits. Poland was the biggest net importer of agricultural goods with the adverse trade balance of -1524 million USD. The import surplus was over a hundred percent higher in comparison with 2004 (Table 1).

Table 1. The foreign trade balance in agriculture and food industry in the Visegrad Group countries in 2004-2007, million USD and %

Country	Year							
	2004		2005		2006		2007	
	million USD	%	million USD	%	million USD	%	million USD	%
Agriculture								
Hungary	618	100	610	99	794	128	1708	276
Poland	-755	100	-714	95	-952	126	-1524	202
The Czech Republic	-602	100	-434	72	-673	112	-465	77
The Slovak Republic	-105	100	29	128	-63	60	-202	192
Food industry								
Hungary	785	100	640	82	539	69	628	80
Poland	1482	100	2451	165	3110	210	3504	236
The Czech Republic	-676	100	-746	110	-943	139	-1189	176
The Slovak Republic	-340	100	-459	135	-522	154	-732	215

Notes: agricultural sector includes agriculture, hunting and forestry, food industry sector includes food processing and beverages, according to the International Standard Industrial Classification (ISIC).

Source: own compilations on the basis of OECD statistics [Micro… 2009].

There were two net exporters of foodstuffs in the Visegrad Group in the analyzed period. Poland, Poland the biggest exporter of food, had export surpluses of 3504 million USD in 2007 and the trade grew by 236% since 2004. The surpluses were nearly fivefold of those of Hungary (628 million USD), where the food trade declined by 20% in comparison with 2004. The remaining countries had food trade balance deficits, the Czech Republic of 1189 million USD.

All countries of the Visegrad Group were net exporters of live animals. During the analyzed time three of them: the Czech Republic, the Slovak Republic and Hungary expanded their export surpluses of live animals. Only Polish export surpluses of live animals decreased in the respective time. The same three countries had growing export surpluses in cereals. The highest rate of increase in export surpluses of cereals was recorded in the Czech Republic, but the highest trade surpluses in cereals were gained by Hungary. The trade balance with the world reached 1518.8 million USD and that with the EU 900.6

million USD in 2007. Poland was the only net importer of cereals, with increasing import surpluses which grew in 2007 by 227% in comparison with 2004 (Table 2).

Poland was among the Visegrad Group countries one of the main net exporters of meat and edible meat offal. The trade balance doubled in 2007 in comparison with 2004 and grew up to 1245.6 million USD in trade with the world and to 760.9 million USD in trade with the EU. Hungary, the next net exporter of meat and edible meat offal attained in 2007 almost twice lower export surplus than Poland. The remaining countries, the Czech Republic and the Slovak Republic, were net importers of meat and edible meat offal, with a growing excess on imports side. In comparison with the 2004 year's value of the trade balance deficit, the one in 2007 almost doubled.

Table 2. The foreign trade balance of agriculture and food industry in the Visegrad Group countries in 2004-2007 by the group of goods, million USD

Country	Year							
	2004		2005		2006		2007	
	World	EU-15	World	EU-15	World	EU-15	World	EU-15
Live animals								
Hungary	84.5	50.6	60.1	8.6	53.0	69.9	94.7	71.5
Poland	190.7	136.7	236.6	160.9	320.6	215.5	188.6	119.6
The Czech Republic	95.6	53.5	116.8	77.4	128.4	87.5	158.3	98.2
The Slovak Republic	25.8	35.2	39.8	33.4	59.0	43.8	84.0	58.0
Cereals								
Hungary	363.6	190.0	528.0	343.8	724.7	390.9	1 518.8	900.6
Poland	-178.5	-85.1	54.6	63.1	-47.8	-23.6	-378.0	-193.5
The Czech Republic	13.6	5.9	233.9	140.2	146.2	109.6	233.9	187.3
The Slovak Republic	18.2	9.4	63.8	29.9	151.1	59.6	100.0	58.1
Meat and edible meat offal								
Hungary	515.8	278.5	411.4	168.9	404.8	175.1	574.4	292.1
Poland	479.5	244.9	798.5	393.3	1106.6	644.5	1245.6	760.9
The Czech Republic	-181.0	-121.4	-301.7	-234.5	-362.1	-261.2	-443.5	-348.4
The Slovak Republic	-55.6	-45.5	-113.0	-47.2	-122.3	-44.9	-155.7	-59.1
Products of mill industry								
Hungary	35.8	-3.3	25.8	-1.8	-1.1	-6.8	52.8	-6.9
Poland	-42.3	-40.6	-53.3	-40.6	-74.3	-57.3	-113.2	-73.2
The Czech Republic	77.3	0.8	55.8	-3.0	62.9	1.5	64.8	-2.4
The Slovak Republic	61.4	4.4	75.9	9.0	74.4	7.8	110.5	6.9

Notes: classification by Harmonized System (HS)

Source: own compilations on the basis of OECD statistics [Micro… 2009].

In comparison with the above mentioned, the value of mill industry merchandise trade balance was the smallest one. The only net exporter of mill products, both to the EU and the world, was in 2007 the Slovak Republic, with a balance surplus of 6.9 million USD in trade with the EU and of 110.5 million USD in trade with the world. The Czech Republic

and Hungary gained export surpluses in trade with the world, on the contrary Poland was a net importer of mill products in trade with the world as well as with the EU.

To summarize, after entering the EU the foreign trade balance of agriculture and food industry in the Visegrad Group countries has definitely boosted. One can conclude from this fact that in relevant countries the merchandise trade became more internationally dependent. Hungary and Poland were the leaders in the opening out to the international merchandise trade with growing up export surpluses, in agriculture by increasing exports of cereals and in food industry by expanding meat exports. With respect to imports, the Czech Republic, the Slovak Republic and Poland were importers in agriculture as well as the Czech Republic, the Slovak Republic in food trade. The Czech Republic was the biggest net importer of meat and Poland of cereals.

The comparative advantages and export performance of agriculture and food industry

The average revealed comparative advantage of agriculture and food industry in the Visegrad Group took in 2004-2007 on a value of 0.7 and 0.9 which indicates a low intensity of trade specialization of the group within the OECD. Still, two out of four countries reached the index value exceeding one. They were Hungary with index for agriculture equal 1.1 and Poland for food industry equal 1.6. This implies that these countries were specialized in exporting this type of goods.

Table 3. The revealed comparative advantage and export performance of agriculture and food industry in the Visegrad countries in 2004-2007

Country	Year									
	2004		2005		2006		2007		Average	
	RCA	EP	RCA	EP	RCA	EP	RCA	EP	RCA	EP
Agriculture										
Hungary	1.1	1.0	1.0	1.0	1.0	1.0	1.2	1.4	1.1	1.1
Poland	0.8	1.3	0.8	1.2	0.7	1.0	0.7	1.1	0.8	1.2
The Czech Republic	0.4	1.0	0.6	1.6	0.5	0.9	0.5	1.2	0.5	1.2
The Slovak Republic	0.5	1.4	0.8	1.5	0.7	1.0	0.5	1.0	0.6	1.2
Average	0.7	1.2	0.8	1.3	0.7	1.0	0.7	1.2	0.7	1.2
Food industry										
Hungary	1.0	1.0	0.9	1.0	0.9	0.9	0.8	1.1	0.9	1.0
Poland	1.4	1.3	1.7	1.3	1.7	1.1	1.6	1.1	1.6	1.2
The Czech Republic	0.6	1.2	0.6	1.1	0.6	1.0	0.6	1.1	0.6	1.1
The Slovak Republic	0.6	1.3	0.7	1.3	0.7	1.0	0.6	1.1	0.7	1.2
Average	0.9	1.2	1.0	1.2	1.0	1.0	0.9	1.1	0.9	1.1

Notes: as in table 1.

Source: own compilations on the basis of OECD statistics [Micro… 2009].

The Czech Republic was the least specialized in trade in agricultural and food products, the average RCA was in 2004 and 2007 equal to 0.5 and 0.6 respectively. Although the average RCA of the Visegrad Group was mostly less than one, the export growth rate was higher than the growth rate of imports in the rest of the world, the average export performance of the group for agricultural goods was 1.2 and for food produce 1.1 (Table 3).

Table 4. The revealed comparative advantage and export performance of agriculture and food industry in the Visegrad countries in 2004-2007 by group of goods

Country	Year									
	2004		2005		2006		2007		Average	
	RCA	EP	RCA	EP	RCA	EP	RCA	EP	RCA	EP
Live animals										
Hungary	2.3	1.1	2.3	1.0	2.2	1.0	2.1	1.1	2.2	1.1
Poland	3.0	1.4	3.1	1.0	3.2	1.1	2.1	1.0	2.9	1.1
The Czech Republic	1.4	2.0	1.6	1.1	1.5	1.0	1.4	1.1	1.5	1.3
The Slovak Republic	1.7	1.8	2.1	1.2	1.8	1.0	1.5	1.0	1.8	1.3
Average	2.1	1.6	2.3	1.1	2.2	1.0	1.8	1.1	2.1	1.2
Cereals										
Hungary	1.6	1.0	2.2	1.3	2.5	1.2	3.1	1.5	2.4	1.3
Poland	0.1	0.5	0.5	4.3	0.4	1.0	0.3	0.8	0.3	1.7
The Czech Republic	0.2	0.4	0.8	5.0	0.6	0.8	0.5	1.1	0.5	1.8
The Slovak Republic	0.4	1.1	0.8	2.1	1.2	1.8	0.7	0.8	0.8	1.5
Average	0.6	0.8	1.1	3.2	1.2	1.2	1.2	1.1	1.0	1.5
Meat and edible meat offal										
Hungary	2.0	1.0	1.8	0.9	1.5	0.9	1.5	1.1	1.7	1.0
Poland	1.7	1.2	2.2	1.4	2.5	1.2	2.4	1.1	2.2	1.2
The Czech Republic	0.2	1.6	0.2	1.1	0.2	1.0	0.2	1.2	0.2	1.2
The Slovak Republic	0.3	3.0	0.5	1.7	0.4	0.8	0.3	1.0	0.4	1.6
Average	1.1	1.7	1.2	1.3	1.2	1.0	1.1	1.1	1.1	1.3
Products of mill industry										
Hungary	1.1	0.8	1.0	0.9	0.4	0.4	1.0	2.7	0.9	1.2
Poland	1.1	1.1	1.0	1.0	0.8	1.0	0.7	1.1	0.9	1.1
The Czech Republic	1.7	1.2	1.3	0.8	1.3	1.0	1.0	1.0	1.3	1.0
The Slovak Republic	2.8	0.9	3.2	1.2	2.8	1.0	2.5	1.1	2.8	1.1
Average	1.7	1.0	1.6	1.0	1.3	0.9	1.3	1.5	1.5	1.1

Notes: as in table 2.

Source: own compilations on the basis of OECD statistics [Micro… 2009].

Broadly speaking, the Visegrad countries specialization in food trade was stronger than in agricultural trade. Contrary to the whole branch statistics, the main products statistics showed the highest specialization in live animals exports. The highest advantage was gained for live animals. It reached 2.1, then for mill products 1.5, for meet 1.1 and for

cereals 1.0. The RCA above the group average was achieved for live animals in Polish trade (2.9) and in Hungarian (2.2); for mill products in Slovakian trade (2.8); for cereals in Hungarian trade (2.4) and for meat in Polish trade (2.2). The average RCA was for each analyzed category of goods equal or higher than one. The figures revealed that the group had an advantage in main agricultural and food industry commodities (Table 4).

To sum up, the Visegrad countries had in agricultural and food merchandise in 2004-2007 on the one hand a low export orientation, on the other hand there were potential capacities to expand the production and exports of agro-food products. Especially in years 2005 and 2006, the mentioned countries succeeded in export expansion in different categories of agricultural and food goods. In terms of agro-food merchandise trade the countries referred to had comparative advantage in particular products and a high excess of animal and mill product exports over imports. The average agro-food export performance of the group surpassed the world import performance. The figures indicate that there was an apparent increase in intra-branch cooperation between the Visegrad Group and the EU after the accession. There are grounds for supposing that the international position of the analyzed countries in the agro-food trade may possibly strengthen in the future as well.

The export concentration and market share of agriculture and food industry

Table 5. The share of agriculture and food industry foreign trade of the Visegrad Group countries in the OECD market in 2004-2007, %

Country	Year				2004=100	Average
	2004	2005	2006	2007		
Agriculture						
Hungary	0.7	0.6	0.6	0.9	129	0.7
Poland	0.6	0.7	0.7	0.8	133	0.7
The Czech Republic	0.3	0.5	0.4	0.5	167	0.4
The Slovak Republic	0.2	0.3	0.2	0.2	100	0.2
Average	0.5	0.5	0.5	0.6	120	0.5
Food industry						
Hungary	0.6	0.6	0.5	0.6	100	0.6
Poland	1.2	1.5	1.6	1.7	142	1.5
The Czech Republic	0.4	0.5	0.5	0.5	125	0.5
The Slovak Republic	0.2	0.2	0.2	0.3	150	0.2
Average	0.6	0.7	0.7	0.8	133	0.7

Source: own compilations on the basis of OECD statistics [Micro… 2009].

Generally speaking, the share of agro-food exports of the Visegrad countries in the OECD's markets was very small. The share in agricultural market in 2004-2007 was on the average 0.5%, in food market 0.7%. Two out of the analysed countries, namely Hungary and Poland, had the market share above the average, in the agricultural market 0.7% each and in the food market 0.6% and 1.5% respectively. On the other hand, the smallest share in the agro-food OECD market had the Slovak Republic (0.2%) (Table 5).

The average growth of market share in food exports was in 2004-2007 higher than the one in agricultural exports. The indices reached respectively 133% and 120%. The highest growth was reached in that respect by the Slovak Republic (150%) and the Czech Republic (167%). The exports of Slovakian food rose rapidly, but the agricultural exports were stagnating. Poland was the only country out of the Visegrad Group whose market share was been growing at a pace above the average in both agricultural and food markets.

Table 6. The geographical concentration and share in the world market of agriculture and food industry in the Visegrad Group countries in 2004-2007 by group of goods, %

| Country | Year | | | | | | | | Average | |
| | 2004 | | 2005 | | 2006 | | 2007 | | | |
	MS	He	MS	He	MS	He	MS	MS	He
Live animals										
Hungary	1.5	0.2	1.4	0.2	1.4	0.1	1.5	1.5	0.2
Poland	2.5	0.3	2.8	0.2	3.0	0.2	2.2	2.6	0.2
The Czech Republic	1.1	0.1	1.2	0.1	1.2	0.1	1.3	1.2	0.1
The Slovak Republic	0.5	0.2	0.7	0.2	0.7	0.1	0.7	0.7	0.2
Average	1.4	0.2	1.5	0.2	1.6	0.1	1.4	1.5	0.2
Cereals										
Hungary	1.0	0.1	1.3	0.1	1.6	0.1	2.3	1.6	0.1
Poland	0.1	0.2	0.4	0.2	0.4	0.2	0.3	0.3	0.2
The Czech Republic	0.1	0.2	0.6	0.3	0.5	0.3	0.5	0.4	0.3
The Slovak Republic	0.1	0.2	0.2	0.1	0.4	0.2	0.3	0.3	0.2
Average	0.3	0.2	0.6	0.2	0.7	0.2	0.9	0.6	0.2
Meat and edible meat offal										
Hungary	1.3	0.2	1.1	0.1	1.0	0.1	1.1	1.1	0.1
Poland	1.4	0.1	2.0	0.1	2.3	0.1	2.5	2.1	0.1
The Czech Republic	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
The Slovak Republic	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2
Average	0.8	0.2	0.9	0.2	0.9	0.2	1.0	0.9	0.2
Products of mill industry										
Hungary	0.7	0.2	0.6	0.1	0.3	0.2	0.7	0.6	0.2
Poland	0.9	0.1	0.8	0.1	0.8	0.1	0.8	0.8	0.1
The Czech Republic	1.2	0.2	1.0	0.2	1.0	0.2	1.0	1.1	0.2
The Slovak Republic	0.9	0.1	1.0	0.1	1.0	0.1	1.1	1.0	0.1
Average	0.9	0.2	0.9	0.1	0.8	0.2	0.9	0.9	0.2

Source: own compilations on the basis of OECD statistics [Micro… 2009].

With respect to the analyzed categories of goods, the highest average share of Visegrad countries in the world export market was reached in the live animals market (1.5). Poland participated in this market in 2.6%, in the meat market in 2.1%. Hungary reached high levels of participation in the live animals market (1.5%), the cereals market (1.6%) and the meat market (1.1%) (Table 6).

The Herfindahl index of geographical concentration for a given country's exports, with regard to analyzed categories of goods was very low, the average value was 0.2. The trade partners were scattered, the pattern of trade was dominated by many trade partners, which means that the analyzed countries were not dependant on one country market.

To reassume, both the market share as well as the market concentration of the agro-food exports were for the Visegrad Group in 2004-2007 very small. The countries were not specialized in agro-food exports, the world market shares were rarely over 2%. The merchants in these countries cooperated with many partners trading small amounts of analyzed categories of goods with each of the cooperators. In terms of foreign trade advantages, a diversification of foreign markets was very important for these countries. A high geographical concentration of exports could have given rise to some perturbations because of depending on the only one partner demand. On the other hand, a concentration of exports may have resulted in lower transactional and transportation costs.

Conclusions

On the basis of the above analysis, we may conclude that entering by the Visegrad Group countries into the EU gave a substantial impulse to the development of their foreign agro-food trade in the European and the world markets. The average value of trade balance in the group doubled in the analyzed years. Hungary was the leading exporter of the agricultural products and it was Poland for the food products. After the EU accession, the mentioned countries relevantly expanded their exports which tripled or doubled. One can consider that there are strong chances of further internationalization of agro-food trade and participation in the international specialization and division of labor. The Czech Republic and the Slovak Republic increased their net agro-food imports. Their international trade position was weaker in this respect and it was threatened in the future.

The contribution of the Visegrad countries to the foreign agro-food markets was gradually extended and averaged around 1% of the world market. The leading shares had the Hungarian and Polish exports. The analyzed countries reached the highest participation in the meat market. Animal and meat products were strategic groups in the analyzed agro-food exports. Anyway, most of the exports consisted of animal and cereal raw materials. The raw material content of agro-food exports weakened the trade position and lowered the profit margin.

To conclude, the analyzed countries boosted up their international positions by increasing exports and imports of agro-food products. The trade balance surpluses proved there was an increase in intra-trade and an ability of the branch to compete with foreign producers. It can be anticipated that the tendency of growing shares in foreign markets will be stable as a result of the increasing competitiveness of agro-food production. The main indication is the existence of revealed competitive advantages conditioned on introduction of an appropriate strategy of expansion by the agro-food sectors in the EU newcomers.

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LOCAL GOVERNMENT PERFORMANCE AND SPATIAL DEPENDENCIES: DRIVERS OF STRUCTURAL SUPPORT ALLOCATION?[3]

Abstract. A central aim of the Regional Policy of the European Union is a regional cohesion. Major instruments are regional policy programs financed via various European funds. The allocation of regional policy funds varies dramatically across regions even when one controls for regional development indicators. Thus, what political economy factors determine the access to financial support of regional policy funds? With this regard, the paper highlights the role of local government performance. Beyond, it is tested for spatial dependencies, e.g. if knowledge spillovers determine the ability to capture regional funds. Pars pro toto empirical analyses focus on the allocation of SAPARD funds in Slovakia using cross-section as well as panel data. The government performance is measured as a technical efficiency of local public good provision and derived within a non-parametric DEA approach. Results show that the government efficiency has a positive significant impact on the structural funding allocation. Furthermore, spatial dependencies occur. With respect to the program duration, it is concluded that knowledge spillovers take place, supporting a successfully program participation.

Key words: regional policy, government performance, spatial econometrics, SAPARD.

Introduction

The European Union is characterized by a coexistence of intra- as well as international disparities. By enlargements of the EU from 6 member-states in 1957 to the current 27, this situation got worse, whereas especially the eastern expansion of the EU led to an intensification of differences. Therefore the Regional Policy of the EU aims to strengthen the economic, social and territorial cohesion by reducing disparities in the level of development among regions and member states. To achieve the objectives of convergence, regional competitiveness and employment, the European territorial cooperation structural programs and funds have been established. However, allocation of regional policy funds vary dramatically across regions even when one controls for regional development indicators. Thus, a question arises, what other political economy factors beyond regional development levels determine the access to the financial support of regional policy funds?

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Which components describe the amount of money regions receive? And in respect to the strengthened decentralisation of program implementation: how important is the performance of local governments to participate successfully in regional development programs? In other words: how important is good governance at the regional level to support local agents and what impact does the institutional setting have for the development and performance of the agri-food sector? Furthermore, beyond the capacity of local governments to coordinate, a collective action within their community's knowledge spillovers from other communities might determine local government's ability to capture regional funds. So, do spatial dependencies occur in respect to a successfully project participation? Moreover, the co-financing character of some structural programs supports the importance of localisation in respect to finding a contact with qualified partners. This paper aims therefore to examine to what extend the received structural funds are determined by the government performance as well as by spatial dependencies, in particular by knowledge spillovers among districts. The subject of investigation is a special accession programme for agriculture and rural development SAPARD, which was one of the pre-accession instruments for the Central and Eastern European member-states.

The paper is structured as follows. The SAPARD programme is introduced first with its objectives, measures and funding rules before possible determinants of accessibility to structural spending are deduced. The methodologies of receiving the technical efficiency measures as well as for taking care of spatial dependencies are explained before the estimation settings are described. Next, the estimation results are presented and discussed before a conclusion finishes the paper.

Structural funding: the example of SAPARD

SAPARD was established in 1999 on the basis of proposals within the Agenda 2000 for the period 2000-2006 and was characterized by three priorities and by 15 eligibility measures. The general aim was to assist accessing countries in the structural adjustment of their agricultural sectors and rural areas, as well as in the implementation of the acquis communautaire concerning the Common Agricultural Policy and related legislation. For an improvement and guidance of program implementation, a multi-annual programming approach with priority setting and continuous monitoring and evaluation was introduced. The basis of an financial allocation were the farming population, the agricultural area, the gross domestic product and the specific territorial situation.

In comparison with other pre-accession instruments, SAPARD was conspicuous because of its decentralized management by implementing agencies in the beneficiary countries. So, institutions were allowed to acquire the responsibility for program management and to build an internal expertise and capacity to implement, monitor and evaluate programs. This decentralisation allowed for a support of small projects which guaranteed that the share of local contracts exceeded the share of international public invitations. A dualism of measures and investments in a region took place with the aim to enforce induced positive regional effects. Furthermore, the decentralization implicated that the European Commission was not involved in the management of SAPARD in the beneficiary countries, apart from project ex-post controls. Ex-ante and mid-term evaluations were in responsibility of the programme managing and payment authority [Regional… 2010]. All in all, the sole responsibility for selecting and managing projects,

arranging finance and carrying out controls reflects the importance of local institutions in respect to a successful SAPARD implementation. Especially, since a partnership principle was pursued increasingly, meaning to include and involve regional and local authorities as well as economic and social partners at all stages, the local authorities gained in importance. Apart from coordination, they could assist in the development plan formulation, which was a pre-condition of participation in a regional development program. The SAPARD was co-financed, meaning that a minimum requirement for participation of the accessing states accounted for 25%, and bilaterally organized, i.e. a Multi Annual Financial Agreement (MAFA) and Annual Financial Agreements (AFA) had to be arranged, whereas the MAFA laid down the framework for co-operation and included the provisions for delegating the management of the programs to the applicant countries. Also financial control rules, monitoring and evaluation requirements and rules for the coordination with other instruments were recognized; this additionally strengthened the importance of the local agencies in respect of successful project participation.

Determinants of structural funding: the example of SAPARD in Slovakia

In this study Slovakia, as one of the new member-states, has been chosen as an object of investigation, regarding LAU 1 (rural community) level regions. The database originates from the Slovak Statistical Office and was set up for a project 'Advanced Eval' which was one of the sixth framework programmes of the EU. During the period 2000-2006, SAPARD had a usable financial support from the Community budget amounting to over half a million euro (€) per year. In case of Slovakia 947 programs were accredited, of which 905 have been realized. Around 4.617 million Slovakian korunas (SKK) (112 million €) have been allocated, whereas the distribution of SAPARD funding between the Slovakian regions differs clearly. The highest amount was allocated in the case of Nitra region, with 6.2 million €, whereas the lowest spending received the Poltar region, with 2600 €. The distribution per population differed, from 0.11 € per capita in Poltar to 65.46 € per capita in Detva region.

The allocation of the SAPARD payments clearly varied across regions (Figure 1). The farming population, the agricultural area, the gross domestic product and the specific territorial situation were in general a basis of the financial allocations from SAPARD. In case of Slovakia the measures M1 (investment in agricultural holdings), M2 (improving the processing and marketing of agricultural and fishery products), M4 (development and diversification of economic activities) and M7 (land improvement and re-parcelling) received the highest funding amounts. But regional development indicators such as the agricultural area or the farming population cannot explain the variances in SAPARD funding in total. Moreover, beyond a clearly differing regional distribution of the agriculturally used area (Figure 2), low correlations of 0.04 and 0.02 between the SAPARD payments per head of population and the farming population or the agricultural area indicate a lack of explanation. Thus, other political economy factors might have determined the access to financial support from SAPARD.
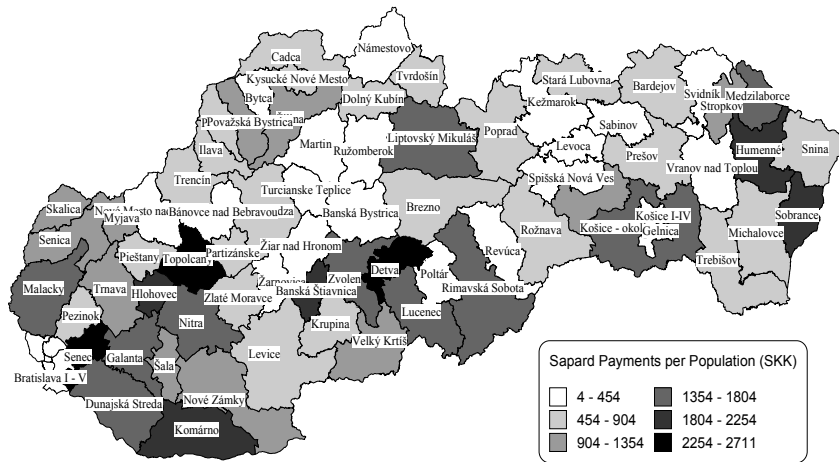
Fig. 1. SAPARD payments in total per head of population, SKK

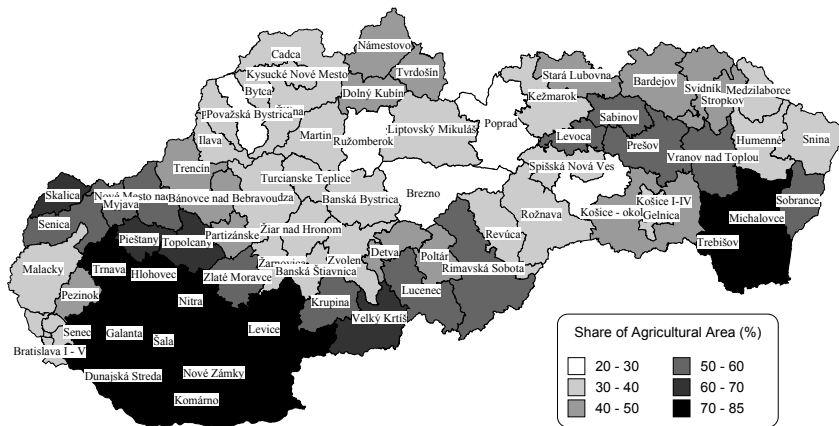Source: own research, Slovakian census data.

Fig. 2. Share of area used for agriculture, %

Source: own research, Slovakian census data.

Therefore, different determinants of the SAPARD funding were taken into consideration. In respect to the payment shares attributable to individual measures and the general focus of the program, agricultural and local governmental structures as well as different socioeconomic measures should be recognized. The agricultural structure was included into the investigations, represented by the employment share of the agricultural sector (Empagr) and by the share of area used for agriculture (Agrarea). The local governmental structures are captured differently. On the one hand, by the number of agencies per population (Adm), whereas a high density is perceived as helpful for the formulation of development plans, on the other hand by the technical efficiency of local governments (TechEff) in respect to the success of submitted development plans. As

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socioeconomic measures, the average-income (Avinceur), the net-migration (Netmig), the degree of privatization (Privatization), the spare-time facilities (Spattime) and the average age (Mage) of inhabitants were chosen. In this way, the average income is recognized in respect to the co-financing principle; so it is assumed as a proxy for the easier management of co-financing. The spare-time facilities are seen as a form of social capital. Their supporting character for plan formulation as well as for gaining partnerships and co-financing management is assumed. The net migration is recognized as an indicator of a favourable regional amenity structure or a regional quality of life. However, although this might be a very vague measure life quality, it is included in the investigations in respect to the purpose of regional policy. The degree of privatisation is measured by the share of privatized enterprises. This serves as a test if the share of enterprises in private ownership has an influence on a successful program participation. Respectively the formulation of partnerships might be positively linked with a higher degree of privatization. In the next section methods for receiving a local government performance and to test for spatial dependencies are introduced before the estimation results are given and discussed.

Local government performance

When understanding local politics basically as the provision of public services, the governmental performance can be interpreted as a technical efficiency of local production of public goods. Following this idea, a non-parametric data envelopment analysis (DEA) was applied to estimate the local government performance in rural communities in Slovakia. DEA models have been used differently in the literature; among other purposes also for analysing the efficiency terms of economic development of cities [Charnes et al. 1989; Data… 1994]. The advantage of deploying DEA methodology is that it measures multidimensional relationships among several inputs and outputs without an a priori functional form assumption [Zhu 2001]. In this study inputs are the factors that the local governments are able to influence as well as the given local conditions; outputs are thereby produced public goods and related amenities. The number of inputs and outputs is chosen according to Dyson et al. [2001] and in respect to the given database. It has been taken care for non-negativity as well as for changing the direction of undesirable outcomes. The relative efficiency measure is scaled so that it ranges between [0, 1]. Each Decision Making Unit (DMU) j has multiple inputs $x_{i,j}$ and multiple outputs $y_{k,j}$; u and v are weights (Equation 1).

$$Efficiency = \frac{\sum_k u_k y_{k,j}}{\sum_i v_i x_{i,j}} \qquad (1)$$

By this each DMU j_0 is allowed to set its own weights. The optimization problem (Equation 2) is given as the efficiency of DMU j_0 is maximized subject to the condition that all efficiencies of other DMU's remain less than or equal to 1. By this the denominator is fixed to a constant value, e.g. 1.0, which can be interpreted as setting a constraint on the weights v_i [Kalvelagen 2002]:

$$\max u, v \sum_k u_k y_{k,j0}$$
$$s.t. \sum_i v_i x_{i,j0} = 1$$
$$\sum_k u_k y_{k,j} \leq \sum_i v_i x_{i,j} \forall j \qquad (2)$$
$$u_k, v_i \geq 0$$

In this study the DMUs are 72 rural communities (LAU1) in Slovakia, called 'okres'. The estimations are conducted for the years 2002-2004, whereas the time-period is related to the phase the majority of SAPARD payments took place. As DEA inputs, the sizes of income, employment, agricultural area as well as the share of forest and water area in total area, the share of built-up area and the unemployment payments per person unemployed were recognized as a proxy for the regional budget conditions. In order to receive a more complex description of the production outcomes, the factor analyses were applied to reduce the number of outcome variables and to classify them by detecting the structure in their relationships. Thus, as outputs the basic and daily technical infrastructure, the social infrastructure, the city life amenities, the economic structure and the environmental quality were used.

Spatial dependencies in structural funds allocation

Beside the importance of the local government performance, the spatial location of a region might be also an important factor for the structural funds allocation. It is thinkable that the amount of received SAPARD payments depends on the region itself as well as (in part) on the neighbouring regions. The existence of spatial hierarchical relationships, spatial spillovers and other types of spatial interactivity are an intuitive motivation for this. In a more general way, a spatial dependence was assumed between observations which were set in spatial or in spatial and temporal order. The spatial dependence exists as a functional relationship between occurrences in one region and occurrences elsewhere, whereas two forms of dependencies can exist. One obvious cause for them is a spatial spillover in measurement errors. The second factor follows from the importance of space as an element in structuring explanations of human behaviour, i.e. from that the location and distance matter and result in a variety of interdependencies in space and time [Anselin 1988].

To deal with spatial dependencies, different possibilities exist. In what follows, a spatial lag, respectively a spatial autoregressive model and a spatial error model will be introduced as well as a combination of both a spatial lag model and a spatial regressive error term. A common idea is that in a cross-sectional setting with N observations, there is insufficient information to estimate a N by N covariance matrix directly from the data, so in general it will be necessary to impose a structure on the covariance. This can be done by using a positive N by N spatial weights matrix W, whereas the elements of the weights matrix are based on the geographic arrangement of the observations, or the contiguity. By this, different specifications of the spatial weights are possible, e.g. weights are non-zero in case two locations share a common boundary, or in case they are within a given distance of each other. In this study, a first order contiguity matrix is used, containing zeros on the main diagonal, rows that contain zeros in positions associated with non-contiguous regions

and ones in positions reflecting neighboring units that are (first-order) contiguous, defining contiguous here as sharing a common okres-boundary. The spatial autoregressive model (Equation 3) combines the standard regression model with a spatially lagged dependent variable, whereas y is the dependent variable vector, X represents the data matrix containing the explanatory variables and W is the spatial weight matrix. The estimated parameters ρ and β represent the coefficients of the spatially lagged dependent variable and the influence of the explanatory variables.

$$y = \rho W y + X\beta + \varepsilon$$
$$\varepsilon \sim N(0, \sigma^2 I_n)$$

(3)

A number of statistical tests is given in the literature, usable to detect the presence of spatial autocorrelation in the residuals from a least-squares model; the Lagrange Multiplier test and the Moran's *I*-statistic will exemplarily be used in this study. In case the last one shows that spatial correlation in the least-square residuals is given, the spatial error model (Equation 4) can be used in which the spatial dependencies are exhibited by the disturbances. The parameter λ represents the coefficient of spatially correlated errors.

$$y = X\beta + u$$
$$u = \lambda W u + \varepsilon$$
$$\varepsilon \sim N(0, \sigma^2 I_n)$$

(4)

In case there is evidence that a spatial dependence exists in the error structure from a spatial autoregressive model a general version of the spatial model, including spatial lagged term and spatially correlated error structures, is an appropriate approach to model this type of dependency (Equation 5). By this W_1 can equal W_2 but also different formulations can be found. In respect to LeSage and Kelley Pace [2009] we construct W_2 as $W_2 = W'W$.

$$y = \rho W_1 y + X\beta + u$$
$$u = \lambda W_2 u + \varepsilon$$
$$\varepsilon \sim N(0, \sigma^2 I_n)$$

(5)

Regarding panel data the spatial autoregressive (Equation 6) as well as the spatial error model (Equation 7) can also be applied [Elhorst 2003].

$$y_t = \rho W y_t + X_t \beta + \varepsilon$$
$$\varepsilon \sim N(0, \sigma^2 I_n)$$

(6)

$$y_t = X_t \beta + u$$
$$u = \lambda W u + \varepsilon$$
$$\varepsilon \sim N(0, \sigma^2 I_n)$$

(7)

Estimation results

Table 1. Estimation results from spatial models: average regional endowment 2002-2004

Variable or parameter	Spatial autoregressive model		Spatial error model		General spatial model	
	coefficient	z-prob	coefficient	z-prob	coefficient	z-prob
Constant	-2301.795***	0.000	-1853.566***	0.000	-1548.649***	0.000
Privatization	-24.227***	0.005	-28.593***	0.002	-18.809***	0.003
Empagr	-26.085	0.713	-9.442	0.879	-31.256	0.568
Adm	126.312*	0.080	135.314**	0.013	162.383***	0.004
Mage	39.238**	0.021	26.329**	0.014	23.850**	0.037
Spattime	98.146	0.282	44.655	0.598	114.397	0.145
Avinceur	2.796***	0.001	2.684***	0.001	2.014***	0.007
Netmig	11.195	0.257	9.541	0.312	21.036**	0.013
Agrarea	441.313**	0.023	434.938***	0.001	362.829**	0.012
TechEff	105.060*	0.062	161.275***	0.003	108.632**	0.024
ρ	-0.007	0.476	-	-	0.001	0.905
λ	-	-	-0.085***	0.000	-2.119***	0.000
R-squared	0.192		0.177		0.2440	
Rbar-squared	0.157		0.141		0.2110	
log-likelihood	-1239.907		141230.119		-1455.8521	

Abbreviations: Privatization: degree of privatization, Empagr: employment share of the agricultural sector, Adm: number of agencies per population, Mage: mean age, Spattime: spare-time facilities, Avinceur: average income, Netmig: net migration, Agrarea: share of area used for agriculture, TechEff: technical efficiency of local governments.

Source: own research.

First, we estimated the spatial models using the average regional endowment for the years 2002-2004 as explanatory variables (Table 1). The total received SAPARD payment per head of population is the dependent variable. All three models give similar results for the significances as well as for the directions of estimated coefficients. The idea of administrative units having a supporting character to receive SAPARD payments is approved as well as that a higher average income, agricultural area share and a technical efficiency of local authorities lead to a higher payment allocation. Regarding the positive influences of the mean age and net migration, whereas the last one is only significant in case of the general model, it is thinkable that a clearly positive correlation with the average income could be an explanation; but this is not the case. Rather, a higher age might represent a higher identification with the region and a better endowment with social relations; so the development plan formulation can easier be managed and a higher incentive occurs and forms a more clear and settled individual planning. Explanation for the negative impact of privatization might be on the one hand that public enterprises as well as cooperatives are more able to co-finance their project plans. On the other hand it is thinkable that private units are finally not familiar with or unaccustomed to the combination of private sector and public grant money and therefore they use this possibility less than public institutions do. The insignificant parameter of the spatial autocorrelation model implies that no spatial dependence is given. So, the SAPARD funding of the neighboring

regions in a year does not influence the amount of SAPARD funding a region receives in the same year.

When using a Lagrange Multiplier test for spatial correlation in the residuals of the spatial autoregressive model, any spatial dependence in the residuals of this model can be rejected. In contrast with that, the Moran's *I*-statistic indicates that there is a spatial correlation in the residuals of the spatial error model. The significant parameter λ gives evidence that a spatial dependence occurs as the residuals are spatially correlated. Although the test for spatial autocorrelation in the residuals of the spatial autoregressive model shows no evidence for residual spatial autocorrelation, and so the general model might not be appropriate, for the sake of completeness the results are also listed. The insignificance of the spatial lag and the significant value of the spatial error parameter are consistent with the explanations given before. As the majority of SAPARD payments took place during the years 2002 to 2004, it seems adequate to use a panel data approach in comparison to the average regional endowment discussed before. From applying the Hausman's specification test it can be deduced that a random-effects model is better suited than a fixed-effects model. A comparison of a pooled regression model with a random effects model shows hardly any differences. Therefore, the results of a simple random effects model without spatial effects are given (Table 2). In relation to the covariance matrix which shows unequal zero, spatial dependencies are included, too (Table 2).

Table 2: Estimation results from panel regression models (2002-2004)

Variable or parameter	Random Effects Regression Model		Pooled model with spatial error autocorrelation, no fixed effects		Pooled model with spatially lagged dependent variable, no fixed effects	
	coefficient	P>|z|	coefficient	P>|z|	coefficient	P>|z|
Priv	-23.951***	0.007	-20.100**	0.020	-22.179***	0.009
Empagr	-26.388	0.717	-22.355	0.756	-29.042	0.678
Adm	133.865*	0.066	102.210	0.174	116.822*	0.095
Mage	35.925**	0.027	38.669**	0.022	29.958*	0.061
Spattime	99.256	0.289	100.874	0.266	86.186	0.339
Avinceur	2.792***	0.001	2.131**	0.012	2.230***	0.007
Netmig	11.892	0.24	14.099	0.154	12.494	0.199
Agrarea	396.146**	0.038	370.207*	0.064	327.379*	0.078
TechEff	105.725*	0.066	77.401	0.165	86.505	0.117
spat.aut.	-	-	0.168*	0.066	-	-
W*dep.var	-	-	-	-	0.199**	0.026
Constant	-2194.631***	0	-2055.022***	0.001	-1807.839***	0.001
R-squared	0.1907		0.2049		0.2185	
Rbar-squared			0.1702		0.1804	
log-likelihood			-1584.043		-1582.4526	

Source: own research.

The directions as well as the significances of the estimated coefficients do not differ clearly in comparison to the first estimation results (Table 1); exceptions are on the one hand for the technical efficiency, which has still a positive but now an insignificant impact, and on the other hand for occurring spatial dependencies. Both spatial models show now significant influences; meaning that in case the panel data are used, a spatial dependency can be deduced from the spatial autoregressive model, too. Therefore, over time spatial influences occur as the funding of one region is positively influenced by the funding amount a neighbouring region receives. When comparing the log-likelihood values, the spatial error model seems to explain the spatial influence better than the spatial autoregressive one does; in relation to the R-squared values, both spatial models fit better than the simple regression model. So, the importance to recognize spatial dependencies in analysing structural spending is additionally reinforced.

Conclusions

This paper deals with determinants of the structural funds allocation using the special accession programme for agriculture and rural development SAPARD as an example. The decentralized program implementation as well as the focused partnership principle attracted our attention and caused investigation of this program. Because the allocation of regional policy funds varies dramatically across regions even when one controls for regional development indicators, we thought of local government performance as well as of spatial dependencies as explanations for a successful program participation. As possible determinants of SAPARD funding, the governmental and administrative structures were recognized as well as the socio-economic components, especially the sectoral structure. The estimations were conducted for 72 Slovakian okres during the years 2002-2004. Two different approaches were followed, recognizing in each case the possibility of spatial dependency. First, the average regional endowment was tested to explain the total amount of SAPARD payments a region received per inhabitant; second, a panel data approach was used, applying random effects models. The estimation results provide mixed results. The efficiency of local governments has a positive and in almost all models a significant impact on payment receipts. Also a higher share of land used by agriculture has a clearly positive influence, which was expectable in accordance to the program objectives and measures. In relation to the co-financing principle, the positive directions and significances of the average income seem also plausible. The insignificances of the employment share of the agricultural sector were unexpected but with respect to the program design explainable as that not the number of potential program submitters is decisive but their ability for plan formulation, partnership and financing management. Spatial dependencies occur in form of a spatial correlation in the residuals in both approaches. A spatial lag can only be found in the panel approach. The influence of neighbouring regions on the SAPARD payments a region receives is therefore a temporal aspect. This seems comprehensible as information or knowledge spillovers take better place regarding the whole program duration.

All in all, local government efficiency as well as spatial dependencies prove to be considerable determinants of structural funds allocation, whereas their impact has to be seen in context to regional socio-economic circumstances. As the structural programs are set out for a duration of six years, this study advocates using panel approaches to detect determinants of structural funding, especially with respect to occurring spatial dependencies

in form of spatial spillovers. Regarding the general objectives of structural policies to reduce intra- as well as international disparities, the impact of structural funding on the quality of life level should be focused in a more adequate way as done in this study which indicates therefore the contents of future research.

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