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CONTENTS

The importance and role of trust in agricultural marketing co-operatives[1]

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Abstract

Marketing co-operatives can strengthen countervailing power of producers and help to co-ordinate (agricultural) supply chains. According to many authors, one of the means of increasing the competitiveness of co-ops can be traced back to trust and informal connections existing between the members and the co-operative (management), as well as among the members. Using New Institutional Economics' theories and the "co-operative identity" concept as theoretical background, this review paper analyses the importance of trust, as well as the role of the co-operative principles as formal-legal securities of trust (development) in agricultural marketing co-operatives.

Keywords

co-operation, co-operative identity, principles, trust, vertical co-ordination

JEL classification

Q13, L14, L22

1. Introduction: background, motivation and methods

In theory and according to Western European (Dutch, Danish etc.) and US practical experiences (see Section 3 for details), one of the most important private institutions which can strengthen producers and help to co-ordinate (agricultural) supply chains is the marketing co-operative form. Apart from securing markets, agricultural marketing co-operatives can preserve a relatively high level of independence for their members compared to the integration by contracts offered by investment oriented (conventional) firms (such as public companies). Marketing co-operatives can also play significant roles in rural development, solving - at least partly - the very serious problem of unemployment in less developed rural areas. In addition to economic aims, there are *several non-economic benefits*, such as strengthening trust and social capital, which can also be important for the successful development of co-operatives and for society in general. The benefits offered by agricultural marketing co-operatives (see Section 3) are especially important in the case of agri-food economies in transition, especially under uncertainties dominating in the Hungarian fruit and vegetable sector (Fertő and Szabó, 2002a, 2002b; Szabó and Kiss, 2007; Szabó, 2008b, 2009).

Because of the new, more market-oriented environment (e.g. more liberal agricultural policies, opening European and world market, etc.) co-operatives execute new marketing strategies and use new management techniques. Emerging and transforming agricultural co-operatives in transitional economies, such as in Central and Eastern Europe also change their structures and forms of governance. In order to be able to grasp recent developments, a new, interdisciplinary research area (including contributions/intersections of the various fields of economics, law, marketing, financing, organisational studies and management sciences ("hard" sciences), and also some elements of philosophy, psychology, sociology etc. ("soft" disciplines) is proposed.

[1] An earlier version of the paper was presented at Conference on "Transition in Agriculture - Agricultural Economics in Transition VI" Institute of Economics, Hungarian Academy of Sciences, Budapest, 6-7 November, 2009 and a different one had been submitted to EMNet 2009: 4th International Conference on Economics and Management of Networks University of Sarajevo School of Economics and Business, September 3 to September 5 (see Szabó et al., 2009).

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Trust in co-operatives is usually considered as one of the main advantages which can help co-operative members to realise their economic and non-economic aims. According to many authors (e.g. Røkholt, 1999; Røkholt, 1999; Wilson, 2000; Borgen, 2001; Hansen et al., 2002 etc.), one of the sources of increasing the competitiveness of co-ops (for example by decreasing transaction costs) can be traced back to trust which exists between the members and the co-operative (management), as well as among the members.

In this review paper, the importance, foundations and roles of trust in agricultural marketing co-operatives are analysed. New Institutional Economics (e.g. agency and transaction cost economics) and the concept of the "co-operative identity" supply the theoretical framework. Brief empirical (case) studies supplement the theoretical considerations.

The structure of the paper is organised as follows: after introduction, the second section briefly reviews the relevant current literature regarding trust. In section three economic advantages and limitations of marketing co-operatives in coordination of agricultural producers are shown. Section four presents human factor foundations and role of trust in agricultural co-operatives including reviewing some empirical studies. The co-operative principles as formal-legal securities of trust in co-operatives are in the focus of the fifth section. Finally, we draw conclusions with implications for further research.

2. Different approaches to trust[3] with special emphasis on the agri-food economy

Trust as a subject of study of (agricultural) economics is a relatively new phenomenon in spite of the fact that it was used more in sociology, anthropology and other "soft" disciplines. However, in the last 25 years the number of publications on trust in the economics literature has grown vastly. Some of them contain one or more definitions of trust or some classifications of categories related to the term. It would need an entire publication to list them, so here only some very important references will be made.

One of the most general but most useful definitions of trust can be found in Oxford Advanced Learners' Dictionary (2005): "Trust (as noun, Sz. G.G.): trust (in sb/sth) the belief that sb/sth is good, sincere, honest, etc. and will not try to harm or trick you". (Oxford, 2005:1645)

Trust as a verb has an interesting, slightly different meaning in the same dictionary:

"1. to have confidence in sb; to believe that sb is good, sincere, honest, etc.: 2. to believe that sth is true or correct or that you can rely on it." (Oxford, 2005:1646)

The definitions above are suitable for understanding trust in everyday life, but they also give us some correct information on how farmer-members think/feel about their business partners and co-operative leaders/management if they are reliable. Farmers only decide whether they can rely on them and whether they can trust them (as they are honest people), they do not separate and categorise their feelings/beliefs regarding trust as researchers do.

Nevertheless, to be able to understand the development of trust in co-operatives and possible ways to influence it, different authors (e.g. McAllister, 1995; Wilson, 2000; Borgen, 2001; Hansen et al., 2002 etc.) classify many types of trust (e.g. cognitive and affective types etc.) as well as different levels of trust in co-operative organisations (e.g. between two members, among multiple members in general, as well as between the members and management).

[3] Trust can be viewed as part of social capital (Szabó et al., 2005; Tömpe, 2008 etc.) which is even larger context and it can be used for a more complex approach to rural and family enterprise development.

One of the most cited paper is by McAllister (1995). The author identifies two main types of trust: affective and cognitive. The former is more subjective and emotional bonded, while the latter is mainly based on rational calculations and empirical evidence.

Wilson (2000) classifies different trust hierarchies (Wilson, 2000:5), as well as giving an overview and critique of social capital and trust, including references to agribusiness economics. He also examines the changing types of trust in business relationships (trust mix) over time and states that weak trust can be changed into semi-strong trust or later even into strong trust. He also argues that trust which alters the terms of trade can reduce transaction costs and create additional (time) resource and flexibility for the management.

Regarding agricultural economics, some authors deal with the role and different levels of trust in agricultural (marketing) co-operatives (see Section 4). Only the ones dealing with definition and/or classification of trust will be mentioned in this section. Hansen et al. (2002) develop these categories further and also use a process based approach. They also distinguish two types trust: among members and also between members and the management.

Based on a large volume of literature on the topic, Sodano states "…that trust is essential to guarantee the success of cooperative relationship." (Sodano, 2002:104) Referring to the existing literature, she also emphasises "…the role of trust in facilitating vertical contractual relationship as well as horizontal coordination in the agricultural sector through grower associations and cooperatives" (Sodano, 2002:105). In searching for a "workable" definition of trust, Sodano presents two main types of trust:

1. Trust as a form of social organisation (impersonal trust), and

2. Trust as an exchange coordinating means or governance structure (interpersonal trust). Contrary to Williamson (1993), she thinks that the connection between trust and transaction cost economics is more complementary rather than alternative in approaching to organisational problems. She also examines the role of trust and vertical coordination in the food system. By reviewing the literature she states:

"1. Networks, and primarily strategic alliances seem to be the best organizational firm's response to new challenges...

2. Trust is a basic asset required to build stable and effective networks.

3. The kind of trust with the highest effectiveness ("productivity") in promoting networks is the less rational one ...

4. Supply chain management through inter-organizational network is generally expected to enhance total system efficiency and welfare" (Sodano, 2002:109).

Bakucs et al. (2008) give a theoretical background of trust in agricultural co-operatives, including references for more detailed reviews. Fairbairn (2008) in searching for the co-operative advantage and questioning whether co-operatives should have social goals as well, apart from economic ones, states: "To realize the importance of trust and social capital to co-operatives – the importance of culture – is to some extent to return to the roots of co-operation (Fairbairn, 2008:207). Török and Hanf (2009) also argues that "trust plays an important role for farmers to join a marketing cooperative in transition countries" (Török and Hanf, 2009:1). They also "…distinguished trust from other similar constructs like cooperativeness, confidence and expectation" (Török and Hanf , 2009:9).

Jones and Kalmi (2009) approach trust on a macro level with comparison of the 300 largest co-operatives that can be found in the International Cooperative Alliance (ICA) database. They conclude that "Consistent with theory we find strong support for the proposition that trust plays a causal role in accounting for differences in co-operative incidence" (Jones and Kalmi, 2009:165). Their focus is on all forms of co-operatives, although they consider agricultural co-operatives (mainly the ones in food production) as one of the most important forms of co-operative. Their "key results on the significance of trust highlight the role of interpersonal trust as a prerequisite, rather than a consequence, of co-operative incidence". (Jones and Kalmi, 2009:190). Based on their empirical results, regarding the possibilities of solving market failures by co-operatives, they state: "Since lack of trust and market failures often may occur in the same countries, it may be that co-operatives do not grow where the potential benefits from them would be highest, such as in developing and transition countries" (Jones and Kalmi, 2009:190). They also state the limitation of their survey, namely that they included data from only the largest developing countries and disregarded numerous small co-operatives.

After briefly reviewing different theoretical approaches to trust, let us see what advantages agricultural co-operatives usually offer to their members and what their main limitations are.

3. Economic advantages and limitations of marketing co-operatives in the coordination of agricultural producers

There is a great range of different (marketing) organisations of agricultural producers in the agri-food economy of the European Union, such marketing co-operatives (van Bekkum and van Dijk, 1997; Ollila and Nilsson, 1997) and Producers' Organisations (POs). POs are active in the fruit and vegetable sector and have to fulfil certain requirements. A significant advantage of these organisations is that the fruit and vegetable producers could afford the support of the EU solely through their POs. They exist in other legal forms as well, like joint stock companies, LTDs etc., however their main organisational form is the co-operative, mainly the marketing co-operative. The latter fact might be connected to the so called co-operative principles and their roles in guaranteeing that their own organisation will not exploit members.

Marketing co-operatives in Western Europe and the United States are specialised to process and sell the products of their members and used to be considered as the classical form of co-operation of different and independent farmers in order to protect themselves against the large commercial and/or industrial companies which are often in a monopolistic or oligopolistic position. The development of countervailing power (Galbraith, 1963) – even only regionally – through the disposal of the products collected by co-operatives and other producer-owned organisations can bring results such as strengthening market competition (e.g. 'radiation effect' on prices). This impact could have a positive efficiency effect on the whole chain or sector and might raise the members' income in a socially well accepted way. Therefore establishing countervailing power by cooperatives might generate a positive welfare effect as well without any or significant state support financed by taxpayers.

In Western Europe, for example in the Netherlands and Denmark (agricultural) co-operatives are bottom-up organisations and have emerged through a volunteer base (Meulenberg, 2000). They have a so-called "double character": toward the market: they are market oriented, but the surplus made by the co-operative goes to the farmer-members, in proportion to their product delivered/bought to/from the co-operative, after deducting the costs of the co-operative's operation and funds for reserves.

In this study we use the basic USDA co-operative concept which reflects three basic criteria: "A cooperative is a user-owned and user-controlled business that distributes benefits on the basis of use" (Barton, 1989a:1). According to this definition three main relationships exist between the member and the marketing co-operative: the product, the capital and the democratic managing-control line. The definition can also provide the main points of the Dutch and Danish approach. The 'economic' co-operative principles (see later) are based on the three main connections mentioned above, as they were formulated in coherence with the elements of the co-operative's business activity with its members. The statute or bylaw contains formal legal guarantees (e.g. principles, see later) that the co-operative will never act against the members and that members will enjoy their advantages and fulfil their duties. The bylaws (as multilateral contracts among members) also defend third parties against the co-operative, making it possible to sign contracts and obtain loans and credits in the name of the co-operative.

One can distinguish the following potential incentives for the establishment of co-operatives as a form of horizontal and/or vertical integration. Firstly, co-operatives traditionally can provide access and secure markets for the long term, therefore giving protection for independent farmers against the large commercial and/or industrial companies. They can also offer services otherwise not available or only at very high costs. Secondly, co-operatives build up countervailing power and above a certain economics of scale they act as a competitive yardstick for non-co-operative, conventional firms and the whole sector with a better influence on the market and prices. Thirdly, co-operatives in some cases can increase technological and market efficiency and carry out activities with a higher added value. Fourthly, co-operatives can decrease and internalise transaction (information) costs, with a better flow of information on consumer demand – closer proximity of consumer to farmer and with a unified decision role between two or more levels of the marketing channel. The co-operative can also lower both economic and technological uncertainties and therefore decrease transaction costs. Finally, co-operatives can increase the income of their members by lowering transaction and production costs, by reimbursement of the surplus for the members made at another level of the marketing channel (Szabó, 2002).

In order to be able to exploit economic and non-economic (see Section 4) advantages, apart from the co-operative principles, the marketing co-operatives use long, medium and short term contracts to secure the raw material for themselves and to be able to govern the whole marketing chain (Sykuta and Cook, 2001; Hendrikse and Veerman, 2001a; Szabó and Bárdos, 2006 etc.). Furthermore, the co-operative is a partial vertical integration, which means that farmers can retain a relatively high degree of independence of economic action: "Thus, it is possible to reduce transaction costs and uncertainty through the cooperative and maintain the entrepreneurial incentives through the market at the same time" (Ollila, 1994:88).

Despite the benefits mentioned above, as a very closely related issue to transaction cost economics and the (democratic) decision-making process, there are a number of potential problems (financing higher value added activities, taking risk bearing capital, incentives to invest into the co-op, heterogeneity of members) of the traditional (countervailing power) co-operative model (van Bekkum and van Dijk, 1997; Nilsson, 1998b) according to the agency theory (Cook, 1995; Nilsson, 1998a; Vitaliano, 1983). The basic source of the agency problems of complex organisations is the separation of ownership and control. In the case of co-ops, the separation of the management (agent) and the owner-members (principals) can arise different incentives, therefore managers sometimes carry out business according to their objectives at the expense of the owners (Royer, 1999).

We may conclude this section by stating that agricultural marketing co-operatives have advantages in those cases where there is a significant market failure, especially in the cases of some perishable products like fruit, vegetables and milk, and when the market is not saturated. Relational connections in the co-op (see Section 4) are crucial factors for solving the first hold-up problem., e.g. preventing post harvest hold-ups (Hendrikse and Veerman 2001b), at least at the relatively low level of product differentiation.

When the market-mechanism is working well and the different types (contracting, monitoring, enforcement) of transaction costs are not high in comparison to the internal organisation costs, then a co-operative organizational form is not as a desired governance structure and/or marketing strategy as in the previous case (Harte, 1997). Hendrikse and Veerman (2001a) also argue that in differentiated product markets with a high level of asset specificity, the marketing co-operative is probably not the best solution as a governance structure. It is not without a reason that a conversion process into investment oriented forms (e.g. public limited companies, LTDs etc.) is taking place nowadays in Europe and US which is a major challenge for co-operatives. However, informal network and trust among members can be competitive advantages for agricultural co-operatives.

4. Non-economic advantages and the role of trust in marketing co-operatives

4.1. Non-economic reasons for co-operation

In addition to economic aims, there are several non-economic reasons and considerations (Hakelius, 1996), such as strengthening trust and social capital, which can also be important for the successful development of co-operatives and for society in general.

Trust in co-operatives is usually considered as one of the main benefits which can help co-operative members to realise their economic and non-economic aims. The main reasons connected to trust and other human (soft) factors which can offer "co-operative" advantage for agricultural marketing co-operatives are as follows.

Firstly, co-operatives used to be considered as organised trust, which can determinate the success or failure of a certain co-operative: "Trust is a major co-operative advantage" (Spear, 1999).

Secondly, the social and informal network of members or potential members is also relevant as a determining factor in reducing transaction costs and in the process of establishing and the running of the activity of a co-operative. More knowledge and confidence (Røkholt, 1999) among members is vital to how co-operatives can be highly efficient in terms of the management of human relations, despite the lack the necessary capital to invest. At least in smaller communities (e.g. villages) a highly important issue is which persons are to be responsible for the management of the co-operative. Another benefit of the co-operatives is based on the closer and more informal connection among the members and between members and co-operative. Human asset specificity might become more important in the process and success of flow of information.

4.2. Role of trust in agricultural marketing co-operatives: selected empirical studies

One of the most inspiring papers on trust-generating mechanisms in co-operatives is by Borgen (2001). The author explores the topic using a dynamic approach and finds empirical supports"…that stronger the members' identification to the collective organization, the more they trust the benevolence of the cooperative management". He especially points out "…the significance of

identification-based trust in case of modern, large-scale cooperatives. (Borgen, 2001:222). He also argues that an important "…reason why trust is so important in cooperative organizations is its potential capability to mitigate agency problems (Borgen, 2001:211). We can argue here that co-operative principles can play a key role in establishing and developing the coherence in the organisation through loyalty and commitment. Shared norms and values help "…to build the required social capital and degree of trust" (Borgen, 2001:214).

Hansen et al. (2002) analyse the role of trust on co-operative retention, performance and members' satisfaction by examining trust along two dimensions: cognitive and affective. They also "argue that cognitive and affective trusts refer to the process by which one determines that an individual, group or organization is trustworthy" (Hansen et al., 2002:43). Their empirical findings based on the evaluation and test of two marketing co-operatives suggest that "…trust among members and trust between members and co-op management are important predictors of group cohesion, which is a measure of the strength of the members' desires to remain in a group (co-op) and their commitment to it" (Hansen et al., 2002:1).

James and Sykuta (2005) find that "Producer owned firms[4] (POFs) have a potential advantage over investor owned firms (IOFs) in that a higher degree of trust between POFs and producers may create contracting or operating efficiencies unavailable to IOFs." However, their empirical "… results also suggest that organizational trust and members' investment incentives can be competing interests; property rights that have been shown to promote investment incentives are counter to those associated with organizational trust" (James and Sykuta, 2005:574). They also find that higher the homogeneity of member interest as they are more "equal", higher the organizational trust in producer-owned firms (James and Sykuta (2005). Ranging organisational form related to transaction costs Valentinov and Curtiss (2005) find that in cases of both agricultural producer and service co-operatives, "Trust is essential for creation and normal functioning of these organizations" (Valentinov and Curtiss, 2005:33).

Regarding transition economies, theoretically marketing co-operatives may solve many problems of transaction related problems via horizontal and/or vertical coordination. However, the number of co-operatives is still limited in transition countries like Hungary, although "…trust plays an important role for farmers to join a marketing cooperative in a transition country" (Bakucs et al., 2007, 2008). One possible explanation for this phenomenon is the lack of trust and willingness to co-operate among producers, as well as between farmers and their business partners (Bakucs et al., 2008). Analysing the most important causes to join a co-operative, Bakucs et al. find "…that the quantity, the existence of contract, flexibility and trust are the most important factors for farmers to selling their product via cooperative" (Bakucs et al., 2007:15).

Bakucs et al. (2008) investigated the impacts of trust among the members, as well as between the members and the management in the case of Hungarian Mórakert co-operative. According to the author's knowledge, this paper was the first to systematically investigate different types of trust among members of a marketing co-operative and between members and management of a co-operative in a transition country. They focused on the effect of trust on co-operative membership performance, satisfaction and their commitment to remain a part (member) of the co-operative according to the hypotheses and findings of Hansen et al. (2002), which analyse the role of trust in cooperative performance.

[4] Like agricultural marketing co-operatives as premier examples.

Mórakert Purchasing and Service Co-operative (established in 1995) was the first officially recognised PO in Hungary and was certified in 2002. The co-operative extended its membership and circle of suppliers during the period 1995-2007 and tried to involve more segments of the fruit and vegetable chain. The increase in both membership and the turnover of the co-operative demonstrate that the co-op was operating efficiently during that period. The total net revenue of Mórakert co-op reached HUF 8 billion in 2007, a very significant result for the sector. However, 2008 and 2009 were not as successful as the previous ones, for example the turnover of the co-op in the first half of 2009 was about 40% of the similar period in 2008. They expected a turnover of about HUF 4 billion in 2009, which is only half of the result in 2007. The major problems are connected to liquidity: members do not trade their products to the co-operative, instead they try to sell them on spot (generally on the grey and black markets), getting cash immediately. While that way of short-term thinking and thus bypassing the co-operative route destroys the marketing channels of the co-op; on the other hand the behaviour of members can be understood: they have to finance their family life and also their own farming. The Co-op had 776 owner-members in July 2009.

The results by Bakucs et al. (2008) suggest that trust among co-operative members and trust between member and management have positive effects on group cohesion. They also find, as did Hansen et al. (2002), that affective trust has a greater impact on group cohesion than cognitive trust on both levels. In addition, trust among members has a greater impact on group cohesion and members' satisfaction than trust between members and the management (Bakucs et al., 2007).

The success story (in terms of increasing turnover and membership from 1995-2007) of the above mentioned Mórakert Co-operative (Szabó, 2009) was due to the friendly and supportive approach of the local authority, the various sources of capital derived from funds for development, and above all, the trust and loyalty within the co-operative. However, as the co-operative got bigger and because of the liquidity problems arising from the economic and financial crisis from 2008, loyalty and trust have become a very sensitive issue, since there were huge delays in payments to members for the their products (HUF 2 billion) due to a number of micro- and macro-level problems. The president and the new managing director had to personally talk with all of the members one by one in order to ensure that they voted for the necessary changes before the assembly of delegates in March 2009 (Szabó, 2009). As the president of the Mórakert Co-op said: "The retrieval of trust (of the members, author) is a matter of money" (Hódi, 2009). The main important weapons in the hands of the co-operative manager and president to gain back the trust of the members are secure markets and prompt payments for the products of the farmers.

Financial solutions of the above liquidity problem in July 2009 came from four sources: a loan from the local authority (municipality), members' contributions in different ways, state intervention through DATÉSZ Zrt. (closed joint stock company) and remodelling (restructuring) the co-operative into a "for-profit" organisation (to get reserves and savings for financing their development) including a cost saving plan and changes in the management. However, in a following stage of co-operative development the co-operative will probably be faced with a number of liquidity problems, decreasing turnover and issues usually emerging in the case of traditional (countervailing power) co-operative model which probably will influence and change marketing, financial and possibly the organisational strategies of the co-operative.

Dudás (2009), analysing the co-operative's role in coordinating fruit and vegetable producers, deals with trust issues as well. His survey was based on a questionnaire used by Bakucs et al. (2007, 2008). Dudás summarises his empirical results regarding the impact of trust on co-operative members' group cohesion, performance and satisfaction (emphasis in original) as follows: "Produc-

ers' low willingness to cooperate is possibly due to lack of trust. In a questionnaire survey I justified that at ZÖLD-TERMÉK Cooperative trust has a decisive impact in the development of group cohesion. More precisely, affective trust has a greater impact on group cohesion than cognitive trust. I found that group cohesion has a positive impact on members' performance and satisfaction**.** Furthermore, it is again affective trust that has a greater impact on members' performance and satisfaction, not cognitive trust. The greater effect of affective trust implies that the emotional foundations of an association and cooperation are stronger than tangible economic results. A PO management may improve the cohesion within the cooperative by increasing its own trustworthiness and strengthening personal contacts (both among members and between members and management). This way its members would be satisfied and stay cooperative members" Dudás (2009:21). It would be very interesting to see further studies along the same guidelines (e.g. questionnaire) to be able to make comparisons among (at least) the Hungarian POs.

The crucial issue for the future of agricultural co-operatives is the loyalty of farmers to their co-op and the leaders of the co-operative, especially under uncertainties dominating in transition agriculture like the Hungarian fruit and vegetable sector (Szabó, 2008b). There are a number of reasons why members still have loyalty to their co-op and trust on different levels is one of the most important. The "organized trust" connected to relational connections in the co-op are crucial factors to solve the first hold-up problem, e.g. prevent post harvest hold-ups (Hendrikse and Veerman 2001b), at least at the relatively low level of product differentiation.

Forgács (2006) examined two Hungarian agricultural co-operatives as case studies based on interviews. "Field work was carried out in a traditional cooperative, BÉKE, and in a newly-established Purchasing and Marketing Cooperative, HAJDÚ GAZDÁK (PMCHG)" (Forgács, 2006:23). The most important findings of the study regarding trust and opportunism are the following: "Members in both co-ops regarded trust and reciprocity as important elements of social capital. However, their approach to the issue reflects different standpoints. Trust towards formal institutions differed in the two co-ops. Members of PMCHG had low levels of trust in current government officials and EU institutions. In contrast, BÉKE members had more trust in national government and their trust in EU institutions was also above average. However, where trust levels in state institutions were low, to reduce transaction costs people looked for informal institutions to solve their problems" (Forgács, 2006:32).

It is also very interesting that the study applies a macro-level approach in connection to a micro-level one. It is remarkable how farmers trust in their own organisation in order to solve their (marketing) problems (such as lowering transaction costs) instead of relying on governmental and/or EU institutions. Forgács (2006) also states: "In the two cooperatives the role of leadership differed somewhat. In the BÉKE" Co-op, the management's goal was to avoid breaking up the cooperative community, while at PMCHG the key players' central responsibility was to persuade individual farmers to begin and solidify cooperation in order to build up a new cooperative community. In both co-ops the trust placed in management indicated that leadership plays an important role in cooperatives" (Forgács, 2006:35).

Using literature survey, Török and Hanf (2009) also examine briefly some Hungarian co-operatives examples and they conclude: "…the main expectations are to secure the market and decrease transaction costs. In addition, these cooperatives could be established, because of the significant confidence level of members. Their confidence based on their experience with other members and/or the leader, on the clear rules, and on knowledge about members' mutual interest. We can also observe that trust in the leader of the cooperatives can be integrated into the confidence and

cooperativeness of the members. So we can see that due to verticalisation as well as due to the huge number of small producers, the idea of forming horizontal co operations (i.e. cooperatives) can and must be taken into the context of transition countries" (Török and Hanf, 2009:9).

The above mentioned empirical results cannot be generalised since they are only case studies and also since the survey has the number of observations of 136 in case of Mórakert Co-op (n = 136) and 57 (n = 57) in case of ZÖLD-TERMÉK Cooperative. All cases have geographical and commodity limitations as well. Thus, further research is needed to clarify the role of trust in the success or failure of marketing co-operatives in Hungary and other transition countries.

5. The so called co-operative principles and their connections with trust

The concept of the "co-operative identity"[5] (Szabó, 1997, 2006a, 2006b, 2008a) is proposed to serve as a general theoretical background for the economic evaluation of the role of trust and its relations to co-operative principles in (agricultural) co-operation. Although co-operative identity has involved some other aspects beside the principles, namely values (Böök, 2002) definition(s), aims (purposes), functions, etc. of the co-operative and co-operation, for most co-operators the so-called co-operative principles are the cornerstones of the evaluation of the validity of a co-operative. For many people co-operative principles can prove that a co-operative is genuine one or not and they can help to develop a unique organisational character of the organisation (Craig and Saxena, 1984; Davis, 1995).

It is necessary to distinguish the principles from the policies and practices of co-operatives. According to Barton (1989b: p.23) the following terms can be distinguished:

" A principle is a governing law of conduct, a general or fundamental truth, a comprehensive or fundamental law".

" A policy is a wise or expedient rule of conduct or management. It is not a universal, unchanging truth but a highly recommended course of action, given the situation."

" A practice is a usual method, customary habit, action, or convention; a frequent or usual action. Substantial flexibility exists ... respecting the cooperative definition, principles and policies."

Barton gives a wider explanation of the terms outlined above, but these shorter definitions are appropriate for our purpose. Amongst other points, Barton also states in his (quoted) paper that the co-operative principles with the definition of a co-operative "...preserve the essential objectives and uniqueness of the cooperative form of business" (Barton, 1989b: p.23). From this observation it is clear that the co-operative principles are essential to grasp the co-operative identity**,** which opinion is shared by other authors (Davis, 1995; MacPherson, 1994; Røkholt,1999 etc.) as well. According to Craig and Saxena (1984): "The strength of the principles has been that they are stated in a simple, straightforward and easily understood way. This is an important characteristic. Other characteristics include internal consistency and logic applicability to organizations irrespective of the external environment in which function; and long term relevance" (Craig and Saxena, 1984: vi).

[5] The idea of examining co-operative aims, principles and the needs of co-operatives according to each sector in agriculture was mentioned to the author by Zwanenberg (1995). This was in contrast to those who had sought to identify a general set of co-operative principles (ICA, 1995). This was a starting point for the author to develop a new concept of "co-operative identity". More detailed analyses of the concept and the main relations between various elements of the "co-operative identity" can be found in Szabó (1997, 2006a, 2006b, 2008a).

According to Barton (1989b) there are four distinctive classes of principles which more or less overlap with the ICA principles (see later) and also with each other. These main groups are the Rochdale, the Traditional**,** the Proportional and the Contemporary class of co-operative principles. However, our main aim is not to examine the whole scale of the optional sets of co-operative principles; therefore, details of these four classes can be found in the book cited above (Barton, 1989b:26-30).

The elements of the Proportionality class of principles of co-operatives are in accordance with Barton (1989b: p.27):

"1. Voting is by members in proportion to patronage

2. Equity is provided by patrons in proportion to patronage

3. Net income is distributed to patrons as patronage refunds on a cost basis".

The Contemporary set is almost the same, but differs from the previous one in the fact that the proportionality basis is not stressed in the first and is absent from the second point.

Reflecting the recent changes in economic and social life all over the world, the ICA had established a working group (Böök, 1989, 1992) to review the current basic values and principles of co-operation. The new statement containing the final list of the new principles was made in Manchester in September 1995 (ICA, 1995). The seven principles, which have been more or less accepted and implemented in most countries, are the following:

1. Voluntary and Open Membership
2. Democratic Member Control
3. Member Economic Participation
4. Autonomy and Independence
5. Education, Training and Information
6. Co-operation among Co-operatives
7. Concern for Community

The organisational form and decision-making (control) mechanism of the co-operative and the so-called co-operative principles (Barton, 1989b; MacPherson, 1994; ICA, 1995; Hakelius, 1996; Røkholt, 1999) can be taken into consideration as formal-legal securities (guarantees) of trust between the member and co-operative. Hence the so-called hold-up problem (Royer, 1999; Hendrikse and Veerman, 2001b; Karantininis and Nielsen, 2004) is usually not as significant as in any other contractual relationship between a farmer and Investment Oriented Firms (IOF).

The hold-up problem, probably the most known example for ex post problem/cost, relevant in agriculture, "… arises when one party in a contractual relationship seeks to exploit the other party's vulnerability due to relationship-specific assets" (Royer 1999:49). The hold-up problem is significant in the dairy and fruit-vegetable sectors, explaining the existence of the high share of co-operatives in these industries (Staatz, 1984; van Bekkum and van Dijk, 1997; Kyriakopoulos, 2000). The members of a marketing co-operative are not likely to fear that after investing into relationship-specific assets, the other party (e.g. the processor or wholesaler) will change his/her mind and force them to accept lower prices for their products or otherwise terminate their contractual relationship.

It is further argued in the present paper that information and some parts of the enforcement costs are lower in co-operatives due to the special relationships and bonds among members.

As mentioned earlier, beyond the economic advantages of co-operatives there exist some non-economic ones connected to member relations and co-operative principles. Very important advantages of the co-operatives are based on the closer and more informal connection among the members and between members and the co-operative. Røkholt (1999, 2000) distinguishes four types of member loyalty: power based, habit based, tradition based and solidarity based. These can be the basis for the co-operative to be able to use the co-operative rationale as comparative advantage and able to develop strategies utilising strengths instead of eliminating weaknesses of the co-operative form as suggested by economic theories, like transaction cost based considerations. All in all, the network of personal relations among the members represented and secured by co-operative principles are very important connections from the point of the co-operative rationale (Røkholt, 1999).

However, one has to keep in mind that co-operative principles along with the democratic decision making process in co-operatives were/are sometimes obstacles to flexible business activity, especially in gaining more risk-bearing capital for more activities with higher added value. Moreover, the one member – one vote principle which was/is considered as the cornerstone of proving whether a co-op is genuine or not is not right from an economic point of view in cases of some new generation types marketing type of co-operatives. For example in the case of a dairy co-op the member supplying much more milk to the co-operative processor takes a much higher risk than another one delivering less milk. The activity of the co-op affects more deeply the farming and income of the "bigger one". Additionally, the limited if any interest paid on the capital invested into the co-operative (e.g. co-operative shares) weakened and limited the financial positions and possibilities of carrying out new (marketing) strategies of the co-ops and their members.

A multiple voting system might be related for example to the proportionality principle. Clear and rational limitation of votes per member can help co-operatives to able to keep members with higher patronage and also to be able to gain more capital from members. It is understandable: if somebody delivers ten or more times as much raw material (e.g. milk) to the co-operative than others then she or he would like to have more influence on the governance of the co-operative.

Generally speaking, if co-operative principles as safeguards have less power in practice (e.g. members even do not know them) then probably less trust will be generated in the co-operative and it will lead to economic inefficiency (occasionally to bankruptcy) or conversion to other, more secure and solid organisational forms, like LTDs and public companies. In transition countries the situation is even more complicated: co-operative principles (although in most of the cases stated in co-operative legislation) are still "top secrets" even for the members themselves.

6. Conclusions

A higher degree of co-operation among producers is important from the point of better coordination of the whole chain and it can enhance (consumer) welfare as well. Despite of the many theoretical economic and non-economic advantages offered by co-operatives, recent empirical evidence is sparse in this regard, and various studies reported controversial experiments on the viability of the co-operatives in modern agriculture. The bottom line is that until the product/service line is more important to the capital line in a co-operative and principles can secure this relationship, then an organisation acts as a co-operative despite the fact of its actual legal form.

Trust in co-operatives is usually considered as one of the main benefits which can help co-operative members to realise their economic (e.g. decreasing transaction costs) and non-economic aims. The crucial issue for the future and main advantage of agricultural co-operatives can be the

loyalty of farmers to their co-op and to the leaders of the co-operative, especially under uncertainties dominating in the transition agriculture. The "organised trust" connected to relational connections in the co-op are crucial factors to solve the (first) hold-up problem.

Co-operative principles can be seen as obstacles to the efficient operation of an organisation (because of more complicated and slower decision making process in the organisation) or can be taken into consideration as formal-legal securities (guarantees) of trust between the members and co-operative (management), as well as among the members. Co-operatives with a strong and flexible identity can use principles and trust (generated and preserved by those principles) for their advantages thus increase their economic viability.

Generally speaking, if co-operative principles as safeguards have less power in practice (e.g. members even do not know them) then probably less trust will be generated in the co-operative and it will lead to economic inefficiency (occasionally to bankruptcy) or conversion to other, more secure and solid organisational forms like LTDs and public companies. In transition countries the situation is even more complicated: co-operative principles (although in most of the cases stated in co-operative legislation) are still "top secrets" even for the members themselves.

In the sense of the considerations proposed, this paper can be regarded as a preliminary study for further research. More empirical analyses are needed on the subject of trust-generating processes as well as on the development of trust in cases of (agricultural) co-operatives. The author would be grateful for any comments and/or suggestions, including ones for future collaboration in any issues addressed in this study!

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References

1. **Bakucs**, L. Z., **Fertő**, I. and **Szabó**, G. G. (2007): The Choice of Marketing Cooperative in a Transition Agriculture. I. Mediterranean Conference of Agro-Food Social Scientists, 103th EAAE Seminar in Barcelona, April 23-25, 2007.

2. **Bakucs**, L. Z., **Fertő**, I. and **Szabó**, G. G. (2008): The Impact of Trust on Co-operative Membership Performance and Satisfaction in the Hungarian Horticulture. In: Cs. Csáki and Cs. Forgács (eds.), **Agricultural Economics and Transition: "What was expected, what we observed, the lessons learned. Studies on the Agricultural and Food Sector in Central and Eastern Europe** Vol. 44. Halle: Leibniz Insitute für Agrarentwicklung in Mittel and Osteurope, 382-392.

3. **Barton**, D. G. (1989a): What is a Cooperative? In: Cobia, D. W. (ed.), **Cooperatives in Agriculture**. New Jersey: Prentice-Hall, Inc., 1-20.

4. **Barton**, D. G. (1989b): Principles. In Cobia, D.W. (ed.). **Cooperatives in Agriculture**. New Jersey: Prentice-Hall, Inc., 21-34.

5. **Borgen**, S. O. (2001): Identification as a trust-generating mechanism in cooperatives. **Annals of Public and Cooperative Economics** 72 (2): 209-228.

6. **Böök**, S. A. (1992): Co-operative Values in a Changing World (Summary of the Report to the 1992 ICA Congress): In: XXXth Congress, Tokyo, October, 1992, International Co-operative Alliance Agenda&Reports. **Review of International Co-operation** 85 (2/3): 157-169.

7. **Cook**, M. L. (1995): The Future of U.S. Agricultural Cooperatives: A Neo-Institutional Approach. **American Journal of Agricultural Economics** 77: 1153-1159.

8. **Craig**, J. K. and **Saxena**, S. K. (1984): A Critical Assessment of the Co-operative Principles. **Co-operative College of Canada Working Papers** 3 (2): 1- 41.

9. **Davis**, P. (1995): Co-operative Management and Co-operative Purpose: Values, Principles and Objectives for Co-operatives into the 21st Century. Management Centre, University of Leicester, Discussion Papers in Management Studies No. 95/1, January 1995.

10. **Dudás**, Gy. (2009): Producer organisations' (POs') prospects of coordinating fruit and vegetable producers, illustrated through the example of 'ZÖLD-TERMÉK'Cooperative. Unpublished Summary of the Ph.D. Thesis. Szent István University, Management and Business Administration Doctoral School, Gödöllő, Hungary.

11. **Fairbairn**, B. (2008): Communications, Culture, and Co-operatives: Liminal Organizations in a Lininal Age. In: I. MacPherson and E. McLaughlin-Jenkins (eds.), **Integrating Diversities within a Complex Heritage. Essays in the Field of Co-operative Studies.** Series of Cooperative Studies, Vol 2. New Rochdale Press: BC Institute for Co-operative Studies, University of Victoria, Victoria BC., 179-222.

12. **Fertő**, I. and **Szabó**, G. G. (2002a): The Choice of the Supply Channels in Hungarian Fruit and Vegetable Sector. Paper presented at the Annual Meeting of the American Agricultural Economics Association in Long Beach, July 5-8, 2002.

13. **Fertő**, I. and **Szabó**, G. G. (2002b): Vertical Co-Ordination in Transition Agriculture: a Hungarian Co-Operative Case Study. Budapest: MTA KTK, Discussion Papers (New Series), MT-DP 10., 2002.

14. **Forgács**, Cs. (2006): Leadership and the importance of social capital in the transition of cooperatives. A case study of two cooperatives. **Studies in Agricultural Economics** No. 105: 23-38.

15. **Galbraith**, J. K. (1963): **American Capitalism. The Concept of Countervailing Power.** Penguin Books in association with Hamish Hamilton. (First published in the U.S.A. 1952)

16. **Hakelius**, K. (1996): **Cooperative Values – Farmers' Cooperatives in the Minds of the Farmers.** Uppsala: Swedish University of Agricultural Sciences, Dissertations 23

17. **Hansen**, M. H., **Morrow**, Jr. J. L. and **Batista**, J. C. (2002): The Impact of trust on cooperative member retention, performance and satisfaction: an exploratory study, **International Food and Agribusiness Management Review** 5: 41-59.

18. **Harte**, N. L. (1997): Creeping Privatisation of Irish Cooperatives: A Transaction Cost Explanation. In: J. Nilsson and G. van Dijk (eds.), **Strategies and Structures in the Agro-Food Industries.** Assen: Van Gorcum, 31-53.

19. **Hendrikse**, G. W. J. and **Veerman**, C. P. (2001a): Marketing Co-operatives: An Incomplete Contracting Perspective. **Journal of Agricultural Economics** 52: 53-64.

20. **Hendrikse**, G. W. J. and **Veerman**, C. P. (2001b): Marketing co-operatives and financial structure: a transaction costs economic analysis. **Agricultural Economics** 26: 205-216.

21. **Hódi**, P. (2009): Interview (President of Board of Directors of Mórakert Co-operative), July 2009. (in Hungarian)

22. **ICA** (1995): The International Co-operative Alliance Statement on Co-operative Identity. **Review of International Co-operation** 88 (3): 3-4.

23. **James**, H. S. Jr. and **Sykuta**, M. E. (2005): Property Right and Organizational Characteristics of Producer-Owned Firms and Organizational Trust. **Annals of Public and Cooperative Economics** 76 (2): 545-580.

24. **Jones**, D. C. and **Kalmi**, P. (2009): Trust, inequality and the size of the co-operative sector: crosss-country evidence. **Annals of Public and Cooperative Economics** 80 (2): 165-195.

25. **Karantininis**, K. and **Nielsen**, T. V. (2004): The hold-up problem in "code of practice" by farmer cooperatives. Conference on Vertical Markets and Cooperative Hierarchies: The Role of Cooperatives in the International Agri-Food Industry. M.A.I.Ch., Chania, Greece 3-7 September 2004.

26. **Kyriakopoulos**, K. (2000): **The Market Orientation of Cooperative Organizations.** Assen: Van Gorcum.

27. **McAllister**, D. J. (1995): Affect- and cognitive-based trust as foundations for interpersonal cooperation in organizations. **Academy of Management Journal** 38: 24–59.

28. **MacPherson**, I. (1994): The Co-operative Identity in the Twenty-First Century. A background paper. **Review of International Co-operation** 87 (3): 8-26.

29. **Meulenberg**, M. T. G. (2000): Voluntary marketing institutions in food marketing systems. In: A. van Tilburg, H. A. J. Moll and A. Kuyvenhoven (eds.), **Agricultural Markets beyond Liberalization.** Dordrecht: Kluwer Academic Publishers, 213-233.

30. **Nilsson**, J. (1998a): Agency Theoretical Problems in Cooperatives. International Cooperatives Research Conference: "Values and Adding Value in a Global Context", 13-17 May, Cork, Ireland.

31. **Nilsson**, J. (1998b): The Emergence of New Organisational Models for Agricultural Co-operatives. **Swedish Journal of Agricultural Research** 28: 39-47.

32. **Ollila**, P. (1994). Farmers' cooperatives as Market Coordinating Institutions. **Annals of Public and Cooperative Economics** 65 (1): 81-102.

33. **Ollila**, P. and **Nilsson**, J. (1997): The Position of Agricultural Cooperatives in the Changing Food Industry of Europe. In: J. Nilsson, J. and G. van Dijk (eds), **Strategies and Structures in the Agro-Food Industries**, Assen: Van Gorcum, 131-150.

34. **Oxford Advanced Learners' Dictionary** (2005): Trust. 7th Edition, 1645-1646.

35. **Royer**, J. S. (1999): Co-operative Organisational Strategies: A Neo-Institutional Digest. **Journal of Cooperatives** 14: 44-67.

36. **Røkholt**, P. O. (1999): Strengths and weaknesses of the co-operative form; A Matter of Perspective and Opinion. Paper presented at the ICA International Research Conference, Quebec, 28-29 August 1999 (manuscript).

37. **Røkholt**, P. O. (2000): Co-operative adaptation – Eliminating Weaknesses or Utilizing Strengths? **Review of International Co-operation** 92-93 (4/99 – 1/00): 64-72.

38. **Sodano**,V. (2002): Trust, economic performance and the food system: can trust lead up to unwanted results? In: J.H. Trienekens and S.W.F. Omta (eds.), **Paradoxes in Food Chains and Networks.** Proceedings of the 5th International Conference on Chain and Network Management in Agribusiness and the Food industry. Wageningen: Wageningen University, 2002, 104-115.

39. **Spear**, R. (1999): The Co-operative Advantage. "ICA European Research Conference on Continuity, Transition and Renewal: New Trends in European Cooperation". Weimar, October, 1999.

40. **Staatz**, J. M. (1984): **A Theoretical Perspective on the Behaviour of Farmers' Cooperatives.** Michigan State University, Ph.D. Dissertation.

41. **Sykuta**, M. E. and **Cook**, M. L. (2001): A New Institutional Economics Approach to Contracts and Cooperatives. **American Journal of Agricultural Economics** 83: 1273-1279.

42. **Szabó**, G., **Katonáné Kovács**, J. and **Popovics**, P. (2005): A társadalmi tőke szerepe a vidékfejlesztésben (The role of social capital in rural development). In: A. Jávor (ed.): **A mezőgazdaság tőkeszükséglete és hatékonysága** (Capital requirements and efficiency in agriculture). Debrecen: DE ATC Agrárgazdasági és Vidékfejlesztési Kar, 223-229.

43. **Szabó**, G. G. (1997): Usefulness and possibilities of using the „co-operative identity" concept in economic analysis of co-operatives. **Acta Agraria Kaposváriensis.** 1 (1): 67-79.

44. **Szabó**, G. G. (2002): New institutional economics and agricultural co-operatives: a Hungarian case study. In: S. Karafolas, R. Spear and Y. Stryjan (eds.), **Local Society & Global Economy: The Role of Co-operatives.** Naoussa: Editions Hellin, 357-378.

45. **Szabó**, G. G. (2006a): "Co-operative identity"- a concept for economic analysis and evaluation of co-operative flexibility: The Dutch practice and the Hungarian reality in the dairy sector. **Journal of Co-operative Studies** 39 (3):11-26.

46. **Szabó**, G. G. (2006b): "Co-operative identity": A theoretical concept for economic analysis of the dynamics. **Studies in Agricultural Economics** No. 105: 5-22.

47. **Szabó**, G. G. (2008a): "Co-operative Identity" – a Theoretical Concept for Economic Analysis of the Dynamics of Practical Co-operation. In: I. MacPherson and E. McLaughlin-Jenkins (eds.), **Integrating Diversities within a Complex Heritage. Essays in the Field of Co-operative Studies.** Series of Cooperative Studies, Vol 2. New Rochdale Press: BC Institute for Co-operative Studies, University of Victoria, Victoria BC., 81-108.

48. **Szabó**, G. G. (2008b): Human factor considerations regarding the competitiveness of marketing co-operatives: case of the Hungarian Mórakert Co-operative. 27th International Congress of CIRIEC**,** Sevilla, Spain, 22-24 September 2008. CD-Rom, CIRIEC Espana, ISBN: 978-84-95003-67-6.

49. **Szabó**, G. G. (2009): Successful Producer Owned Marketing Organisations in a Transition Country: Two Case Studies from Hungarian Agribusiness. 113th EAAE Seminar: A resilient European food industry and food chain in a challenging world. Mediterranean Agronomic Institute of Chania (MaICh), Chania, Crete, Greece, September-23, 2009.

50. **Szabó**, G. G. and **Bárdos**, K. (2006): Contracts in agribusiness: A survey in the Hungarian dairy sector. In: J. Bijman, S.W.F. Omta, J.H. Trinekens, J.H. M. Wijnands and E.F.M. Wubben, (eds.): **International agri-food chains and networks. Management and organization.** Wageningen: Wageningen Academic Publishers, 65-80.

51. **Szabó**, G. G. and **Kiss**, A. (2007): Economic substance and legal regulation of porducers' organisations in the Hungarian fruit and vegetable sector. In: R. Chaves, J.L. Monzón, Y. Stryjan, R. Spear, S. Karafolas (eds.), **The future of co-operatives in a growing Europe.** Ciriec Espana – Universitat de Valéncia, 663-681.

52. **Szabó**, G. G., **Török**, T. and **Hanf**, J. H. (2009): Co-operative principles – as a basis and safeguards of trust development in agricultural co-operative marketing and management. EMNet 2009: 4th International Conference on Economics and Management of Networks University of Sarajevo School of Economics and Business, September 3 to September 5, 2009.

53. **Tömpe**, F. (2008):Assessing the magnitude. of social capital in Hungarian farming enterprises and its relations to some of their features. In: I. Szűcs. and M. Farkas Fekete (eds.), **Hatékonyság a mezőgazdaságban (Efficiency in agriculture) (Elmélet és gyakorlat [Theory and Practice])**, Budapest: Agroinform Publisher, 95-104.

54. **Török**, T. and **Hanf**, J. H. (2009): Is Trust Necessary in Supply Chain Networks? First Impressions of Hungarian Examples. Paper for the 19th Annual Food and Agribusiness World Forum and Symposium: "Global Challenges, Local Solutions". Budapest, Hungary, June 20-23, 2009.

55. **van Bekkum**, O. F. and **Van Dijk**, G. (eds.) (1997): **Agricultural Cooperatives in the European Union.** Assen: Van Gorcum.

56. **Valentinov**, V. and **Curtiss**, J. (2005): Towards a Transaction Cost Theory of Organizational Change in Transitional Agriculture. **Eastern European Economics** 43 (5) September-October: 25-45.

57. **Vitaliano**, P. (1983): Cooperative Enterprise: Alternative Conceptual Basis for Analyzing a Complex Institution. **American Journal of Agricultural Economics** 65: 1078-1083.

58. **Wilson**, P. N. (2000): Social capital, trust, and the agribusiness economics. Journal of **Agricultural and Resource Economics** 25 (1): 1-13.

59. **Williamson**, O. E. (1993): Calculativeness, trust, and economic organization, **Journal of Law and Economics** 36: 453–486.

60. **Zwanenberg**, A. (1995): Interview and personal communication. Wageningen.

Using the market opportunities in the food economy's foreign trade – measurement of success based on the potential balance

Wagner, Hartmut[1]

Abstract

This work was aimed at analysing the effects of the sudden food price explosion followed by price crash which occurred recently on the foreign trade of the food economy. Comparison of the balances of the different countries was difficult due to the differences in the absolute dimensions; therefore a new method was introduced. Firstly, with the help of the "food economic foreign trade profile" extent to which the different product categories (divided by main product groups or by degree of processing) contribute to the foreign trade balance of the given country's food economy was examined. In the second step, with the help of "profile indexing", the extent to which the country in question was able to turn to profit the market opportunities offered by the price boom was demonstrated numerically. It can be stated that the foreign trade of the Hungarian food economy is amongst the winners of the price explosion. The balance improved remarkably between the two periods because exports of cereals and oilseeds increased greatly due to the increasing market prices during 2007 and 2008. As regards the performance of the other sectors, Hungary can be however ranked among the losers as a consequence of the decreasing international competitiveness of the production. The assessment has also demonstrated that some of Hungary's direct competitors (e.g. the Netherlands and Germany) were able to make better use of the opportunities.

Keywords

crisis, food products, foreign trade, price explosion, cereals

1. Introduction

While practically no changes occurred in the world market prices of the food economy during the last twenty years, **in 2007** (and, in the case of dairy products and sugar already from the middle of 2006) **a *de facto* explosion occurred in the prices of agricultural produce followed by a price fall of similar extent in the second half of 2008.** The process caused a **price explosion principally in the agricultural commodities, thus leading to sharp increases in the FAO cereal and oilseed price indices.** The price indices of the processed products – especially those of meat products – have followed the movement of the other price indices only with some delay and to a remarkably lower extent (FAO, 2009).

Of the **factors causing the food price boom, the role of the financial capital**, that is speculation on the agricultural world market, can be considered as a serious price increasing, dangerous factor. For example, Erber et al. (2008) approached the effects of the stock exchange on the market of agricultural produce from two directions. Forward deals transacted on these stock exchanges had in the past an effect which rather mitigated price fluctuations, thus better stabilising the commodity markets. This stable situation has been changed by the market penetration of investment groups with large amounts of available money, that is of the so-called "noise traders". Also the **European Commission has analysed the role of speculation in the price development of the food products** (European Commission, 2008). According to this report, the amount of capital flowing onto the markets of agricultural commodities suddenly increased as of the beginning of 2006. Beyond quick development of the derivatives markets, the over the counter trade of the derivative products has also grown by 30% since 2007.

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The role of the cereal prices and of bio-fuels in the price explosion is evaluated in very different ways by the single sources. Prices of cereals are often considered as "pillar prices" in the trade literature, owing to their effects exercised on the producer and consumer prices of other agricultural produce and of foods. Frenz et al. (1988) had already demonstrated that **changes in cereal prices resulted in a higher quantitative change in the production of other produce than those of any other agricultural product.** And, according to experts of the **World Bank** (World Bank, 2008), production of bio-fuels is responsible for **75%** of the global food price increase. By contrast, Banse et al. (2008) **stated that speculative stock exchange investments in cereals for human consumption might directly cause the increase in prices.** According to Schmidhuber (2007), at a crude oil price of USD 60/barrel, the specific price of bio-fuels may become again competitive with crude oil; that means, **the pulling effect of the crude oil price increases demand for bio-fuels** and consequently the prices of related produce. Abbot et al. (2009) have also demonstrated the relationship between the oil price and the demand for bio-fuels. Ethanol and biodiesel were linked as energy substitutes for petrol and diesel, and usage of crops for these biofuels became large enough to influence world prices. In the last half of 2008 crude oil prices fell rapidly, but petrol prices fell faster and further. Low petrol and crude oil prices reduced the expected use of maize for ethanol which, in turn, put pressure on ethanol prices and maize prices. According to **Popp** (2009), ethanol was manufactured from 6% of the sugar beet and 10% of the sugar cane produced, while 9% of vegetable oils was used for manufacturing bio-diesel in 2008. He also stressed that the **production of bio-fuels highly depended on the political objectives of the user countries and on the allocated means.**

There are two theories that may provide further explanation of the outbreak of the crisis. Heady and Shenggen (2008) developed the hypothesis of **"perfect storm"**, according to which "the interaction of several factors might cause a huge conflagration". This means that none of the possible causes analysed above could be held responsible for the crisis in itself, but their aggregate effects might provide a much more probable explanation. The other hypothesis is called "Rational inattention theory" and describes **the often irrational behaviour of the market participants** (Sims, 2005). The model developed by Sims assumes that the participants have only limited capabilities for receiving and processing information when the economy is influenced by shock effect. Therefore, the majority of them are compelled to disregard part of the information when taking decisions. The economic thinking modified in consequence of the crisis **has again emphasised the schools of trade theories better approaching the reality** (Krugmann et al., 2003). As the structure of agriculture has considerably changed during recent decades – agriculture having been traditionally considered as a perfectly competitive market – the new theory supposing imperfect competition and increasing returns to scale became ever more applicable to the trade of agricultural produce too (Koo et al., 2005).

Thus, based on the above-described extreme processes which occurred on the world market, the question emerges, what were the effects of the recent food price explosion and price drop on the agricultural food trade of Hungary and of the other EU Member States. The **purpose of this work**[2] **was therefore the quantitative determination of to what extent Hungary exploited its potential possibilities** in comparison with its main European competitors.

[2] The article has been prepared on the basis of the study: Wagner (ed.): The Impacts of the Crisis on the Foreign Trade of the Hungarian Food Economy in an International Context, AKI 2009/8.

2. Database and methodology

In the analysis of the food economic foreign trade of Hungary and of its competitors, the first 24 main product categories of the internationally standardised HS nomenclature[3] covering the scope of the agricultural and food industrial products were used. In part of the analyses lower levels of aggregation were used: through breaking down to depth of product groups (HS-4), it was possible to differentiate between agricultural commodity production and primary and secondary food industrial processing. Databases of EUROSTAT and of the HCSO have been principally used from the international statistical databases.

Two new indicators were introduced**:** In the food economy' foreign trade of the individual countries, traditionally there are **sectors that contribute in a positive manner to the balance** and there are those burdening it **through imports.** The first new indicator is the **"foreign trade profile of the food economy" (**"**ÉKP"** – as abbreviated in Hungarian language); it shows how many units the single **HS-level main product groups have contributed to the foreign trade balance of the food economy of the country under study.** For example, +1.0 means that the main product group (sector) has yielded net returns in an amount exactly corresponding to the (positive) foreign trade balance of the country's food economy. Based on the foreign trade data, ÉKPs characterising each country years 2002-2004 (i.e. the years preceding the EU accession) and during 2006-2008 were calculated.

With the help of the second new indicator, the **foreign trade profile indexing,** an answer was sought to the question, **what were the reactions of the individual countries to the erratic changes.** The ÉKPs of the selected countries were indexed by the product level monthly price index published by the FAO. Comparing this value with the actual monthly balance data, the divergences provide information on the ability of the country concerned to benefit from the opportunities granted by the profile and by the changes.

Thus, the formula of the **indicator showing the exploitation of the foreign trade potential (KPK)** is as follows:

$$KPK = \Sigma[KE_{(monthly)} - (KE_{(monthly,\ profile\ 2002\text{-}2004)} * \text{FAO price index}_{(monthly)})]$$

where KE stays for the foreign trade balance of the main product group as to the HS nomenclature.

In the case of **net exporter countries,** the **positive value** means that the country concerned was **able to better use the possibilities arising from the market** than might be expected in compliance with the opportunities granted by its profile. A **negative value** demonstrates that the country **performed below its capabilities.** The situation is similar for a **net importer country:** a **positive value** of the indicator shows that the country was able to **better pull through the** import growth due to the price explosion, with less deterioration of the balance, while the **negative value** ranks the country among the **losers of the crisis.**

[3] HS: Harmonised Commodity Description and Coding System, in short: Harmonised System. An internationally recognised and applied categorisation system of the products traded internationally. Annex 1 includes the description of the 24 main categories covering the agricultural and food industrial products.

3. Results

3.1. Development of the food economy's foreign trade in Hungary and of its most important European competitors during the price cycle under study

It turned out from the development of the foreign trade balances of the individual Member States' food economies that of the **large net exporters, the Netherlands, France, Belgium, Poland (and Hungary) were able to increase their positive food economy balance during the period under study while the balance of Denmark deteriorated.** Among the large net importers, **Germany slightly improved its deficit.** The **remaining countries** may be ranked **more or less among the losers of the crisis, based on the development of their food economy's foreign trade balance.**

Hungary

Exports of the Hungarian food economy fluctuated in the years prior to the accession to the EU, increasing only slightly, while it grew continuously following accession. The increase of the imports accelerated during the following years , but it slowed down again after 2006. Consequently, the balance of the food economy's foreign trade continuously deteriorated from 2001, remaining below 1 billion EUR in 2005 and 2006. Since that time, it has shown a continuously improving trend and approached EUR 2 billion in 2008. Considering the averages of the periods of the years 2002 to 2004 and 2006 to 2008, the exports of the Hungarian food economy increased by 62% while the imports increased by 99%; as a result, the balance grew by just 16%.

Analysis of the foreign trade of the Hungarian food economy by degree of processing for the two periods under study demonstrated that the **share of the production of agricultural raw materials** increased remarkably (from 33% to 39%) within the exports, while, **within the imports**, **the ratio of the secondary processed products grew most of all** (from 40% to 48%). As a consequence, the **foreign trade balance of the entire food economy continues to remain highly positive**, even though presenting pronounced deteriorating trends compared to the pre-accession years. The decreasing values have been almost exclusively caused by the falling – and, in 2006-2007, negative – balance of the secondary processed products (Juhász et al., 2009). Figure 1 shows the ÉKP of Hungary.

The foreign trade of the Hungarian food economy has essentially **"four pillars": meat** (HS-02), **cereals** (HS-10), **oilseeds** (HS-12) and **preparations of fruits and vegetables** (HS-20). Upon examining the two periods, it is however obvious that the "construction" is tilting; that is, during the period between 2006 and 2008, the main product group of oilseeds maintained the balance high, while the shares of the other main categories decreased (meat, preparations of fruits and vegetables) or even turned to negative for milk and dairy products.

Of course, the changes of the world market prices also have to be taken into account, as these changes influenced adversely several sectors, but comparison with the international competitors has demonstrated that these sectors in other countries were able to better live through the crisis than in Hungary.

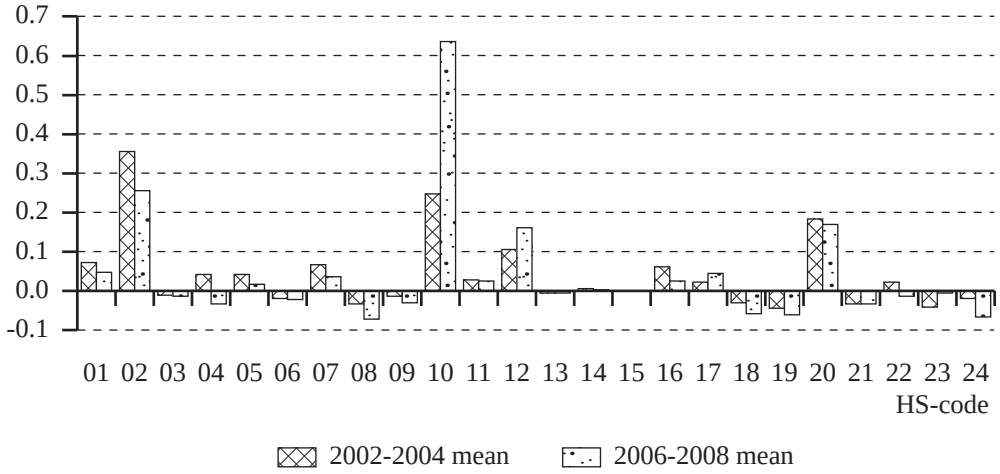

Figure 1: Hungary's average ÉKP in the periods under study
Source: own calculation based on HCSO data

The Netherlands

The Netherlands has a multifaceted food economy, a real great power in foreign trade. Its food economy's foreign trade increased considerably both as regards exports and imports during the period under study. Though the dynamism of import growth exceeded that of the exports, the country's balance of food economic foreign trade increased even during the crisis of 2006-2008. One of the **root causes of the successful development of the food economy's foreign trade lies in the fact that 50% of the European distribution centres are to be found in the Netherlands,** in consequence of the combined effects of several factors. The Netherlands continuously spends important budgetary funds on the development of the distribution sector's infrastructure (road, railway and channel network) and, due to its central location, access to 170 million consumers is granted within a radius of 500 km (Datamonitor, 2005).

The **balanced product structure** constitutes another **factor of the success** of the Netherlands. The food economy's trade balance increased in the average for all three processing levels between the periods 2002-2004 and 2006-2008: by 12% in the agricultural raw material production, by 29% in the primary food processing and by 15% as regards the secondary processed products. This means that the country **was able to maintain its top position not with the help of a "raw material-oriented" export structure (as for example Brazil or the US) but through its well-organised food processing sector.** This is well illustrated by the ÉKP of the Netherlands (Figure 2).

Upon examining the "indentation" of the Dutch ÉKP, it becomes clear that in 19 of the 24 main product categories of the HS the country was able to present positive balances even in the climacteric period of 2006-2008 as well as in 2002-2004. The largest deficit was detected in the main group of cereals and oilseeds; due to the rapid price increase, the balance of the Netherlands has further deteriorated in this product group. Remarkable excess imports were generated also in the group of fruits and in the main category of coffee and tea, that is, in the imports of plants not grown in the Netherlands. However, the negative balance thus generated was by far compensated by surplus of exports in the remaining main product categories. The main product category of plants (HS-06 – including the ornamental plants) is the most salient of them, and contributed more than one quarter

of the positive balance, despite its decreasing share. It is however remarkable that, except for this, there are no other dominant main product groups, implying that in the aggregate **the foreign trade of the Dutch food economy is less sensitive to the market disturbances and price fluctuations that may emerge from time to time in the single main product categories.**

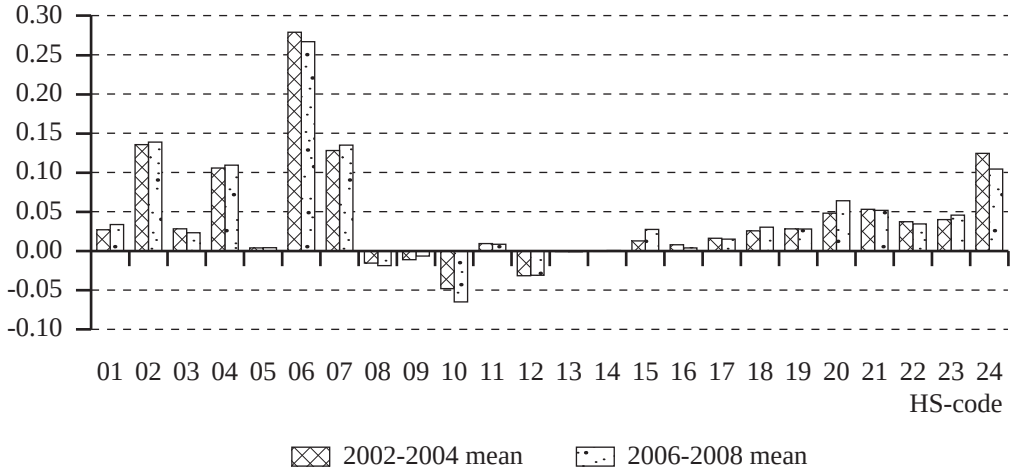

Figure 2: ÉKP of the Netherlands in the periods under study

Source: Own calculations based on Eurostat data

Germany

Germany is the second largest net food importer in the European Union, all the same it was one of the few Member States where the development of the exports was more dynamic than that of imports. In the foreign trade of the German food economy, the amount of the exports almost doubled between 2000 and 2008, while that of imports increased by little more than a half. Thanks to this, the **balance of the German food economy did not deteriorate considerably even in the period 2006 to 2008, furthermore, it improved by 4% in 2008 compared to the previous year.** In the averages of the periods 2002-2004 and 2006-2008, the balance of the German food economy further deteriorated at two processing levels: in the raw material production (by 22%) and in the primary food processing (by 29%), while it turned from negative (EUR -157 million) into remarkably positive (EUR 2,910 million). Like the Netherlands, Germany was able to improve its foreign trade balance of the food economy even during the crisis thanks to its well-organised food processing sector, as also demonstrated by the ÉKP of Germany (Figure 3).

Among the main product groups realising considerable additional imports the fruits (HS-08), vegetables (HS-07), oilseeds and oleaginous fruits (HS-12), preparations of fruits and vegetables (HS-20) and fish (HS-03) have to be mentioned. These main product groups highly contributed to the negative balance during the crisis. In the period 2006-2008, the main group of animal or vegetable fats and oils (HS-15) joined them. By contrast, the balance of the beverages and spirits (HS-22) improved (Figure 19). Positive changes occurred beyond the tobacco products[4] (HS-24), bakery and confectionary products (HS-19) and other edible preparations (HS-21), also in the balance of the main product groups of **meat** (HS-02), **turning from negative into positive** and of dairy products

[4] Like other countries, the German and French statistics rank ever more foodstuffs sole in duty free turnover under the product category HS-24BB, therefore the balance of the main product category increase – not only from tobacco products – by EUR 1.1 billion in Germany and by EUR 2.4 billion in France between the two periods.

(HS-04), improving remarkably. The expansion aspirations of Germany are also demonstrated by the fact that it became the **world's biggest exporter of pork meat** (with export returns approaching EUR 2.7 billion), **overtaking Denmark, in 2008, during the crisis** and its average annual import surplus of EUR 239 million of cheese (HS-0406) between the two periods was replaced by average annual export surplus of EUR 188 million.

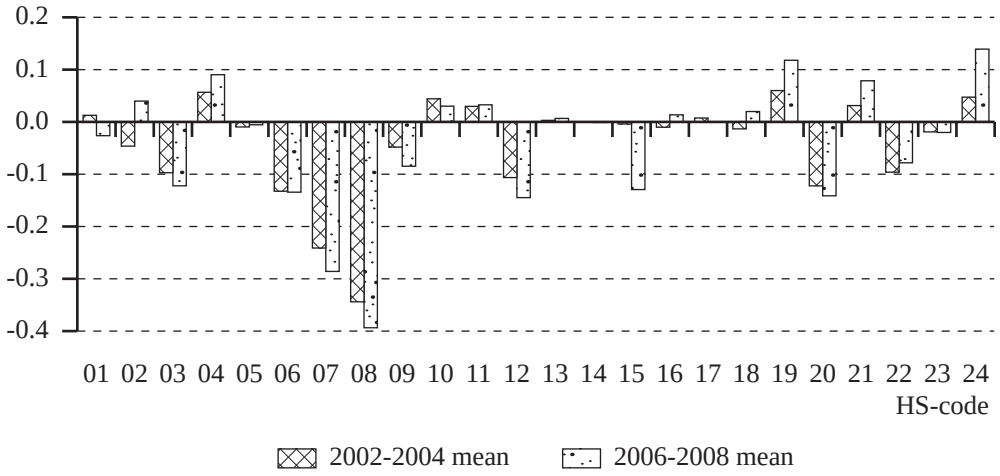

Figure 3: ÉKP of Germany in the periods under study

Source: Own calculations based on Eurostat data

France

During the crisis, France increased its foreign trade balance of food economy mainly due to the production of agricultural raw materials and to secondary food processing. Its exports of foods exceeded EUR 50 billion and the imports EUR 40 billion in 2008. The rate of growth of the exports and imports did not differ remarkably, all the same, in 2006 a significant balance improvement occurred. In the average of the two periods under study, the balance improved by 25% as regards basic material production and by 75% in the secondary processing, while the foreign trade of the primary food processing deteriorated by nearly EUR 1.4 billion, presenting a negative balance. Like the Netherlands and Germany, France was also able to **improve its foreign trade balance of the food economy thanks to the secondary food processing sector**, but also the decreasing competitiveness of the primary food processing is only really shown by the tendencies of the country's foreign trade profile of the food economy.

In compliance with the data, in the average of the two periods under study, the balance of the main product group 22 (beverages) increased by EUR 1.3 billion, that of the main product group 24 by EUR 2.3 billion turning into positive. This was due to the increasing exports of wine and spirits to third countries. Also the fact contributed to this improvement that French statistics – similar to Germany – included the value of the duty free products sold on airplanes and ships into the HS-24BB product category, from 2005. Therefore the balance of the main product category 24 shows favourable trends, but this amount (EUR 2.3 billion on average) should not be taken entirely into account during evaluation of the main product group. **As an exporter of cereals, France gained through the increasing cereal prices during the price explosion**, the positive balance of the sector growing from EUR 3.4 to 4.4 billion. In spite of this, the **share of the sector in the aggregate balance did not increase.** France remained a net importer of fruits and vegetables (HS-07 and HS-08)

and also of preparations of fruits and vegetables. Also its balance of meats (HS-02) became negative, contributing to the negative balance of the primary food processing sector (Figure 4).

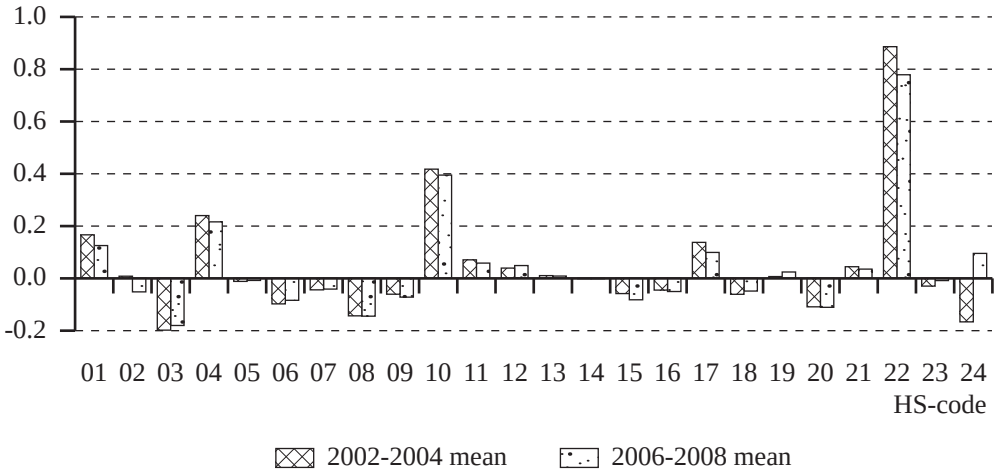

Figure 4: ÉKPs of France in the periods under study

Source: Own calculations based on Eurostat data

3.2. Measuring the performance of the foreign trade of the food economy through profile indexing

The increase of the global demand was powerful in the field of cereals and oilseeds. Starting out from the supposition that the growth of demand makes things smooth for exporters, we examined the **possible** (calculated on the basis of price indices) **and the actual development of the cereals balances** of two EU countries each, being net cereal exporters and net importers by the help of the FAO's cereals price index (Figure 5).

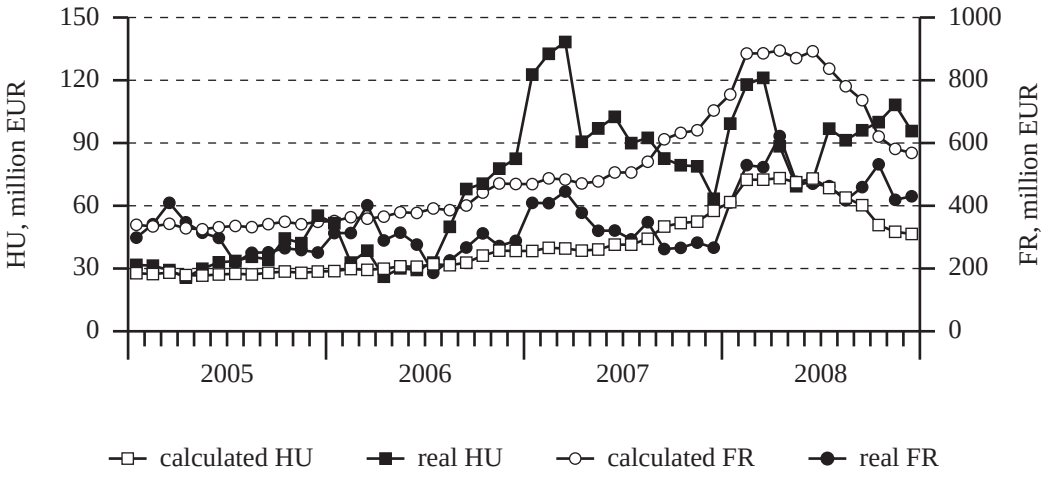

Figure 5: Development of the cereals foreign trade balance of Hungary and France between 2005 and 2008 based on the actual data and as calculated through profile indexing

Source: Own calculations based on data of Eurostat and FAO

On the basis of the resulting values, we have calculated the **indicator showing the degree of exploitation of the foreign trade potential (KPK)** of the two net cereals exporter EU countries – Hungary and France. In the four years under study, **Hungary realised a value higher by EUR 1,327 million** than its calculated potential, while **France performed under its potential by EUR 7,932 million**. In consideration of the actual exports of cereals, **Hungary exported during the four years two thirds more than its calculated path, while France exported one third less.**

Breaking up the overfulfilment[5] of Hungary by years, EUR 380 and EUR 394 million of overfulfilment fall in the period of crisis (2007 and 2008 respectively). However corrected by the maize intervention value (Rieger, 2008) – that is, 4 million tons multiplied by the EUR 180/tonne average export price calculated for the above-mentioned supply period – just EUR 54 million remains of the EUR 774 million overfulfilment for the crisis period.

Splitting the performance of France to the four years concerned, it is clear that the large cereal exporter country was not able to benefit from the crisis' price wave. It exported EUR 2.5 billion less in 2007 and EUR 3.5 billion less in 2008 than its potential. This latter statement becomes really interesting in the light of the fact that the percentage reduction of the cereal production in France was not higher during the crisis years than that of the Hungarian cereal production.

What was the situation on the "other" side, in the **net cereal importer countries**? To determine this, we have examined the possible and the actual trends of the cereal foreign trade balances of two net cereal importer EU countries – **Italy and Belgium** – during the 2005-2008 period, by the help of profile indexing (Figure 6).

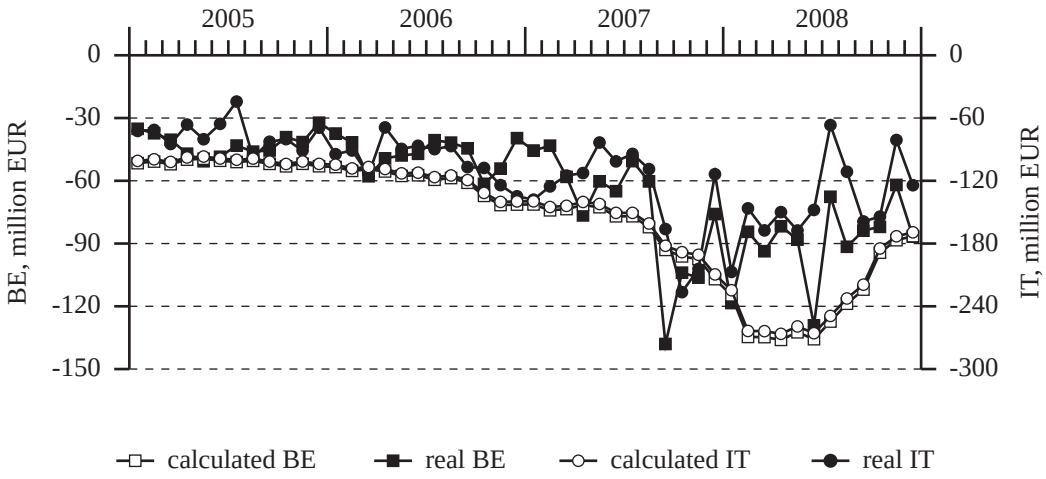

Figure 6: Development of the cereals foreign trade balance of Italy and Belgium between 2005 and 2008 based on the actual data and as calculated through profile indexing

Source: Own calculations based on data of Eurostat and FAO

The calculations have given two surprising results. Firstly, the **coefficient of determination had a higher value for Belgium than in the case of the exporter countries** ($r^2 = 0.79$), but also the value of Italy was relatively high ($r^2 = 0.66$). Except for some fluctuations, the actual curves of

[5] It is important to emphasise that the troubles of the HUF had no major role in the acceleration of the cereal exports until the end of the period under study, because the HUF/EUR exchange rate increased to a remarkable extent only at the beginning of 2009.

the two importer countries – until beginning of 2007 for Belgium and the middle of 2007 for Italy – followed essentially the calculated curve, while thereafter – in the climacteric period – **the negative value of the actual balances decreased considerably, meaning that the Member States under study slowed down their imports.** In the case of Italy, for example, the coefficient of determination of the two curves calculated between 2005 and 2007 was much higher ($r^2 = 0.78$) than that calculated for the entire period. Both **net cereal importer countries tried to parry the high cereal prices**, probably seeking alternative solutions for feeding (e.g. tapioca). Splitting down to the single years the "deficiency" in figures results in savings amounting to EUR 370 million and EUR 1,089 million for years 2007 and 2008 respectively in Italy, while Belgium relieved its negative balance by EUR 80 million and EUR 350 million respectively in the same years. **On the basis of the actual cereal imports, Italy purchased 27% less and Belgium 19% less during the four years under study than was expected on the basis of the curve calculated from the price indices.**

4. Conclusions

On the face of it, Hungary's foreign trade of food economy may be ranked among winners of the price cycle and, within it, principally of the **price explosion.** Its balance improved considerably between the two periods, the exports of cereals and oilseeds increased greatly in 2007 and 2008 owing to the increasing market prices. However, taking into account **the development of the other sectors, Hungary rather belongs to the group of losers, first of all as regards the meat market** (with the exception of the poultry sector), the milk and dairy industry, and due to the **decreasing international competitiveness** of the fruit and vegetable production.

Comparing the **evolution of Hungary's foreign trade in food products with that of its main competitors,** the resulting picture is even more ambivalent. **The Netherlands**, for example, attained a remarkable balance improvement not as a consequence of the rising raw material prices, and furthermore, succeeded in controlling the level of imports when they became more expensive. In the meat sector, even Germany, a net food economy importer, increasingly endangered the foreign market position of Hungary. The **exporters of the countries listed were able to better exploit the price scissor developed as a consequence of the crisis, increasing their market share in spite of the strengthening price competition through their aggressive price policy.** From among the net exporter countries, **France also qualifies as a winner of the crisis, though it was less successful** than the other Member States under study.

In the case of **cereals where there was an excess in demand,** the method of profile indexing demonstrated that **Hungary was essentially able to benefit from the food economy's foreign trade potential** through generating sufficient commodities, while **France did not use** its potential possibilities deriving from its balance. In the case of **cereal importers**, it may be stated in compliance with profile indexing that **reaction to price changes is operable in the importer countries**, resulting in a relatively high correlation between the calculated and real balance indices up to a certain price level, while the substituting factors came into force above a certain threshold.

References

1. **Abbott**, P., **Hurt**, C. and **Tyner**, W. (2008): What's Driving Food Prices?, Farm Foundation Issue Report.
2. **Banse**, M., **Nowicki**, P. and **van Meijl**, H. (2008): Why are current world food prices so high?, LEI Wageningen UR.
3. **Datamonitor** (2005): Agricultural Products in the Netherlands, Industry Profile.
4. **Wagner**, H. (ed.), **Juhász**, A., **Darvasné**, E. and **Tunyoginé**, V. (2009): A válság hatása a magyar élelmiszergazdasági külkereskedelemre nemzetközi összehasonlításban. (Impacts of the crisis to the foreign trade of the Hungarian food economy in an international comparison) Agrárgazdasági Tanulmányok, 2009/8. Budapest, Agrárgazdasági Kutató Intézet.
5. **Erber**, G., **Petrick**, M. and **v. Schlippenbach**, V. (2008): Ursachen und Konsequenzen der steigenden Nahrungsmittelpreise. Wochenbericht des DIW Berlin Nr. 26/2008, 357-363 o.
6. **European Commission – Directorate-General for Agriculture and Rural Development** (2008): High prices in agricultural commodity markets: situation and prospects. Brussels
7. **Eurostat** (2010): Online database, http://epp.eurostat.ec.europa.eu/newxtweb/
8. **FAO-ILO** (2010): Online database, http://laborsta.ilo.org/
9. **FAO** (2009): Food Price Indices (October, 2009), http://www.fao.org/worldfoodsituation/FoodPricesIndex/en/
10. **Frenz**, K. and **Manegold**, D. (1988): Linerares Modell zur Bestimmung von Preis- und Mengenwirkungen einer restriktiven Agrarprolitik in der EG. Brauschweig, Institut für landwirtschaftliche Marktlehre, Arbeitsbericht 88/1.
11. **Heady**, D. and **Shenggen**, F. (2008): Anatomy of a Crisis – The Causes and Consequences of Surging Food Prices, IFPRI Discussion Paper 00831.
12. **International Grains Council** (2009): Grain Market Report 2009 oktober.
13. **Juhász**, A. and **Wagner**, H. (2009): Vélemény – Még pozitív az élelmiszer-külkereskedelem egyenlege. (Opinion – The balance of the foreign trade of foodstuffs remains positive as yet) Világgazdaság, 2009.07.02.
14. **Kartali**, J. (ed.) (2007): A magyar élelmiszergazdasági termelés piaci lehetőségeit veszélyeztető versenytársak várható magatartása. (Expectable behaviour of the competitors endangering the market opportunities of the Hungarian food economy's production) Agrárgazdasági Információk 2007/2, Budapest, Agrárgazdasági Kutató Intézet.
15. **Koo**, W. W. and **Kennedy**, P. L. (2005): International Trade and Agriculture, Blackwell Publishing, UK.
16. **Krugmann**, P. R. and **Obstfeld**, M. (2003): Nemzetközi gazdaságtan (International economics), Budapest: Panem Kiadó
17. **Marktstudie Italien ZMP** (2005): Lebensmittelhandel und Exportchancen, Zentrale Markt- und Preisberichtstelle GmbH, Bonn.

18. **Popp**, J. (2009): Tension between the 4 F's: Food – Fibre – Fuel – Feed. Global Challenges – Regional Solutions, 19th Annual World Forum & Symposium, Budapest, June 20th-23rd 2009

19. **Rieger**, L. (2008): A PAIR piaci árai a tőzsdei, valamint az uniós minimum és értékesítési átlagárai tükrében. (Market prices of the PÁIR – Market Price Information System of AKI – compared to the stock exchange prices and to the EU minimum and average sales prices) Előadás a PAIR szakmai napon, AKI, 2008. szeptember 16.

20. **Schmidhuber**, J. (2007): Impact of an increased biomass use on agricultural prices, markets and food security. Wageningen Seminar in Bioenergy. Wageningen University and Research Centre.

21. **Sims**, C. A. (2005): Rational inattention: a research agenda. Deutsche Bundesbank Series 1: Economic Studies, No. 34/2005.

22. **World Bank** (2008): Rising food prices: Policy options and World Bank response. Background information

Annex 1

Harmonisation System Codes Commodity Classification from Chapter 01 to 24 (agricultural products and foodstuffs)

HS code	Description
1	Live animals
2	Meat and edible meat offal
3	Fish and crustaceans, molluscs and other aquatic invertebrates
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included
5	Products of animal origin, not elsewhere specified or included
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage
7	Edible vegetables and certain roots and tubers
8	Edible fruit and nuts; peel of citrus fruit or melons
9	Coffee, tea, maté and spices
10	Cereals
11	Products of the milling industry; malt; starches; inulin; wheat gluten
12	Oilseeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder
13	Lac; gums, resins and other vegetable saps and extracts
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates
17	Sugars and sugar confectionery
18	Cocoa and cocoa preparations
19	Preparations of cereals, flour, starch or milk; pastrycooks' products
20	Preparations of vegetables, fruit, nuts or other parts of plants
21	Miscellaneous edible preparations
22	Beverages, spirits and vinegar
23	Residues and waste from the food industries; prepared animal fodder
24	Tobacco and manufactured tobacco substitutes

Source: HCSO

Examination of the consumers' ethnocentrism and products' origin in the case of Hungarian foodstuffs

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Horváth, Ágnes[2]
Lehota, József[2]

Abstract

'Consumer ethnocentrism' is defined as consumers' beliefs about the appropriateness or morality of purchasing domestic and foreign-made products. As a consequence of the influx of foodstuffs of dubious origin into Hungary and the increasing number of food scandals, demand for Hungarian foodstuffs of reliable origin has increased. Consumers, however, do not necessarily acquire information from the most reliable sources in the course of purchasing and most of them are not fully aware of what the trademarks featured on the various products mean. Our questionnaire survey sought answers to the questions of how respondents regard Hungarian products and what segments can be distinguished from the aspect of their attitudes concerning Hungarian products. We distinguished four consumer groups – with the aid of cluster analysis – in terms of the factors affecting their choices between Hungarian and imported products when buying foodstuffs, and in terms of their overall attitudes to Hungarian products which appears also in the knowledge of origin labelling.

Keywords

consumer ethnocentrism, Hungarian food products, trademarks, questionnaire survey, cluster analysis

1. Introduction

The negative impacts and effects of globalisation have triggered a great variety of processes and efforts to counter its progress all over the world. One of these is referred to as *localisation*, a process of increasing appreciation of all types of locality (regions, sub-regions, micro-regions etc.). The value of the individual's immediate environment, local characteristics and traditions increases as a result of the process of localisation (Petrás, 2005).

People's need for expressing national identity as well as their increased sensitivity to risks strengthen consumers' ethnocentric feelings. Sumner (1906) defined ethnocentrism as "people's inclination to regard their own groups to be the 'centre of the universe', judging other groups from their own perspectives" (Balabanis et. al., 2004).

Malota (2003) distinguished three dimensions of the ethnocentric feelings in a broader sense:

- Positive ethnocentrism (patriotic feelings): it has positive impact on evaluation of national products and it has no influence, or it has positive impact, on the evaluation of foreign products.
- Negative ethnocentrism (nationalism): it has a positive impact on judgements of national products and a negative impact on foreign products.
- Cosmopolitism: a third dimension of nationalism in its broader sense, comprising positive attitudes relating to other nations. It has no considerable influence on the evaluation of national and foreign products.

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Malota's surveys among Budapest residents showed that Hungarians are characterised predominantly by patriotic sentiments, along with some measure of territorial nationalism and feelings of being superior. Those proclaiming territorial nationalism assert that all Hungarians should be living in Hungary, while superiority relies on the belief that Hungarians are the best and greatest and Hungary is the best country in the world. Few respondents were found to be characterised by cosmopolitism (Malota, 2004).

The concept of consumer ethnocentrism was defined by researchers scrutinising issues of country-origin image, as follows: consumers' beliefs about the appropriateness or morality of purchasing foreign-made products (Shimp and Sharma, 1987; in Javalgi et al., 2005) Ethnocentrism may have a strong impact on products' country-origin image, if there is a scarcity of other available information (Chasin et al., 1993).

Lehota (2001) argued that ethnocentrism is a form of 'cultural closedness': it is the consumer's belief that purchasing imported goods is not right because it results in losses for the national economy.

Horváth et al. (2006) outlined the value-based product and service development techniques determining the nutrition habits of today's consumers. Foodstuffs that can be associated with places of origin embody a variety of values so they appear in a variety of trends. The trend called 'Slow Food' involves national specialities adopted in all regions of the world. The values of health and ethics appear in the 'D.O.C. food' trend, the main element of which is an interest in foodstuffs qualifying as rarities, those that are indigenous or are gradually disappearing in the given area. This shows a growing interest in authentic foodstuffs of controlled origin (e.g. regional specialities) and a growing rejection of foodstuffs of dubious origin. Ethical values appear in what is referred to as 'ethical food'. One typical example is products bearing the 'Fair Trade' logo identifying products originating from disadvantaged countries. Skuras and Dimara (2004) argue that the increased demand for healthy foodstuffs from traceable and authentic sources is the main motivating factor leading consumers to giving preference to national or regional and traditional foodstuffs.

Marking (labelling) foodstuffs is an element of food safety The advantages and positive features of products can be communicated to consumers with the aid of any of the elements of the marketing-mix. However, a trademark system meeting the following criteria provides more authentic information;

- it is based on clearly defined requirements;
- an independent supervisory body ensures that the requirements are met;
- the supervisory body is owned by the state or it is controlled by an authority;
- the fact that control mechanisms are applied is proven by a clearly identifiable label, trademark or logo.

Although many consumers lack background information required for understanding some of the details, the markings featured on labels attached to foodstuffs are important for Hungarian consumers, in particular for more highly educated and middle-aged ones. One generally observed trend is that the place of origin and trademarks and other markings proving this have grown in importance (Bánáti-Popp, 2006). Pallóné (2007) also asserted that the reason for the introduction of an increasing number of trademark systems – including geographical indications and markings of origin – is because food safety is gradually becoming a factor in competition. There are a lot of trademarks in Hungary too, in proof of domestic quality. Many consumers, however, do not know what the various logos mean and what criteria products are expected to meet if they are to be entitled to bear the trademark concerned and which marking provides reliable information concerning their origin.

Another important question to be clarified is what consumers consider to be Hungarian products, i.e. what criteria need to be met by a product to qualify as a 'Hungarian product'. Totth (2009) asserted that marketing strategy building may be complicated by the differences between the attitudes of different consumer groups within the Hungarian society towards Hungarian products, which may depend on ethnocentrism as well as on the heterogeneous image of products. Other questions are raised by the fact that while a large proportion of consumers declare that they prefer Hungarian products, they do not select Hungarian products in their actions and in actual purchasing situations. One reason for this may be Hungarians' price sensitivity.

Szabó (2006) compared the country-of-origin image of Hungarian and imported foodstuffs from the older EU countries. Three clusters were distinguished in the course of the analysis. The committed consumers to the Hungarian food products were 15.6% of the sample. According to the 52.6% of the respondents, in some attributes the domestic foods, and in others the imported foodstuffs, were better. 31.8% of the sample slightly preferred the imported products. Apart from the producer's availability the more preferred flavour is the most important benefit of the Hungarian products for all clusters.

In a series of opinion polls carried out by Ipsos Zrt. in 2009, some 52% of Hungarian consumers preferred Hungarian products when they have a choice. Particular emphasis is laid on meat and processed meat products, milk and other dairy products and fruits and vegetables. A total of 40% of the respondents said their decision on whether to prefer the Hungarian or the imported product depends on the type of product itself. Only 8% of consumers said that they do not prefer Hungarian products. As a consequence of the economic crisis some 20% of the respondents said that they purchased Hungarian products more often, 69% of them preferred Hungarian products to the same extent while 11% of them have purchased Hungarian products less frequently since the outbreak of the crisis (Ipsos Zrt., 2009).

According to a Gfk's Shopping Monitor 2008-2009 Hungarian consumers continue to regard quality as the most important criterion when shopping for foodstuffs despite the economic crisis, while price has been steadily in second place since 2003. In comparison to the findings of a 2006 survey, expectations concerning the presence of Hungarian products in the shops have grown somewhat stronger, which may be an indication of a desire to support the Hungarian economy (Gfk, 2009A). According to a survey conducted by Ipsos Zrt. however, price is the most important factor for consumers when shopping for foodstuffs, followed by quality, promotional campaigns and the favoured taste. The origin of the product is the fifth highest priority (Ipsos Zrt., 2009).

An oral survey by Lakner et al. (2000) was conducted with 182 persons in 1998. The respondents had to evaluate the importance of 13 food buying criteria on a 1-5 scale. Connected with the origin and quality indicators, the following criteria were mentioned: producer country, producer region, trademark, quality logo. From among the criteria the trademark and the quality logo are moderately important, the average score of the producer country was 3.2 and the role of the producer region was even lower (2.36).

Szakály (2009) argued that Hungarians are characterised by patriotic attitudes and sentiments but from the aspect of consumer ethnocentrism contradictions are observed between attitude and actual consumer behaviour. He assumes that a Hungarian consumer favours collective values by preferring domestic products as long as it does not cost him an extra Forint. This is why a much smaller proportion of Hungarian consumers will choose domestic products when actually purchasing products, than when they are asked about their preference for Hungarian products. Their research has shown that if the domestic food product costs just as much as its imported equivalent, as many as

76.8% of the respondents would choose the Hungarian product, while if the Hungarian product costs more than the imported item only 25.3% of them would do the same. If the higher-priced Hungarian food product carries a Hungarian trademark the percentage of those who would prefer the Hungarian product would only be higher by some 6%. These findings show that although the majority of Hungarian consumers have patriotic attitudes, their shopping decisions are determined primarily by the prices of products.

Some two thirds of Ipsos Zrt's respondents noted that it is difficult to distinguish Hungarian products from imported ones. The packaging indicates the place of origin and about 85% of the respondents considered that this was an adequate source of information. Brand names and product names contribute 31% and 21% to identification, respectively. A survey conducted by Ipsos Zrt revealed that 77% of the respondents consider items made from or of Hungarian ingredients to be Hungarian products, while 58% of them said that products to which the relevant trademarks are attached qualify as domestic. Other criteria included whether the given product is manufactured by a company in Hungarian ownership (47%) and whether it qualifies as a traditional product (39%) (Ipsos Zrt., 2009).

The publication in 2009 of the Code of Ethics on the Food Production Chain (Élelmiszer Termékpálya kódex) eventually resulted in an agreement on what criteria should be met by a product for it to be considered Hungarian. The definitions include the following: products – such as fruits and vegetables – delivered from the producer right to the shop must qualify as Hungarian. Moreover, the raw materials of so-called homogeneous products (made from a single component), such as cheese products, must also originate from Hungary. Products made from multiple components must be made in Hungary and the components must include some produced in Hungary (Code of Ethics on the Food Production Chain, 2009). Accordingly, the Code of Ethics on the Food Production Chain highlights Hungarian raw materials and Hungary as a place of production or manufacture as criteria to be met for a product to qualify as Hungarian. On the other hand, logos indicating the product's being of a 'Hungarian' nature lay more emphasis on high quality, Hungarian production or distribution, rather than on Hungarian raw materials, while the indications of origin used in the EU are still less widely known in Hungary. The first three digits of the product identifying bar code (599) is the manufacturer's identifier referring to Hungary's product identification office, which may be assigned to imported foodstuffs as well (Légrády, 2009).

2. Research objectives and methodology

The main goal of the research was to identify the characteristics of the most common trends in food consumption among Hungarian consumers, i.e. whether any relevant shift among the key components of consumer behaviour can be identified in domestic demand as well. In order to accomplish the key objective of our research we aimed to find answers and solutions to the following questions in the course of the survey discussed in this paper:

- What views are held concerning Hungarian food products by consumers, according to the opinions of people doing their shopping in a Hungarian-owned and those buying foodstuffs in a foreign-owned store chain
- What considerations can be identified as having an impact on consumers' choice when purchasing Hungarian food products and what consumer groups can be distinguished on the basis of such differences
- What correlations can be identified between ethnocentric attitudes and preference of Hungarian foodstuffs among customers of a domestic and a foreign-owned store chain

- What factors respondents regard to be criteria characteristic of Hungarian product attributes
- What sources of information customers rely on in order to identify domestic products
- We assume that consumers with more ethnocentric and patriotic attitudes will have more positive views of Hungarian foodstuffs and that the patriotic attitude will affect their actual search for information when shopping for foodstuffs, which will lead to better knowledge of the sources of information revealing products' places of origin

The survey took place in the Cora hypermarket near the town of Fót and in the CBA Príma supermarket in the town of Szada in the summer of 2008 and in the spring of 2009. Both stores are located near to Budapest. Cora Hypermarket is located beyond the town and the CBA supermarket located on the edge of the town. Forty of the total of 2,400 units of the CBA chain – including the one in Szada – belong to the top category of shops, with an adequately wide choice of products and sophisticated interiors. Both chains of stores lay particular emphasis, in both their marketing strategies and in terms of the composition of their product ranges, on ensuring that their offer is dominated by domestic products. CBA even features its being 'The Hungarian chain of stores' as one of the most important elements of its communication.

The two chains of stores are hugely different in terms of their respective ownership structures, thus the results and conclusions of the surveys make it possible to compare the respective opinions of the customers of the chain in 100% Hungarian ownership (CBA) to those of consumers of the foreign owned hypermarket chain (CORA). The difference between the two types of stores (hypermarket and supermarket) could, in principle, affect the interpretation of the findings. Since CORA is a hypermarket with a very large floor area we sought to select a CBA shop that does not differ much from a hypermarket at least in terms of the width and depth of the food products on offer. The CBA shop in Szada is a supermarket of a large floor area, located on the edge of the town, with a wide range of products where consumers do their shopping to stock up for longer periods as in a hypermarket.

The method of the survey was personal interviews in the shops concerned, using standardised questionnaires. All consumers doing their shopping in the stores at the time were regarded as the 'basic population' in the course of the interviews. The individuals in the sample were selected by way of personally approaching and asking one in three consumers to answer our questions. The data were processed with the aid of the SPSS 16.0 software. It is important to emphasise that the presented examinations provide a preliminary review only, because of the size and composition of the sample; general conclusions for the total population can only be drawn in limited dimensions. In interpreting the results attention should also be paid to the fact that Hungary was hit by the global economic crisis during the period between the two surveys: e.g. according to the findings of surveys carried out by Gfk. Hungária the proportion of people preferring Hungarian products increased slightly from 64% to 68% (Gfk, 2009B).

The first question in our questionnaire was aimed at identifying consumers who take the place of origin of the product into account when they shop for food products and who prefer Hungarian products. The second group of questions was aimed at identifying the general image of Hungarian foodstuffs. (The product attributes were evaluated on the five point Likert scale). The third question comprised five statements aimed at exploring the considerations motivating those preferring Hungarian products (using the five point Likert scale). The fourth question was asked to clarify the criteria to be met by a product if it is to qualify as Hungarian according to the respondents. The fifth question was an open question, asking consumers about the types of information they taken into account in trying to identify Hungarian products, while the sixth question was asked in order to

see how widely known certain sources of information were among consumers. Each of the fourth and the sixth question was a multiple-choice question where the respondent could pick one or more of the possible answers offered by the interviewers. Since a logo is a visual type of information, in testing logo awareness we showed the logos in question to the respondents.

Descriptive statistics were used in our analyses together with the K-mean cluster analysis method and, for describing the segments, we used cross-tables. Chi^2 test was applied for the significance examination (sig: $p \leq 0.05$). The interpretation of the cross tables was aided by adjusted standardised residuals (Adj.R) showing the difference in comparison to the expected values calculated on the basis of marginal distributions. (Adj.R >= 2: with 95% reliability, difference in positive direction can be experienced, related to the expected value. Adj.R >= 3: with 99% reliability, difference in positive direction can be experienced, related to the expected value. In case of negative numbers, in the same value-intervals, related to the expected value, the direction of the difference will be negative).

3. Results and discussion

The sample

197 (N1) and 190 (N2) questionnaires were filled out in the course of the survey in the Cora Hypermarket and in the CBA supermarket, respectively. The distribution of the sample is illustrated in Table 1.

Table 1

The distribution of the sample %

		CORA	CBA	Total
Gender	Female	80.7%	66.3%	73.6%
	Male	19.3%	33.7%	26.4%
Age	< 18 years	1.0%	2.1%	1.6%
	18-30 years	20.3%	12.1%	16.3%
	31-45 years	44.2%	19.5%	32.0%
	46-60 years	27.4%	38.9%	33.1%
	61 years <	7.1%	27.4%	17.1%
Marital status	single	22.8%	17.9%	20.4%
	married	26.9%	43.7%	35.1%
	married, with children	50.3%	38.4%	44.4%
Educational level	primary	2.5%	10.5%	6.5%
	secondary	39.6%	45.8%	42.6%
	tertiary	57.9%	43.7%	50.9%
Net per capita income*	< HUF 60,000 (< Euro 222)	9.1%	21.6%	15.2%
	HUF 61-100,000 (Euro 223-370)	42.6%	51.6%	47.0%
	HUF 101-150,000 (Euro 371-555)	24.9%	18.4%	21.7%
	HUF 151-200,000 (Euro 556-740)	10.7%	7.4%	9.0%
	HUF 200,000 < (Euro 741 <)	12.7%	1.1%	7.0%

* Net income per capita in the family. Calculated with 270Ft/Euro.
Source: authors' own research, N1 = 197, N2 = 190 (2008-2009)

Since shopping is done predominantly by women and since they are the primary target group of the stores in question, women are over-represented in the sample. Middle-aged customers accounted for a higher percentage of the sample than of the national average. In the case of the Cora hypermarket those aged between 31 and 45 years, in the CBA supermarket those aged between 46 and 60 as well as those over 60 years of age make up the highest percentages of the sample. People with average or slightly over the average income made up the bulk of the sample. However, among Cora customers there was a higher percentage of people with higher than average income, while more lower than average income earners were found among CBA customers.

Evaluation of the characteristics of Hungarian foodstuffs

One of the key objectives of our research was to scrutinise Hungarian consumers' opinion of Hungarian food products, therefore we tested the extent to which respondents think the attributes listed in Table 2 are characteristic of Hungarian food products. Because our aim was to determine the image of the Hungarian foodstuffs as perceived by the consumers, we did not explain the listed attributes in detail. Most of the product attributes listed in the table were assigned medium or slightly higher than medium scores, with high relative variance rates. Accordingly, the mean resulted from very low or very high scores, indicating that consumers are strongly divided in terms of their views of the various product attributes. Most respondents said that the most typical characteristic of Hungarian food products is that they are rich in taste and flavour (4.02). This was the attribute featuring the lowest variance so this is what customers agreed on most of all. The least typical characteristic of Hungarian food products is that they are unhealthy; however, a fairly high relative variance rate was found in this aspect (0.42), i.e. the respondents' opinions were deeply divided in this regard.

Table 2

Evaluation of the characteristics of Hungarian foodstuffs

	Mean	Std.Dev.
good price to value ratio	3.37	1.02
available manufacturer	3.57	1.08
adequate food safety	3.67	0.96
rich in taste / flavour	4.25	0.84
'trendiness'	3.61	0.96
less attractive packaging in comparison to that of imported products	3.07	1.31
not easy to identify as really originating from Hungary	3.10	1.25
there is enough information on the label	3.78	1.08
less/fewer additives	3.03	0.96
unhealthy	2.38	1.01
scarcely advertised	3.20	1.29
less broad product ranges on offer than those of corresponding imported products	3.30	1.23
excellent quality	3.92	0.81

Source: own research (2008-2009), N = 387 (1-5 scale, where 1 = does not apply at all; 5 = fully applies)

Description of the food consumer groups

Our analysis of the data on the attributes of Hungarian food products revealed major differences in terms of customers' opinions on the various product components, as were indicated by the fact that the mean figures resulted from relatively high variances. To distinguish different consumer groups we performed cluster analysis with the aid of the K-means method. Variance analysis showed significant differences between at least two segments in terms of every product attribute. The findings of the survey lead to the forming of four segments, two of them with positive, the other two with negative attitudes to Hungarian products. The segments so identified are examined first on the basis of the product attributes involved in factor analysis, in the course of which the mean scores of the various clusters are compared to the sample mean (Table 3):

A: 'Consumers with strong negative attitudes towards Hungarian products': Customers in this group held the most negative views of Hungarian foodstuffs in comparison to the sample mean. They rated attributes associated with trendiness, quality and the proximity of the manufacturer lowest among all segments. Their evaluation of marketing activities apart from pricing (narrow range of choice, less attractive packaging, scarcity of advertisements) was close to the sample mean. On the whole, therefore, they are characterised by a negative attitude and disinterestedness with regard to Hungarian products.

B: 'Consumers with positive attitudes towards Hungarian products for safety considerations': The key advantage of Hungarian food products for members of this segment is safety: the main attributes include adequate food safety, available manufacturer and reliable label information. The members of this group of consumers identify the weakness of marketing, narrow product ranges and less attractive packaging as the main shortcomings concerning Hungarian food products.

C: 'Consumers with positive attitudes, biased towards Hungarian products': The respondents in this group held positive views of all product attributes and noted no shortcomings in regard to Hungarian products. They appreciated traditional product attributes most highly, including that Hungarian food products are rich in taste and flavour, excellent quality, trendiness and good price-value ratio. They assigned the lowest rating to the statement of Hungarian foodstuffs being unhealthy and they also consider the elements of the applied marketing mix to be adequate.

D: 'Consumers having no trust in and characterised by negative attitudes towards Hungarian products': The members of this segment noted the difficulties in identifying the Hungarian nature of the products concerned as being the key shortcoming of Hungarian food products and they rated the healthiness of such products lower than the sample mean. They rated conventional product attributes (rich in taste/flavour, excellent quality, trendiness, good price-value ratio) somewhat lower than the sample mean, just like the attributes relating to safety. The negative rating in this group is likely to result from difficulties of identification: customers are not really sure that some products are actually of domestic origin.

The various segments of food consumers cannot be clearly described in terms of the basic variables, thus the dominant differences between the groups are identified in terms of the descriptive variables. The statistically most significant correlations in terms of basic variables were identified in regard to income levels. Correlations with income is identified in group **'B'** (positive with low income and negative with high income) according to the standardised residuals, i.e. this segment comprises mostly people with incomes falling between 223-370 Euro. Group **'C'** comprises a higher proportion (14.8%) of people with higher (Euro 556-740) incomes than the percentage made up by people earning this much in the entire sample. Notable correlation was found in group **'A'** in regard

to qualifications, this group comprising a higher than average percentage of people with secondary qualifications. From the aspect of age groups mention should be made of the fact that middle-aged persons (aged between 31 and 45 years) make up a smaller proportion of group **'B'** – the segment of those striving for safety – than the sample average.

Table 3

The segments formed on the basis of the views taken of the attributes of domestic products

Attributes	Sample mean	A	B	C	D	Sig. (p < 0.05)
	N = 387	N = 83	N = 82	N = 122	N = 100	
rich in taste/flavour	4.25	3.63	4.56	4.63	4.06	A-B, A-C, A-D, B-D, C-D
trendiness	3.61	2.96	3.76	4.01	3.54	A-B, A-C, A-D, B-C, B-D, C-D
excellent quality	3.92	3.45	4.15	4.29	3.68	A-B, A-C, A-D, B-D, C-D
unhealthy	2.38	2.75	1.98	1.94	2.94	A-B, A-C, B-D, C-D
adequate food safety	3.67	3.08	4.17	3.89	3.50	A-B, A-C, A-D, B-C, B-D, C-D
less wide product ranges in comparison to corresponding foreign products	3.30	3.40	4.02	2.42	3.71	A-B, A-C, A-D, B-C, B-D, C-D
less attractive packaging in comparison to foreign products	3.07	2.94	4.18	1.85	3.76	A-B, A-C, A-D, B-C, B-D, C-D
scarcity of advertising	3.20	2.35	3.33	2.89	4.17	A-B, A-C, A-D, B-D, C-D
available manufacturer	3.57	2.94	4.13	3.80	3.34	A-B, A-C, A-D, B-D, C-D
good price-value ratio	3.37	2.99	3.57	3.75	3.08	A-B, A-C, B-D, C-D
difficulties in the identification of whether the product is actually Hungarian	3.10	3.23	2.45	2.54	4.19	A-B, A-C, A-D, B-D, C-D
adequate information on the label	3.78	3.02	4.55	4.04	3.47	A-B, A-C, A-D, B-C, B-D, C-D

Source: own research 2008-2009. N = 387 One-Way ANOVA sig. < 0.05, Test of Homogeneity of Variances sig. < 0.05 – Post Hoc Tests Tamhane (sig. < 0.05), sig. > 0.05 – Post Hoc Tests LSD (sig. < 0.05), Classify = K-Means Cluster, Number of Clusters = 4, Maximum Iteration = 20, Convergence Criterion = 0, Missing Values = Exclude Cases Listwise).

Cora and CBA customers make up 51% and 49% of the total sample. No statistically identifiable correlation was found between the choice of store and the segment to which a particular consumer is assigned. One trend was observed however: Cora customers make up a larger percentage of groups **'A'** (56.6%) and group **'D'** (58%) – the groups with more negative attitudes – than the percentage they account for in the whole sample, while CBA customers make up a higher percentage of groups **'B'** (56.1%) and group **'C'** (54.1%) – the groups with more positive attitudes – than their percentage in the whole sample.

In evaluating information taken into account when choosing from among products, Hungarian food consumers attach importance to the products' origin: 698 % of them take the foodstuffs' place of origin into account and 68.7% of them favour Hungarian products. (The group of those looking out for the place of origin and the group of those preferring Hungarian products were made up of respondents who answered the relevant questions by 'frequently' or 'always'). There is a significant correlation between the two groups ($Chi^2 = 0.00$), so it was safe to conclude that those checking the place of origin of products give preference to products originating from Hungary.

The differences among the segments established on the basis of the views taken of domestic foodstuffs in regard to consumer ethnocentrism were also examined during the survey (Table 4). The cross table was analysed with the aid of the established segments and the answers given by ethnocentric respondents. The group characterised as 'Checks the place of origin' was made up of the respondents who answered these questions by 'always' or 'frequently', while the group defined as 'Prefers Hungarian products' was made up of those answered '4 – agrees for the most part' or '5 – fully agrees'.

Table 4

Description of the segments from the aspect of ethnocentrism

Importance of place of origin	A	B	C	D	Total sample
Checks the place of origin (sig. = 0.00)	53% Adj.R. = -3.8	81.7% Adj.R. = 2.7	80.3% Adj.R. = 3.1	61% Adj.R. = -2.2	69.8%
Prefers Hungarian products (sig. = 0.00)	53% Adj.R. = -3.5	81.7% Adj.R. = 2.9	83.6% Adj.R. = 4.3	53% Adj.R. = -3.9	68.7%
Statements concerning consumer ethnocentrism					
It is patriotic to buy Hungarian products. (sig. = 0.00)	49.4% Adj.R. = -3.6	67.1%	79.5% Adj.R. = 3.8	63.0%	66.1%
It is important that Hungarian consumers should prefer Hungarian products. (sig. = 0.00)	75.9% Adj.R. = -3.0	89.0%	94.3% Adj.R. = 3.2	82.0%	86.0%
I like traditional brands and products. (sig. = 0.00)	74.7% Adj.R. = -3.1	87.8%	92.6% Adj.R. = 2.8	83.0%	85.3%
Special local products are growing more and more important as a counter-reaction to globalisation. (sig. = 0.01)	51.8%	56.1%	63.9% Adj.R. = 2.6	43% Adj.R. = -2.6	54.3%
I help Hungarian farmers by purchasing their produce/ products. (sig. = 0.00)	77.1% Adj.R. = -3.7	91.5%	95.9% Adj.R. = 3.1	87.0%	88.6%

Source: Own research (2008-2009) N = 387 Nominal scale. Attributes = clusters. Chi^2, Adj.R. = adjusted standardised residuals, % = column percentage, the proportion of the examined variable in the cluster.

In the case of **A: 'Consumers with strong negative attitudes towards Hungarian products'** the adjusted standardised residuals reflect a strong negative correlation with the preference for Hungarian foodstuffs, along with all of the statements applying to ethnocentrism. The respondents belonging to this segment are not interested in a product's place of origin and they do not prefer

domestic products when shopping for food. The adjusted residuals also have a strong negative correlation with the statements concerning the purchasing of Hungarian food products. The negative rating of the statements pertaining to ethnocentric behaviour shows that the members of this group are lacking in patriotic feelings, so their choice of products is not affected by any strong feeling of national identity. This negative attitude probably influences their views of the attributes of the products as well, as is indicated in the significant down-rating of the product attributes in comparison to the sample mean.

In the case of **B: 'Consumers with positive attitudes towards Hungarian products for safety considerations'** the survey revealed a strong positive relationship between one's being concerned about the place of origin of a product and one's preference for domestic products. Accordingly, the consumers assigned to this group attach importance to the place of origin of products and they make no secret of their preference for Hungarian foodstuffs. There is no such clear correlation in regard to the attitude relating to consumer ethnocentrism. The ratings of the statements relating to the description of patriotic feelings are more or less equal to the sample mean in this segment. Accordingly, the positive attitude towards Hungarian products does not stem from a characteristic ethnocentric behaviour and their choice of products is motivated by other factors. Since the members of this segment over-rated the product attributes pertaining to the quality and safety of Hungarian products it may be assumed that preference of Hungarian products is a result of food safety considerations and of commitment to traditional products.

Members of **C: 'Consumers with positive attitudes, biased towards Hungarian products'** show the most definite ethnocentric attitudes. They are characterised by strong positive correlations with all such statements, particularly the rating of the statement pertaining to patriotism. Accordingly, this group is made up of openly patriotic respondents holding positive opinions concerning Hungarian foodstuffs in terms of their preferences as well. Probably as a result of their patriotism, these customers are positively biased towards Hungarian products, for they marked no shortcomings from the aspect of product attributes.

The negative attitude – towards Hungarian food products – of the consumers assigned to **D: 'Consumers having no trust in and characterised by negative attitudes towards Hungarian products'** is reflected primarily by that they do not look for the place of origin of whatever they buy and they are the ones most likely to purchase imported products. The only significant correlation in this group was found in relation to a single statement according to which: 'special local products are growing more and more important as a counter-reaction to globalisation' but this correlation is a negative one. The negative attitude of the members of this segment probably originates from the fact that they are the ones most strongly missing reliable information concerning the reliable identification of Hungarian products.

The criteria of being 'of Hungarian origin'

Since there had been no clear definition of what qualifies as a 'Hungarian product' we tried to find out what our respondents meant by 'Hungarian product'. The interviewers listed seven criteria for 'Hungarian': the origin of the raw materials, the place of processing/manufacture, the nationality of the owner, the employees' nationality, the location of the company's registered office, the company's name and the place of the distribution of its products (Horváth et al. 2009). Most respondents (376) mentioned Hungarian raw materials and Hungarian production/manufacture as the ones to be met by a product to qualify as 'Hungarian', in line with the results of earlier surveys, as well as with the definition contained in the Code of Ethics on the Food Production Chain. The second most frequently (351) mentioned criterion was production in Hungary, followed by the employment of

Hungarian labour (297). These were then followed by Hungarian product name (295) and Hungarian manufacturer (284) and registered office in Hungary (268). Distribution of the manufacturer's products primarily in Hungary was mentioned by the smallest number of respondents (117). There were no significant differences between the customers of the two different stores in terms of their views of what makes a product Hungarian. Significant correlation between the clusters and criteria was found in one case. The criterion that the company should have its registered office in Hungary was found to be less important for 'Consumers with strong negative attitudes towards Hungarian products', than the sample mean, while the same criterion was more important for 'Consumers with positive attitudes towards Hungarian products for safety considerations'. Although there was no significant correlation the standardised residuals showed a negative correlation with cluster 'A' in relation to the criteria 'Manufacturer in Hungarian ownership' and 'They employ Hungarian labour'. All the above lead to the conclusion that the segment of negative attitude considers fewer criteria for a product to qualify as Hungarian, which must be linked to their disinterestedness.

Awareness of the sources of information for identifying Hungarian products, among the segments

The respondents were asked to list a few factors they rely on to identify Hungarian products. A total of 554 answers were received to this open question from the interviewees in the two stores. Table 5 illustrates the factors mentioned by respondents and the numbers of respondents mentioning them:

Table 5

The factors helping in the identification of the Hungarian products according to the customers' opinion

CBA + CORA	number of times mentioned
flag	78
logos	76
place of manufacture	65
indication (marking)	63
notices, posters put out in the stores	54
label information	49
known brand	48
manufacturer's name	29
Hungarian name	26
inscription	18
packaging	14
ingredients	13
bar code	12
advertisement	5
appearance	2
traditional product	2
total:	**554**

Source: own research (2008-2009) N = 387

To arrive at a more finely detailed picture we listed to the customers the sources of information we had collected and which we considered to be of relevance. The sources of information probed in this round included logos indicating Hungarian origin (the national and EU), product label information, well-known Hungarian manufacturer's brands, trading company's brand indicating Hungarian origin, bar code, the notice 'Hungarian' put out on boards in the store and the manufacturer's personal warranty (e.g. the seller in a market). The interviewers showed pictures of the logos concerned help respondents recognise them since these are presented on products in the form of visual information. (In the course of the interviews respondents were not asked about the criteria to be met by a product bearing the marking concerned).

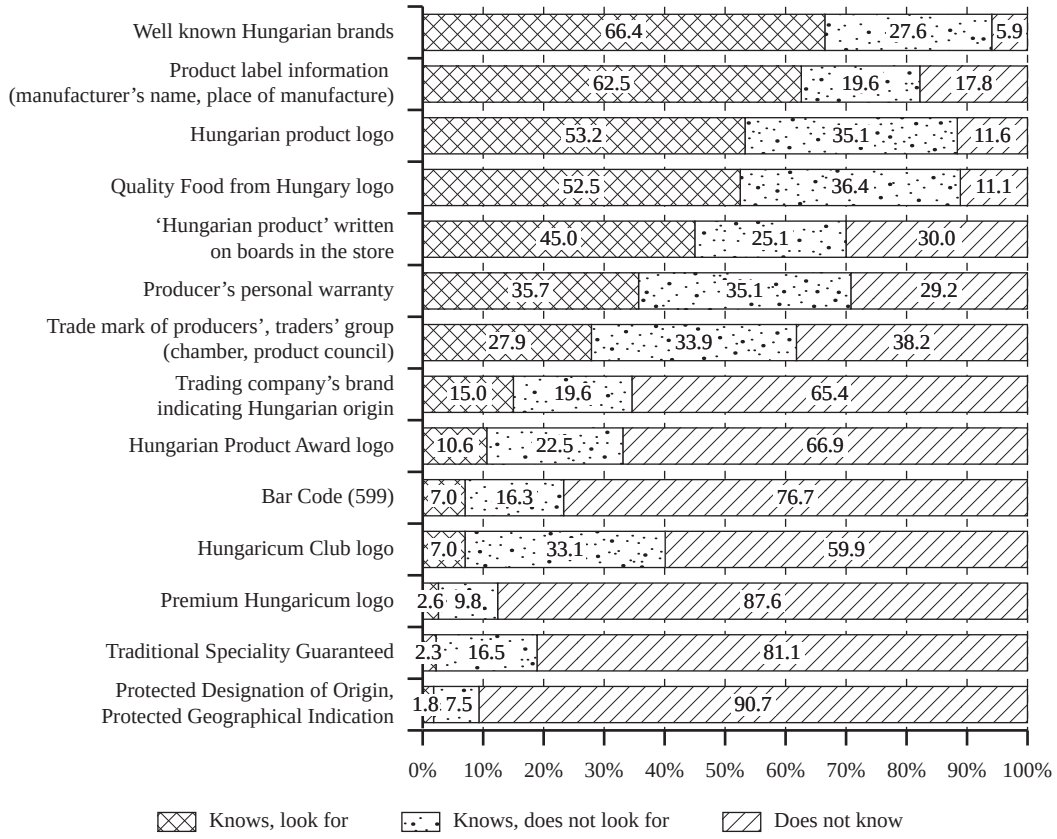

Figure 1: The information-sources used to identify Hungarian food products

Source: own research (2008-2009), N = 387

Most consumers purchase some well-known Hungarian manufacturers' brands when they want to purchase Hungarian food products (Figure 1). Accordingly, in the case of products qualifying as 'Hungaricums' adequate knowledge of the brands and the propensity to buy such products are both highest in this case. This is followed by information on the product label on which 62.5% of the respondents rely when they want to purchase Hungarian foodstuffs. From among the logos the Hungarian Product logo and the Excellent Hungarian Food Product logo are the most frequently sought after and known to the same extent. These are known to 89% of the respondents and 53% of them look for them when shopping for foodstuffs. A total of 61.8% of the respondents know the trade mark of one or another producer group but only 27.9% of them actually look for products bear-

ing such marks. Much less well known are the Hungarian Product Grand Prix logo, the Hungaricum Club logo and the Premium Hungaricum logo. The Traditional and Special trade marks and geographical indications are known to a negligible percentage of respondents though products bearing these logos are sometimes available in Hungary. A high proportion (46%) of the respondents rely on the notices indicating Hungarian origin on boards posted in the stores, which is not necessarily regarded to be a reliable source of information. A total of 35.7% of the respondents ask producers for information (e.g. in markets), while 34.6% of the customers know private labels indicating Hungarian origin and 15% of them actually look for them in shops. (There are products whose Hungarian origin is particularly highlighted among the private labels of both the Cora and the CBA stores chosen as the venue of our research).

The findings drawn from the answers given to the multiple-choice question matched those drawn from the answers received to the open question in that customers often rely on various logos in purchasing Hungarian products, they read label information (place of manufacture, name of manufacturer) and they often find their way around with the aid of the boards and posters displayed in the shops. One difference is however, that while in the case of the open question famous Hungarian brands were mentioned only in 48 cases, in the case of the questions assisted by mentioning examples this became the most important factor helping product identification. Thereafter we studied how the knowledge of and reliance on the above sources of information varies across the segments we had identified. Significant correlation between segments and the knowledge and use of information in seven cases: The Hungaricum Club logo (sig. = 0.02); Premium Hungaricum Club logo (sig. = 0.06); product label information (sig. = 0.00); Excellent Hungarian Food Product logo (sig. = 0.00), produce group's trade mark (sig. = 0,00); known Hungarian manufacturer's brands (sig. = 0.00); bar code (sig=0.04).

Amongst **'consumers with strong negative attitudes towards Hungarian products'** the standardised residuals showed differences in the case of six information sources. The awareness of the Excellent Hungarian Food Product is lower and it is sought after by a lower percentage of the respondents than had been expected. The awareness of the Hungarian Product logo is higher among these respondents and 44.6% of the segment actually looks for them when buying food products. However, 47% of these respondents do not look for the mark on products despite their awareness of it. A total of 45% of those in the segment read product label information when purchasing foodstuffs but even so this is a lot lower than the sample mean. A total of 10.8% of these respondents do not know Hungarian manufacturers' brands which, although not a very high proportion, is still almost twice a high as the total sample mean, and the proportion of those purchasing such products in this segment is also below average. A higher percentage than the sample mean do not know the bar code and this segment is least characterised by looking out for the 'Hungarian product' sign posted on boards in the stores. It was observed in the case of the segment that their awareness of and reliance on the most widely known types of information is below the sample mean.

The **'consumers with positive attitudes towards Hungarian products for safety considerations'** look for the most widely known sources of information when they want to purchase Hungarian products. Most of these respondents read label information (73.2%), known brands (84.1%), products featuring the Excellent Hungarian Food Product logo (64.6%) or they seek to buy food products bearing the logo of one or another producer group (36.6%).

The **'consumers with positive attitudes, biased towards Hungarian products'** are the most well informed concerning logos. A somewhat higher percentage among them than the sample mean know the Hungaricum Club and the Premium Hungaricum logos (50% and 19.7%) though members of this segment are not typically looking for them either. A total of 61.5% of the group

seek for the Excellent Hungarian Food Product logo and the highest percentage among the group's members read the label. This segment comprises the smallest number of people who do not know producer group trademarks and though 70.5% of them do not know much about the bar code, they still do not account for as high a percentage as the sample mean. On the whole, the preference of the people assigned to segment C – they are the most patriotic consumers – of Hungarian products appears in seeking for information in the course of shopping for foodstuffs and they appeared to know more than the members of any of the other segments about logos that are to be found on fewer products.

Fewer among those **'customers having no trust in and characterised by negative attitudes towards Hungarian products'** have any knowledge of the Hungaricum Club and the Premium Hungaricum logos than the sample mean, but those who do not look for these despite knowing about them account for a lower percentage of the group than the sample mean. The fact that the members of the group do not look for such trade marks is assumed to stem from their lack of knowledge of them. A total of 54% – the highest percentage among the segments identified here – of the members of this group do not know about producer group trademarks. More than half (53%) of the segment look for label information, but this is below the sample mean while there is a higher percentage of individuals among them who say they know but do not care about those details, probably because of the unreliability of such information. Interestingly, though this segment is less well informed in regard to the less frequently encountered national trademarks, the members of this group knew – somewhat – more about the EU's logos relating to the protection of geographical origin than those of the other groups.

4. Conclusions

Firstly, in studying the evaluation of the attributes of Hungarian food products we found that the average consumer considers that Hungarian products are of a medium or somewhat higher than medium quality. The average ratings however, resulted from the aggregation of a wide variety of opinions, therefore it seemed to be worth further analysing the views taken of product attributes.

Secondly, based on consumers' views of the product attitudes we distinguished four consumer groups – with the aid of cluster analysis – in terms of the factors affecting their choices between Hungarian and imported products when buying foodstuffs and in terms of their overall attitudes to Hungarian products. Some of the motives affecting their preference of Hungarian products are driven by emotive (affective) elements, others are guided by cognitive ones. Both emotive and cognitive motives may be either positive or negative. Such motives determine consumers' attitudes to domestic products, which in turn, affects their views and judgements of the various product attributes as well. The positive attitude for a product – however it is not sure forecaster for the purchasing – influences the buying decision positively.

Two of the four consumer segments established in the course of the analysis relate positively to Hungarian products. Our findings show that one of these two groups is made up of people of definite ethnocentric attitudes. Ethnocentrism encourages the development of customer' positive attitude to Hungarian products as a significantly positive emotive element. Supply side participants (farmers, processing companies) can have little influence on this behaviour, as it stems from a person's internal convictions. Any more significant change in this field may result from an increasing appreciation by Hungarian consumers of ethical values (including patriotism), if ethnocentric behaviour 'develops into a trend'.

Confidence in Hungarian products appears as a cognitive type of motive when the members of the other segment with positive attitudes make their decisions on what products to buy. Hungarian food producers and food processing companies should continue to rely on this confidence 'capital' since cognitive elements can be fortified by arguments, experience and proof. Laying emphasis on and highlighting reliable Hungarian quality may be particularly efficient in the communication of the advantages of domestic food products from the aspect of the contents of the messages to be conveyed.

Another sign of a growing demand for product attributes associated with confidence and trust is that in one of the two groups showing negative attitudes to Hungarian food products this negative relationship results from customers having no access to sufficient information, as a consequence of which they cannot determine whether a given product is Hungarian or not. The members of the other group – with the highly negative attitude – know even less about and rely even more scarcely on even the most widely known sources of information in comparison to the other segments, probably as a consequence of the fact that these people are, in general, disinterested and have an overall negative attitude.

Thirdly, although the fact that domestic raw materials are the single most important criterion for consumers in deciding whether a product is Hungarian or not has been proven by earlier surveys (Ipsos Kft., 2009) and by our survey as well, no sufficient importance is attached to this in the design of logos or in their communication.

Fourthly, our survey of consumers' awareness of sources of information indicating Hungarian origin showed that consumers tend to go for the best known brands when they want to be sure of choosing Hungarian products. This indicates adequate knowledge of our products qualifying as 'Hungaricums' and shows consumers' trust and confidence in them. A large proportion of respondents read the product label (country of origin, manufacturer's name etc.), scrutinise boards posted in the stores (which, however, do not necessarily provide them with sufficient and unambiguous information). The best known and sought after among the trademarks relating to source of origin include the Hungarian Product and the Excellent Hungarian Food Product logos. These were known to 89% of the respondents but only 53% of them are actually looking for them on the products.

Awareness of the other logos falls short of the above. A negligible percentage of our respondents knew about the markings used in the European Union for the protection of origin, not surprisingly, since consumers see few products bearing such logos on the shelves of shops in Hungary.

We assume that a consumer with an ethnocentric attitude will be more interested in checking label information and in knowing more about brands and trademarks. This was proven by our research, as the members of the segments of definitely ethnocentric attitudes knew most about the sources of information concerning the origins of products while those assigned to the segments of people having negative attitudes knew less in this aspect than the average.

As regards communication concerning identification and food safety it is crucial that consumers should be provided with adequate information concerning products and that they should get to know what the various trademarks mean. Expanding consumers' knowledge by adequate marketing communication in relation to origin and the quality indicator trademarks is a crucial task, along with emphasising the features that are really important for consumers, such as safety, Hungarian raw materials and manufacture in Hungary. These would boost confidence and trust in logos actually representing Hungarian origin of products. Acquiring trademarks could also help Hungarian farmers and producers who do not have sufficient resources for efficient brand building as do those producing the most renowned Hungaricums in emphasising the excellence of their products.

References

1. **Balabanis**, G. and **Diamantopoulos**, A. (2004): Domestic Country Bias, Country-of-Origin Effects, and Consumer Ethnocentrism: A multidimensional Unfolding Approach. Journal of the Academy of Marketing Science. 32 (1): 80-95.
2. **Bánáti**, D. and **Popp**, J. (2006): Élelmiszerbiztonság a nemzetközi kereskedelem tükrében (Food safety in the context of international trade). Agrárgazdasági Tanulmányok 2006/1
3. **Chasin**, J. B., **Holzmuller**, H. H. and **Jaffe**, E. D. (1993): Stereotyping, Buyer Familiarity and Ethnocentrism: A Cross Cultural Analysis. In Kaynak E. (ed.): The Global Business – Four Key Marketing Strategies. International Business Press, 73-86
4. **FVM** (2009): Élelmiszer Termékpálya Kódex, 2009 (Code of Ethics on the Food Production Chain). http://www.fvm.gov.hu/doc/upload/200904/elelmiszer_termekpalya_kodex_090409.pdf
5. **Gfk Hungária** (2009A): A vásárlók számára egyre fontosabb az áruk magyar eredete (Hungarian origin of products is growing increasingly important for consumers). http://www.gfk.com/imperia/md/content/gfk_hungaria/pdf/press_h/press_20090507_h.pdf
6. **Gfk Hungária** (2009B): Míg a magyarok inkább kevesebbet vásárolnak, addig az amerikaiak és az európaiak az olcsóbb termékeket keresik. (While Hungarians purchase less and less, Americans and Europeans seek for cheaper products). http://www.gfk.com/imperia/md/content/gfk_hungaria/pdf/press_extra_h/press_extra_20090903_h.pdf
7. **Horváth**, Á., **Füredinė Kovács**, A. and **Fodor**, M. (2005): Az értékrend hatása a táplálkozásra. (The impact of values on nutrition) Élelmiszer, Táplálkozás és Marketing. 2 (1-2): 69-76.
8. **Horváth**, L., **Kump**, E. and **Ottlik**, J. (2009): "Magyar termék" címkék ("Hungarian product" labels). http://tudatosvasarlo.hu/cikkek/678
9. **Ipsos Zrt.** (2009) A magyarság egyértelmű termékelőny, de nem záloga a sikernek (Being Hungarian is a definite product advantage but it does not guarantee success). http://www.szondaipsos.hu/site/a-magyars-g-egy-rtelm-term-kel-ny-de-nem-z-loga-a-sikernek/
10. **Javalgi**, G. R., **Khare**, P. V., **Gross**, C. A. and **Scherer**, F. R. (2005): An application of consumer ethnocentrism model to French consumers. International Business Review. 14: 325-344.
11. **Lakner**, Z., **Szabó**, E. and **Monspartné Sényi**, J. (2000): The country of origin effect in a transition economy- a case study of Hungary. Agrarwirtschaft. 49 (12): 411-418.
12. **Légrády**, E. (2009): Vonalkódok megfejtése (The explanation of bar codes). http://fogyasztok.hu/cikk/20090625/vonalkod_aru_azonositas_tudnivalok
13. **Lehota**, J. (2001): Élelmiszer-gazdasági marketing (Food sector marketing), Budapest: Műszaki Könyvkiadó.
14. **Malota**, E. (2003): Fogyasztói etnocentrizmus – A sztereotípiák, az etnocentrizmus és az országeredet imázs hatása a hazai és a külföldi termékek megítélésére. (Consumer ethnocentrism – Impacts of stereotypes and country origin image on the views taken of Hungarian and foreign products) PhD thesis, BCE, Budapest, 2006. Budapest: Budapesti Corvinus Egyetem.
15. **Malota**, E. (2004): Az országeredet imázs I. (The country origin image I.) Marketing and Menedzsment 4: 49-57.

16. **Pallóné Kisérdi**, I. (2007): Hagyományos és tájjellegű termékek európai szintű hasznosítási stratégiája (Utilization Strategy of Traditional and Regional Products on a European Level) In: „A hagyományos termékek piacrajutási lehetőségei" (Market Advancement of Traditional Products) Konferencia előadás, FVM, 2007. február 22.

17. **Petrás**, E. (2005): A lokalizáció és lokális identitás a globalizáció korában (Localisation and local identity in the age of globalisation), Szociológiai Szemle 4: 85-98

18. **Sajtos**, L. and **Mitev**, A. (2007): SPSS kutatási és adatelemzési kézikönyv (SPSS research and data analysis handbook) SPSS Budapest: Alinea Kiadó.

19. **Skuras**, D. and **Dimara**, E. (2004): Regional image and the consumption of regionally denominated products. Urban Studies, 41 (4): 801-815.

20. **Szabó**, E. (2006): Az eredet- és minőségjelzők alkalmazásának lehetőségei és feltételei a marketing-kommunikációban. (The opportunities and conditions of applying the origin labels in marketing communication) PhD thesis, BCE, Budapest, 2006. Budapest: Budapesti Corvinus Egyetem.

21. **Szakály**, Z. (2009): Az etnocentrikus fogyasztói magatartás Magyarországon. Az AMC legújabb piackutatásait bemutató konferencia (Ethnocentric consumer behaviour in Hungary – Conference on the latest market research projects of AMC), Budapest, 6 November 2009.

22. **Totth**, G. (2009): Közösségi marketingstratégia és az etnocentrikus fogyasztói magatartás, előadás (Collective marketing strategy and ethnocentric consumer behaviour – Presentation Conference on the latest market research projects of AMC), Budapest, 6 November 2009.

The correlation between the agricultural productivity and the export performance of the agro-food foreign trade in the Visegrád Group countries following accession to the European Union

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Abstract

In this paper we have sought to answer three research questions: what was the difference between the agricultural export growth rates of the Visegrád Group countries following the EU accession; how did the multifactor productivity in the countries under study evolve; and could a correlation be observed between the growth rates of the multifactor productivity and of the agricultural exports. The average annual growth rate of the multifactor productivity was highest in Poland, followed by the growth rate in Slovakia, in Hungary and in the Czech Republic. The average annual growth rates of the exports of agricultural raw materials and of the total food economy had identical rankings except for Hungary. The results of the analysis allow the presumption that the different annual average growth rates of the multifactor productivity of agriculture have also influenced the development of the agricultural export performance of the countries under study.

Keywords

agro-food foreign trade, agricultural productivity, Visegrád Group countries

1. Introduction

It is recognised that the Hungarian agro-food foreign trade has undergone remarkable changes following the accession to the European Union (EU): "With Hungary's accession to the EU, the system of conditions of the agro-food foreign trade has considerably altered. The changes concerned both directions of turnover, but their effects could be sensed far more strongly in the imports than in the exports." (KSH, 2007:2).

Several authors have analysed the changes which have occurred in the Hungarian agro-food foreign trade. By way of establishing a starting point for further analyses, we begin by providing a short overview of the main processes which occurred after the accession in the foreign trade of the Hungarian food economy products on the basis of the findings of previous studies. Thereafter, we have examined the development of the agro-food exports of the Visegrád Group countries. Following this, we have inspected the development of the multifactor productivity of agriculture, comparing thereafter the correlation between the growth rates of the multifactor productivity and of the agro-food exports.

Examination of the productivity is considered as important also due to the fact that productivity may be deemed as one factor (of major importance, in the opinion of some authors) of competitiveness. In connection with this, Botos (2009) commented that "certain components of competitiveness – especially in the macro-economic aspect – may not be quantified or quantified only in a quite unreliable manner". Furthermore, cites from Porter (1991) that "… only the productivity may be used as basis of comparison at the level of the national economy". Even so, relatively little information is available on the trends of the productivity of Hungarian agriculture and on their comparison with other countries in recent years. Here we should mention that intensive research

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activities were performed in the mid- 1980s into the competitiveness of agriculture at the Research Institute of Agricultural Economics (AKI) in Budapest (see for example Borszéki et al., 1986).

The three main calculation methods of the multifactor productivity are: the Stochastic Frontier Analysis (SFA), the Data Envelopment Analysis (DEA), and the index calculation method. Based on the character of the objectives and on the available database, we have selected the index calculation method for our analysis. Different index formulae may be used for the measurement of productivity with the index calculation method. Owing to their consistency with the productivity theories, the Fisher and Törnquist indices have come into general use. There is only a minimal difference between the values resulting from these two index formulae but as the Törnquist index is often preferred in empirical analyses (Coelli et al., 2005), we have used the Törnquist-Theil index for the calculation of the multifactor productivity index.

In summary, therefore, the research topics of our paper may be defined as follows:

1. What trends can be observed in the evolution of the agro-food export turnover of the Visegrád Group countries following the EU accession in 2004?
2. How has the multifactor productivity in the agriculture of the Visegrád Group countries developed following their EU accession in 2004?
3. What correlation may be detected or presumed between the growth rates of the agro-food export performance and of the multifactor productivity?

2. Trade literature overview

The development of the Hungarian food economy's foreign trade following the accession has been examined by several authors from several aspects. Here we present the most important findings of some studies.

Studies connected to the trade theories have assessed what products on what markets might be competitive. These studies include the works of Bojnec-Fertő (2006) and of Fertő (2004, 2006 and 2008), using the four different indices of the revealed comparative advantages elaborated by Balassa (1965). According to their findings, the structure of the comparative advantages revealed in agriculture is more stable than the price or quality competitiveness. They established that Hungary had comparative advantages against the EU-15 countries in respect of live animals, meat and meat preparations, oilseeds, timber and corkwood, but not in cereals.

Kiss (2005, 2007) studied the Hungarian food economy's foreign trade, with special regard to the trade with the old and new Member States. She concluded that the reasons for the trade balance deterioration which occurred during recent years were to be sought not in the insufficient export performance but rather in the more powerful import penetration. In her opinion, a change in the export structure (processed products with higher added value, animal products, fruit and vegetable sector) and its geographical diversification (developing and emerging countries) would be necessary.

Some of the research studies have assessed the competitiveness of the different food economy sectors, among others: Bozsik (2004) – wine products; Fogarasi (2003) and Jámbor (2008) – cereals; Medina (2005) – fruit and vegetables; Csillag (2005) – sugar; Módos (2004) and Tóth (2005) – meat product chain.

Several researchers in AKI are studying the foreign trade performance of the Hungarian food economy and the evolution of its competitiveness. Potori et al. (2004) assessed the viability and competitiveness of the main agricultural sectors, basing their analyses on the comparison of the alternative costs of the resources used for the production through application of DRC indices. Kartali et al. (2004a and 2004b) performed detailed analyses prior to EU accession of the competitive advantages and disadvantages of the main product chains (cereals, oilseeds, fruit and vegetables, wine, pork, poultry and milk) deriving from the demand and offer, marketing, logistics and distribution. They showed that the fruit and vegetable sector had the highest competitive advantages among plant products, while the oilseeds and cereals sectors were also judged as competitive. As regards animal products, the competitiveness indices among the product groups under study presented remarkable differences. Product groups of live animals, meat and meat preparations gained favourable competitiveness rankings but the milk and dairy products did not. Kürthy et al. (2007) sought to answer the question: what were the reasons for the dynamic growth of the food economy's imports following the accession. The dynamic growth was attributed to the following factors: methodological difficulties (the problematic of the country of consignment and country of origin), production transfer of the multinational companies, high cost-intensity of the domestic production (higher tax burdens), assortment widening (the quantity of imported live animals, meat and meat preparations, dairy products as well as of beverages and tobacco products increased in a spectacular manner), poor infrastructure, and low level of community marketing. A focused investigation of the imports from the Visegrad states shows an increase from 12% to 24% over the period 2000-2006, with the highest increase in Poland.

Kartali (ed.) (2008) and co-authors, on the other hand, examined the issue of the growth of the Hungarian food economy's exports. They assessed the top 30 target markets between 2000 and 2006. Their main conclusions included: the top ten target markets – including Austria, Italy, Russia, Romania, the Netherlands and Poland – absorbed 63%, and the top 30 target markets 94%, of Hungary's agro-food exports. The average market expansion growth rates presented remarkable differences; the largest markets were the most stable ones; the range of operation of the Hungarian food economy's exports was relatively small, with a radius of 2,500 km, in practice covering only Europe (simultaneously implying competitive advantages and disadvantages); the "driving markets" of the Far East were distant from Hungary; the poor transport infrastructure constituted the main difficulty within the logistics of the sector.

At the request of the Hungarian Chamber of Agriculture, collaborators at AKI prepared a wide-scope study entitled "Opportunities for improving competitive chances in the Hungarian food economy". Popp et al. (eds., 2008) stressed that no single factor could be mentioned as the reason for the weaker competitiveness of Hungary compared to other Central European countries. At the same time they pointed out: "… by today, our decline is slightly higher in almost all areas compared to the other countries, while we have no competitive advantages worthy of mention in any area, counterbalancing for example the attraction of the Slovakian tax system, the overall development level of the Czech infrastructure … or even the more dynamic enterprising culture and better management training in Poland".

The special value of the study consists in the fact that the competitive disadvantages of the Hungarian food economy are discovered in strict co-operation with the participants of everyday life (agricultural, food economy and commercial enterprises) and simultaneously proposals are made for their elimination. The practical utility of the findings is increased by the fact that, beyond *horizontal* diagnosis of the agricultural players, diagnosis of the participants of the *different product chains* is also provided. For the purposes of our study, a short overview of the horizontal competitive disadvantages may be summed up as follows.

The authors have ranked the competitive disadvantages in *three main* groups:

- **Economic environment:** Above all, participants of the economy have evaluated the taxation system as extremely bad, with special regard to its effects increasing the labour costs and thus encouraging illegal or "semi-legal" employment. In Hungary, the administrative burdens of the enterprises are extremely high and the economic and legal changes are often incalculable. Serious problems derive from the remarkable share of the black economy, inconsistencies of the monetary policies, and from the fact that "the agricultural development programme principally focused on production, while the targeted development of the agricultural production's value adding logistic systems (transport, freighting, storage and distribution) was not included among the priorities" (Popp et al., eds., 2008:45).
- **Agricultural policy:** The authors have expounded already that "Development of a coherent agricultural (food economy) policy concept, palpably improving the competitiveness of the domestic farmers and food industrial enterprises and spanning over governmental cycles, has remained unsuccessful during the recent period …" (Popp et al., ed., 2008:11). In the exposition of the topic they have stated that agricultural policy in Hungary in fact meant "support policy", having the principal aim of drawing as much as possible of the available EU resources; at the same time, this system often generated unnecessary investments. Among issues requiring solutions, the authors mentioned the problems deriving from the land purchase ban of the co-operatives and companies, the rationalisation of the different standards, and the abuses of dominant position by the food chains, as well as the urgent necessity of progress in the fields of information flow, innovation, special training and marketing activities.
- **Social problems:** beyond general lack of trust and business, in some cases also the lack of co-operation within the product chains, of skilled labour and property security, as well as the unilateral, production technology-oriented attitude of the Hungarian managers constitute the most important competition barriers.

Wagner et al. (2009, 2010) surveyed in an international comparison the effects of the explosion of food prices which occurred in recent years on the foreign trade of the Hungarian food economy. They calculated that the high agricultural trade surplus is due to the product divisions of cereals and oilseeds, while the share of the other product divisions (meat, vegetables, fruit and vegetable preparations) decreased and the division of milk and dairy products, for example, realised a negative balance.

3. Data sources and methodology

We have used data classified according to the SITC nomenclature for presenting the foreign trade processes. Analyses of the foreign trade processes have been made for the total agro-food trade as well as for the agricultural raw materials and for processed products. Items of product section "0", as well as product divisions 21, 22, 24, 27, 29, 41, 42 and 43 were included among agricultural raw materials, while the processed products included items of product section "1" and product divisions 56 and 63. The total agro-food exports are constituted of the sum of these two product groups. Data were drawn from the COMEXT database maintained by Eurostat (Eurostat 2010a).

For calculating the productivity indices, data of the Economic Accounts for Agriculture (EAA) have been used in all cases; the source of all data used was the internet database of Eurostat (Eurostat 2010b)

When calculating productivity, the outputs may be compared with one, several or all inputs. If comparing to one input, we get a partial productivity (PP) index; multifactor productivity (MFP) index is drawn from comparison to several inputs and total factor productivity (TFP) index from comparison with all inputs.

The productivity indices are categorised by the domestic agricultural economists in different ways (see, among others: Baráth et al.,2009; Mészáros, 1990, 1991; Szabó, P. 2003; Nábrádi, 2007; Nemessályi, Zs. and Nemessályi, Á. 2003; Pfau and Széles, 2001; Szűcs and Fekete Farkas, 2008).

For the calculation of the total factor (and multifactor) productivity three methods are commonly used: Stochastic Frontier Analysis (SFA), Data Envelopment Analysis (DEA), and the index number methods. For further details on productivity and efficiency calculations and their mathematical modelling see Coelli et al, 2005; Kumbhakar-Lovell, 2003; Fried et al., 2008; Mundlak, 2001 In: Gardner - Rausser eds., 2001.

Mészáros (1990, 1991) Hughes (2000) and Davidova et al. (2002) carried out investigations of the total factor productivity of Hungarian agriculture in the 1990s and at the Millennium, but little is known about its changes in recent years (Baráth et al., 2009). Several analyses of the technical efficiency – one of the elements of the TFP – have been published in recent years (see for example: Bakucs et al., 2010; Fogarasi, 2006, 2008; Latruffe-Fogarasi, 2009; Varga, 2006).

Due to lack of data concerning land rental rates, analysis of the total factor productivity was not possible in this paper (as in other studies, see: EC, 2002), therefore multifactor productivity index (MFP) was used for comparison. The multifactor productivity has been calculated on the basis of the Törnquist-Theil index. The Törnquist-Theil multifactor productivity index, in its general form, can be described by the following formula:

$$\ln MFP_{t_0,t} = \ln \frac{outputIndex_{t_0,t}}{inputIndex_{t_0,t}} = \frac{1}{2}\sum_{m=1}^{M}(r_{it_0} + r_{it})(\ln y_{mt} - \ln y_{mt_0}) - \frac{1}{2}\sum_{n=1}^{N}(s_{it_0} + s_{it})(\ln x_{mt} - \ln x_{mt_0}) \qquad (1)$$

where:

y: output quantity
x: input quantity
r: output shares
s: input shares
t_0: base time period
t: actual time period

The transitivity requirement is not satisfied by the Törnquist-Theil index in its original form, therefore it may only be used for bilateral comparisons. For complying with our aims, however, also comparison of the productivity indices' levels and their changes in time is necessary; thus we had to select an index allowing multilateral comparison (among countries and time periods). Based on the EKS[2] method, the Törnquist-Theil index may be transformed (Caves et al., 1982) for allowing multilateral comparisons:

$$\ln MFP^{T}_{t_0,t} = \left[\frac{1}{2}\sum_{m=1}^{M}(r_{mt} + \overline{r_m})(\ln y_{mt} - \overline{\ln y_m}) - \frac{1}{2}\sum(r_{mt_0} + \overline{r_m})(\ln y_{mt_0} - \overline{\ln y_m})\right] -$$

$$\left[\frac{1}{2}\sum_{n=1}^{N}(s_{nt} + \overline{s_n})(\ln X_{nt} - \overline{\ln X_n}) - \frac{1}{2}\sum_{n=1}^{N}(s_{nt_0} + \overline{s_n})(\ln X_{nt_0} - \overline{\ln X_n})\right] \qquad (2)$$

where:

[2] The EKS abbreviation derives from the initials of *Éltető, Köves* and *Szulc*, researchers that have investigated the index calculation problems emerging during international comparisons (*Éltető–Köves* [1964]; *Szulc* [1964]).

$\overline{\overline{r_m}}$: arithmetic mean of the output shares
$\overline{s_n}$: arithmetic mean of the input shares
$\overline{\ln X_n}$: arithmetic mean of inputs
$\overline{\ln y_m}$: arithmetic mean of outputs

Gross output of agricultural industry at constant producer prices in EUR constituted the category of outputs (Y) at the calculation of the multifactor productivity. Labour (x_1) in annual work units, the utilised agricultural area (x_2) in hectares and total intermediate consumption (x_3) at constant prices were used as inputs. When determining the input shares required for aggregation, in order to approach as much as possible the real conditions, we have also taken into account the costs of unpaid labour calculating with unit costs of the paid AWU. For determining the input shares of capital and intermediate consumption (IC), we have used the EAA's data in current prices concerning fixed capital consumption and intermediate consumption.

4. Results

The results are expounded below in the order of the objectives: firstly, the statements concerning the development of the food economy's foreign trade, then the results of the multifactor productivity calculations; and finally the correlation between the development of the multifactor productivity and of the export performance are examined.

4.1. Trends of the food economy exports in the Visegrád Group countries

During the assessment of the food economy's foreign trade, we have sought to answer the question: what differences existed among the growth rates of the Visegrád Group countries' food economy exports. We have examined the changes occurring in the agricultural exports separately for agricultural and processed products. Exports of both agricultural raw materials and of processed products have accelerated following the EU accession in each country (Figure 1); however the rates of growth were different in each country and in the different stages of the product chains. It is remarkable that exports of the processed products have increased more slowly than those of unprocessed products (agricultural raw materials) in each of the four countries. *The exports of the agricultural raw materials* have increased most in Poland and Slovakia (with a minimal difference); followed by the Czech Republic, while the rate of growth is much smaller in Hungary.

Growth rate of the exports of *processed products* was clearly the highest in Poland. The Czech Republic ranked second, while – as with the export growth of agricultural raw materials – Slovakia was third and, again far behind, Hungary was in fourth place. Consequently, the growth of the *total food economy exports* was highest in Poland and in Slovakia, followed by the Czech Republic, while Hungary presented by far the smallest growth rate.

Upon analysis of the foreign trade processes, it is evident that the growth rates of the agricultural exports presented remarkable differences in the four countries, simultaneously indicating differences in competitiveness of these countries. The changes of competitiveness are determined by several different factors; in the case of the food economy, the tendencies of the agriculture's productivity may be considered as one of the important explanatory variables. Therefore, for the purposes of our paper, the following questions emerge: what changes occurred within the same period in respect of the productivity of agriculture in the four countries, and whether any correlation can be detected between the productivity of agriculture and the export performance of the different sectors of the food economy. These issues will be dealt with later.

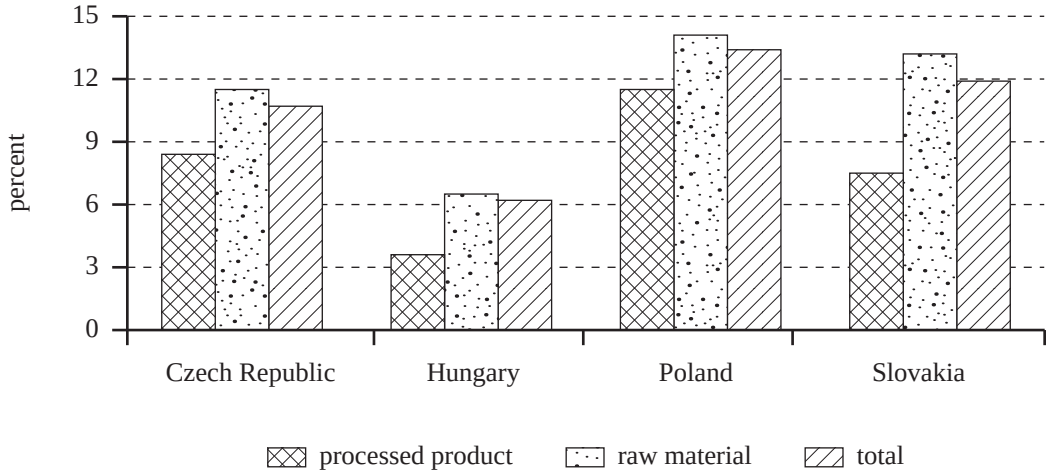

Figure 1: Average annual growth rates of the food economy's exports in the Visegrád Group countries (2001-2009)

Source: Own calculation based on Eurostat data

4.2. Evolution of the multifactor productivity index

The starting point for calculating a multifactor productivity index consists in defining the outputs and inputs as well as in establishing the shares of the single inputs. Table 1 shows the averages of the input shares in the countries under study.

Table 1

Average input shares used for the calculation of the multifactor productivity index (2001-2009)

Country	Capital	Labour	IC*
Czech Republic	0.11	0.26	0.64
Hungary	0.10	0.39	0.51
Poland	0.05	0.55	0.39
Slovakia	0.10	0.29	0.61

* Intermediate consumption (IC)

Source: Own calculation based on Eurostat data

Examining the shares of the single inputs, it can be established that there was no considerable difference as regards the share of capital in the input costs between Hungary, the Czech Republic and Slovakia. We consider it an interesting result that the share of capital is remarkably lower in Poland than in the other countries. At the same time, the share of the labour factor is by far the highest in the Polish agriculture, implying that the Polish agriculture is more labour-intensive than in the other countries. Hungary occupies the second place considering the share of the labour factor, allowing the presumption that labour has a more important role in the agricultural production in Hungary than in the Czech Republic and Slovakia. It is worthy of mention that share of paid AWU within the total AWU was higher in the countries with large average farm size: in the Czech Republic (135 ha) and Slovakia (120 ha) 74.4% and 58.1% respectively, while lower in Hungary (29 ha) 22.6% and

in Poland (12 ha) merely 6.0%![3] (Bergua et al., 2008; Martins, 2008, 2009a, 2009b). Upon inspecting the share of the FTF (purchases of goods and services), it is apparent that Poland constitutes an exception also in this respect; the share of the FTF within the costs is namely remarkably smaller than in the other three countries.

After having determined the input shares, the development of the multifactor productivity can be defined (Figure 2).

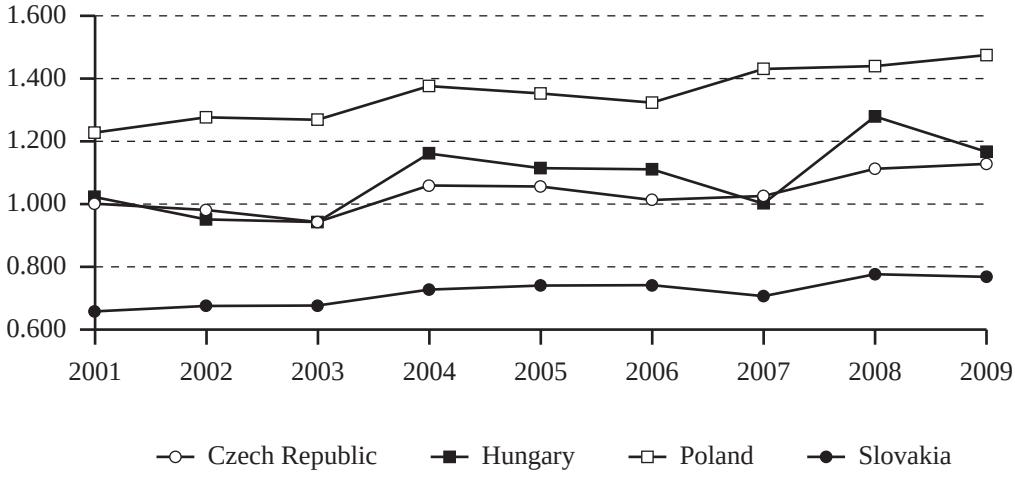

Figure 2: Development of the multifactor productivity of agriculture in the Visegrád Group countries (2001-2009)

Source: Own calculation based on Eurostat data

Thanks to the use of the multilaterally consistent index, the results can be compared among countries and also their changes in time can be followed. Based on the comparison among countries, it can be established that the multifactor productivity was unequivocally the highest in Poland and the lowest in Slovakia. The MFP level values of Hungarian and Czech agriculture were similar, even though in most years the Hungarian data exceeded the equivalent Czech values. Regarding the changes over time, the data show growth in each country. The growth rate was the highest in Poland, with an annual value of 2.3%; the same value, that is, the MFP growth rate, was 1.9% in Slovakia, 1.5% in the Czech Republic and 1.6% in Hungary. The growth is higher even in Slovakia and Poland, while larger fluctuations can be observed in Hungary and in the Czech Republic.

4.3. The correlation between the growth rates of the agro-food exports and of the multifactor productivity of the agricultural sector

With the help of Table 2 we have examined the correlation between the annual growth rate of the multifactor productivity of the agricultural sector and the growth rate of the exports of agricultural raw materials and of the processed products and of the total agricultural export. It is important to stress that several other factors not examined here may have a role in influencing the growth rate of the agro-food exports. In this paper we have tried to establish whether a correlation might be observed (or more precisely: presumed) between the growth rates of the multifactor productivity of agriculture and of the agro-food exports.

[3] In all countries under study, the data refer to farms exceeding 1 ESU.

Table 2

Annual average growth rates of the multifactor productivity of the agriculture and of the export performance in the Visegrád Group countries (2001 and 2009)

	MFP	Agricultural raw materials	Processed agricultural products	Total agro-food export
Czech Republic	1.50%	11.5%	8.4%	10.7%
Hungary	1.60%	6.5%	3.6%	6.2%
Poland	2.30%	14.1%	11.5%	13.4%
Slovakia	1.90%	13.2%	7.5%	11.9%

Source: Own calculation based on Eurostat data

Based on the data included in Table 2, the following statements can be made. The annual average growth rate of the multifactor productivity was the highest in Poland, followed by Slovakia. The same sequence is observed as regards the average annual growth rates of the agricultural raw materials and of the entire agricultural exports. The fact that while there was little difference between the annual average growth rates of the MFP of the Hungarian and Czech agriculture, the exports of the Czech food economy products (in both product chain stages) remarkably exceeded the Hungarian values is of note. Notwithstanding the Hungarian contradictory data, it may be presumed that the different annual growth rates of the productivity of agriculture influenced the agricultural export performance of the countries under study. Hungarian and Czech data, at the same time, call attention to the fact that several factors may contribute to the change of the growth rate of agricultural exports and also to the necessity to apply measures and economic incentives taking into account the most likely factors.

5. Summary

The Hungarian foreign trade balance in the period 2004-2006 declined by nearly 50% on average compared to the period 2001-2003, and has exceeded the base time period level by only 15% in the past three years.

Amongst the Visegrád countries Hungary was the least successful in adjusting itself to the newly emerging conditions of the EU accession in terms of agro-food exports. Its total trade balance with these countries was in almost all of the post accession years unfavourable.

Hungarian farmers proved to be unprepared for the conditions of the CAP both in terms of their technical-technological backgrounds and in their market competences. Animal husbandry organisations and, in particular, individual farms that were earlier kept going by state subsidies and protective tariffs that were high in Central European terms, were to suffer many sad experiences in the early years of accession.

An explanation for this can be that the dual type farm structure created by the compensation and privatisation practice in Hungary provided much less favourable conditions for the agricultural exports than the structures established in the Czech Republic and in Slovakia. Poland, on the other hand, with the primacy given to its individual farms, practically escaped from those difficulties that hit the rest of the Visegrád countries due to their history of large scale systems so heavily in their agricultural transition processes.

References

1. **Baráth**, L., **Hockmann**, H., **Keszthelyi**, Sz. and **Szabó**, G. (2009): A teljes tényezős termelékenység változásainak forrásai a magyar mezőgazdaságban (2001-2006). Sources of Total Factor Productivity Change in Hungarian Agriculture (2001-2006). Statisztikai Szemle, 87(5): 471-492.
2. **Bakucs**, L. Z., **Latruffe**, L. and **Fertő**, I. (2010): The impact of EU accession on farms' technical efficiency in Hungary. Post-Communist Economies. 22(2):165-175.
3. **Bergua**, M. **Mackova**, M. and **Marquer**, P.: Farm Structure in Poland-2007. Statistics in focus. 50/2008. http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-08-050/EN/KS-SF-08-050-EN.PDF
4. **Bojnec**, S. and **Fertő**, I. (2006): Comparative Advantages and Competitiveness of Hungarian and Slovenian Agro-Food Trade in the EU Markets. 98th EAAE Seminar 'Marketing Dynamics within the Global Trading System: New Perspectives. Chania, Crete. 29 June-2 July, 2006. http://ageconsearch.umn.edu/bitstream/10069/1/sp06bo7.pdf
5. **Borszéki**, É., **Mészáros**, S. and **Varga**, Gy. (1986): Élelmiszer-gazdaságunk versenyképessége. /Agrártermelésünk a világpiaci árak tükrében/. (The competitiveness of our food economy). /Our agricultural production in the light of the world market prices/. Budapest: Közgazdasági és Jogi Könyvkiadó
6. **Botos**, B. (2009): Versenyképesség és külkereskedelem. (Competitiveness and foreign trade). Európai Tükör 14(7-8):42-51.
7. **Caves**, D. W., **Christensen**, L. R. and **Diewert**, W. E. (1982): Multilateral comparisons of output, input, and productivity using superlative index numbers. The Economic Journal 92(365): 73-86.
8. **Coelli**, T. J., **Prasada Rao**, D. S., **O' Donnell**, C. J., and **Battese**, G. E. (2005): An Introduction to Eficiency and Productivity Analysis (Second edition). USA: Springer.
9. **Davidova**, S. , **Gorton**, M. , **Ratinger**, T., **Zawalinska**, K., **Iraizoz**, B., **Kovacs**, B. and **Mizo**, T. (2002): An Analysis of Competitiveness at the Farm Level in the CEECs. Joint Research Project. IDARA. Working Paper 2/11.
10. **EC** (2002): Income from agricultural activity in 2001. The European Union and Candidate Countries. European Commission: Luxembourg
11. **Erdész**, F.-né, **Fogarasi**, J., **Hingyi**, H., **Nyárs**, L., **Papp**, G., **Potori**, N. (szerk.), **Spitálszki**, M. and **Vőneki**, É. (2004): A főbb mezőgazdasági ágazatok élet- és versenyképességének követelményei. (Viability and Competitiveness Criteria of the Major Agricultural Sectors). Agrárgazdasági Tanulmányok. 2004/8 Budapest: Agrárgazdasági Kutató Intézet
12. **Eurostat** (2010a): Traditional external trade database access (ComExt). http://epp.eurostat.ec.europa.eu/newxtweb/setupdimselection.do
13. **Eurostat** (2010b): Economic Accounts for Agriculture. http://epp.eurostat.ec.europa.eu/portal/page/portal/agriculture/data/database
14. **Éltető**, Ö. and **Köves**, P. (1964): Egy nemzetközi összehasonlításoknál fellépő indexszámítási problémáról. (About an index calculation problem occurring with international comparisons). Statisztikai Szemle. 42(5):508-518.

15. **Fertő**, I. (2004): Agri-food trade between Hungary and the EU. Budapest: Századvég Kiadó

16. **Fertő**, I. (2006): Az agrárkereskedelem átalakulása Magyarországon és a kelet-közép-európai országokban. (The transformation of the agricultural trade in Hungary and Eastern-Central Europe). Budapest: MTA Közgazdaságtudományi Intézet.

17. **Fertő**, I. (2008): A magyar agrárexport kereskedelmi előnyei és versenyképessége az EU piacain. (The trade advantages and competitiveness of Hungarian agricultural export in the EU markets). MTA KTI Műhelytanulmányok 2008/17

18. **Fogarasi**, J. (2006): Efficiency and total factor productivity in post-EU accession Hungarian sugar beet production. Studies in Agricultural Economics. 105:87-100.

19. **Fogarasi**, J. (2008): Farm size and determinants of productive efficiency in Hungarian crop production. HAWEPA 2nd Halle Workshop of efficiency and productivity analysis. May 26-27, 2008. CD-Rom.

20. **Fried**, H. O., **Knox Lovell**, C. A. and **Schmidt Shelton**, S. (2008): Efficiency and Productivity. Oxford: Oxford University Press

21. **Hughes**, G. (2000): Agricultural Decollectivisation in Central Europe and the Productivity of Emergent Farm Structures. PhD thesis. London: Wye College. University of London.

22. **Kartali**, J. (szerk.) (2008): A magyar élelmiszergazdasági export célpiaci és logisztikai helyzete. (Hungarian agri-food export – Target markets and logistic situation). Agrárgazdasági Tanulmányok 2008/1 Budapest: Agrárgazdasági Kutató Intézet

23. **Kartali**, J., **Juhász**, A., **Kőnig**, G., **Kürti**, A., **Orbánné Nagy**, M., **Stauder**, M. and **Wagner**, H. (2004a): A főbb agrártermékek piacra jutásának feltételei az EU-csatlakozás küszöbén. I. kötet. Növényi termékek. (The conditions of agricultural product marketing at the doorstep of the EU accession. Volume I. Plant products). Agrárgazdasági Tanulmányok 2004/1. Budapest: Agrárgazdasági Kutató Intézet

24. **Kartali**, J., **Juhász**, A., **Kőnig**, G., **Kürti**, A., **Orbánné Nagy**, M., **Stauder**, M. and **Wagner**, H (2004b): A főbb agrártermékek piacra jutásának feltételei az EU-csatlakozás küszöbén. II. kötet. Állati termékek. (The conditions of agricultural product marketing at the doorstep of the EU accession. Volume II. Animal products). Agrárgazdasági Tanulmányok 2004/2 Budapest: Agrárgazdasági Kutató Intézet

25. **Kiss**, J. (2005): A magyar élelmiszer-gazdaság világgazdasági mozgástere. (The scope of Hungarian food economy in the world economy). MTA VKI Kihívások No. 184. http://www.vki.hu/kh/kh-184.pdf

26. **Kiss**, J. (2007): Szertefoszló agrárremények, avagy EU-csatlakozásunk agrár-külkereskedelmi hatása. (Glimmering agricultural expectations: the effect of our EU membership on the external trade of agricultural products). MTA VKI Kihívások No. 188 http://www.vki.hu/kh/kh-188.pdf

27. **KSH** (2007): Az agrárjellegű termékek külkereskedelmi forgalma. (The foreign trade turnover of agriculture-like products). Statisztikai Tükör 1(13):1-3.

28. **Kumbhakar**, S. C. and Knox Lovell, C. A (2003): Stochastic Frontier Analysis. Cambridge: Cambridge University Press

29. **Kürti**, A., **Stauder**, M., **Wagner**, H. and **Kürthy**, Gy. (2007): A magyar élelmiszergazdasági import dinamikus növekedésének okai. (The reasons of the dynamic increase of import in the Hungarian food economy). Agrárgazdasági tanulmányok 2007/4, Budapest: Agrárgazdasági Kutató Intézet

30. **Latruffe**, L. and **Fogarasi**, J. (2009): Farm performance and support in Central and Western Europe: A comparison of Hungary and France. Working Paper Smart-Lereco. 09-07.

31. **Martins**, C. (2008): Farm Structure in Czech Republic-2007. Statistics in focus. 86/2008 http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-08-086/EN/KS-SF-08-086-EN.PDF

32. **Martins**, C. (2009a): Farm Structure in Hungary-2007. Statistics in focus. 7/2009 http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-007/EN/KS-SF-09-007-EN.PDF

33. **Martins**, C. (2009b): Farm Structure in Slovakia-2007. Statistics in focus. 37/2009 http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-037/EN/KS-SF-09-037-EN.PDF

34. **Mészáros**, S. (1990): A gazdasági hatékonyság értelmezése, mérése, nemzetközi összehasonlítása és növelésének tényezői a magyar élelmiszer-termelés főbb vertikumaiban (The interpretation, measuring and international comparison of economic efficiency, the factors of its growth in the major sectors of the Hungarian food production). (OTKA Tanulmány). Budapest: Agrárgazdasági Kutató Intézet.

35. **Mészáros**, S. (1991): A hatékonyság alakulása az EK és Magyarország mezőgazdaságában. (The trends of agricultural efficiency in the EC and in Hungary). Gazdálkodás. 35(9):1-13.

36. **Mundlak**, Y. (2001): Production and Supply. In: Gardner, B. L. and Rausser, G. C. (eds.) (2001): Handbook of Agricultural Economics. Volume 1A. Amsterdam: Elsevier Science B. V. 3-86.

37. **Nábrádi**, A. (2007): Az eredményesség családfája. (The family tree of efficiency). Gazdálkodás. 51(4):99-114.

38. **Nemessályi**, Zs. and **Nemessályi**, Á. (2003): A gazdálkodás hatékonyságának mutatórendszere. (Indicators of economic efficiency). Gazdálkodás, 47(3):54-60.

39. **Pfau**, E. and **Széles**, Gy. (eds.,2001): Mezőgazdasági üzemtan II. (Agricultural farm management II) Budapest: Mezőgazdasági Szaktudás Kiadó.

40. **Popp**, J., **Potori**, N., **Udovecz**, G. and **Csikai**, M. (eds., 2008): A versenyesélyek lehetőségei a magyar élelmiszer-gazdaságban. (Competitive prospects in the Hungarian food economy). Budapest: Szaktudás Kiadó Ház Zrt.

41. **Porter**, M. E. (1991): The Competitive Advantage of Nations. London: Macmillan Press Ltd.

42. **Szabó**, P. (2003): Módszertan – Statisztikai gyakorlat. Mezőgazdasági termelékenységi mutatók. (Methodology–Statistical practice. Agricultural productivity indexes). Gazdaság és Statisztika. 54(4):56-63.

43. **Szulc**, B. J. (1964): Indices for Multi-regional comparisons. Prezeglad Statystyczny (Statistical Review). 3(3):239-254.

44. **Szűcs**, I. and **Fekete Farkas**, M. (eds, 2008): Efficiency in Agriculture (Theory and practice). Budapest: Agroinform Publisher

45. **Varga**, T. (2006): Potential for efficiency improvement of Hungarian agriculture. Studies in Agricultural Economics 104:85-109.

46. **Wagner**, H. (ed.) (2009): A válság hatása a magyar élelmiszer-gazdasági külkereskedelemre nemzetközi összehasonlításban. (The Impacts of the Crisis on the Foreign Trade of the Hungarian Food Economy in an International Context). Agrárgazdasági Tanulmányok 2009/8 Budapest: Agrárgazdasági Kutató Intézet

47. **Wagner**, H. (2010): A válság hatása a magyar élelmiszer-gazdasági külkereskedelemre nemzetközi összehasonlításban. (The Impacts of the Crisis on the Foreign Trade of the Hungarian Food Economy in an International Context). Gazdálkodás. 54(1):26-36.

Some factors responsible for reductions in employment on farms in Hungary

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Abstract

A decline in the number of people working on farms and in the Annual Work Units per unit area was typical of the second half of the first decade of the 21st century in the member states of the European Union. Hungary is one of the countries where this reduction is twice as high as the average. This can be attributed to a number of factors. Of these, the present paper is concerned on the one hand with farm concentration, the low level of farm diversification and pluriactivity and the desire of farmers to expand their farms, and on the other hand with various aspects of the support policy in Hungary aimed at the economic competitiveness and the diversification of the rural economy. The database on which the work was based was taken partly from the digital and printed publications of EUROSTAT and the Hungarian Central Statistical Office (KSH) and partly from surveys of 104 farmers in three microregions of Hungary. Even before the global economic crisis, the factors in question tended to result in a decline in farm employment in Hungary, especially on individual farms. The means and measures embodied in the agricultural and rural policies proved too few and too weak to counterbalance this trend.

Keywords

on-farm employment, farm diversification, farm concentration, support policy

1. Introduction

During the first three years of this century, the number of Annual Work Units (AWU) per 100 hectares of agricultural land stagnated in the EU-15 countries, while there was a decline of less than half a percent in the number of employed. Between 2003 and 2007, however, these indexes started to decline even in this group of countries, with reductions of 9.4 and 10.4%, respectively. After the new accessions to the Union, the decrease in these indexes in the EU-27 countries amounted to 12.3 and 12.4%, while the figures for the EU-8+2 group of ex-Socialist countries were 16.3 and 14.4% (see database and methods).

The AWU index per 100 ha agricultural land dropped in all 27 countries of the European Union between 2003 and 2007, but there were great fluctuations (1.9-41%). Below-average values were reported for Austria, Belgium, Denmark, the Netherlands, Ireland, Poland, Luxemburg, UK, Malta, Spain and Sweden, average values for France, Greece, Germany, Italy and Slovakia and values that were above average, but less than twice the average for the Czech Republic, Cyprus, Romania and Slovenia. The decrease was more than twice the average for Bulgaria, Estonia, Finland, Latvia, Lithuania, Hungary and Portugal (Eurostat, 2010).

According to data from the Hungarian Central Statistical Office, the AWU index per 100 ha agricultural land decreased by 34% in Hungary between 1998 and 2008, with a reduction in farm employment corresponding to the loss of 307,000 full-time workers. Within this 10-year period the

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figures for the period before EU accession (1998-2003) were 13%, or 162,000 full-time workers, while a further 24%, or 145,000 full-time workers were lost after EU accession (KSH, 2009).

The decline in farm employment and in the Annual Work Units per unit area can be regarded as a characteristic process in member states of the EU in the second half of the first decade of the 21st century. As stated above, Hungary belonged to the group of countries where this reduction was more than twice the EU average, despite the fact that between 2000 and 2008, three Hungarian governments gave priority to an increase in rural employment.

According to the ex-ante evaluation of the New Hungary Rural Development Programme (NHRDP), the average farm size will increase by 68%, the number of farms will decline by 30% and the number of people employed on farms will drop by the equivalent of 140,000 AWU between 2005 and 2013. (The plans also foresee a decrease in those working in the food industry.) An expansion of 38,000 workers is planned for the secondary and tertiary sectors of the rural economy, which will clearly not be sufficient to absorb those laid off by farms or to improve rural employment (New Hungary, 2007).

So why is on-farm employment decreasing at such a high rate in Hungary? Among the numerous reasons, various authors have examined the radical changes in the ratio of different sectors (with the reduced significance of vegetable and fruit growing and of animal husbandry), the simplification of production structures, the decline in labour-intensive sectors, and reductions in domestic food processing and demand (Hamza et al., 2002; Fehér, 2005; Tóth et al., 2006). According to Szabó (2008:77) „during the past 15 years Hungarian agricultural literature has given prevalence to the issue of competitiveness , allowing it to overshadow agriculture's role in sustaining and retaining the rural population... Agriculture still has an important employment role. ...After EU accession, horticulture and major animal husbandry sectors were pushed into the background, and employment opportunities in agriculture plummeted". The present paper will concentrate on a number of background factors, which have been given less attention, but which exert a considerable effect on farm employment figures. It is hoped that this will help to answer the question and suggest measures that could reverse the process.

2. Database and methods

The database used in the current work was taken partly from the digital and printed publications of EUROSTAT and the Hungarian Central Statistical Office (KSH). Among the databases to be found under the title "agriculture" on the EUROSTAT website (http://epp.eurostat.ec.europa.eu/portal/page/statistics) use was made of several tables from the Farm Structure Survey (AGRI-YEARBOOK-FSS, FSS_2007, K_AWU, OGA_WT, WD_OGA_L07). The designation EU8+2 refers to the eight ex-Socialist countries that acceded to the EU in 2004, plus Bulgaria and Romania, which acceded later. Digital data on the agricultural sector in Hungary were downloaded from the website of the Central Statistical Office at http://portal.ksh.hu/portal/page?_pageid=37,592051&_dad=portal&_schema=PORTAL). In the paper individual farms and agricultural companies will be referred to as farms or holdings. Data from a survey on 104 farmers from three Hungarian microregions (Karcag, Tarna-menti and Tisza-Tarna-Rima-menti) were also used as a database. The methodological aspects of this survey were discussed in a previous paper (Fehér et al., 2010a). The data will now be considered from a different point of view. As only 5% of the respondents represented agricultural companies, the results mainly reflect the nature of individual farms.

Simple statistical methods (grouping, comparison, concentration analysis) were used to process the data, and most of the results are also presented in the form of graphs.

3. Farm concentration and on-farm employment

There was a 16.4% decrease in the number of farms in the EU-15 countries between 2000 and 2007, while the average hectarage of each farm (or holding) increased by 17.5% and the size in terms of European Size Units (ESU) by 27.5%. This process continued after the expansion of the European Union: between 2003 and 2007 the reduction in the number of farms was 9.2%, with a 9.4% rise in the average farm area or 14.2% in terms of ESU (Eurostat, 2010). It can be seen from Figures 1 and 2 that there were considerable differences in farm area and income concentration between individual countries and country groups.

Not only did the relationship between the individual indexes differ from one country to the other, but *in most cases countries with higher average farm size had a lower value of work units per 100 hectares of agricultural area.* To examine this phenomenon the countries were divided into four groups. The first group included countries where the average farm size in 2003 was less than 50% of the EU-27 mean (Bulgaria, Cyprus, Greece, Hungary, Malta, Romania). In the second group the average farm size was up to 50% smaller or larger than the EU-27 mean (Poland, Latvia, Lithuania, Italy, Portugal, Slovenia). The countries in the third group had an average farm size 1.5-2.5 times the EU-27 mean (Austria, Belgium, Estonia, the Netherlands, Spain), while the remaining ten countries, with an even higher average land area per holding, were placed in the fourth group. The EU-8+2 countries were not equally represented in the four groups (*30-40-10-20%*). The main parameters are listed in Table 1.

Table 1

Indicators for farm concentration and labour force in the groups of EU-27 countries in 2003 and 2007

Denomination		AWU/UAA 100ha		ESU/holding		ESU/AWU		UAA /holding	
		2003	2007	2003	2007	2003	2007	2003	2007
Group1	< 5.75 ha	18.43	14.64	1.98	2.25	2.89	3.63	3.72	4.24
Group2	5.76-17.25 ha	12.82	11.67	6.10	7.74	6.62	8.62	7.19	7.69
Group3	17.26-28.75 ha	4.50	4.32	20.93	26.82	21.25	26.12	21.87	23.78
Group4	> 28.76 ha	3.33	2.97	41.73	41.76	27.79	29.08	45.11	48.30
Mean EU-27		**7.73**	**6.78**	**9.78**	**11.27**	**11.10**	**13.20**	**11.50**	**12.59**

Source: Own calculation and composition from Eurostat data

Table 1 and Figures 1 and 2 not only confirm the process of farm concentration and its effect on employment figures, but also indicate the following:

- An increase in average farm size is characteristic of all four groups, with the highest absolute increase in Groups 3 and 4.
- The decrease in the number of annual work units per 100 hectares agricultural area (both in absolute and relative terms) was the most rapid in the first group, which includes Hungary, between 2003 and 2007. (The percentage increase in the land area per farm was also the greatest in this group.)
- The value of European Size Units per farm, calculated on the basis of the Standard Gross Margin, rose most rapidly in groups 2 and 3. At the same time, the difference between the average farm sizes in groups 1 and 4 in terms of ESU dropped from 21 times to 18 times.

- Although the difference in the standard gross margin per annual work unit decreased slightly between Group 1 and the other groups, this was associated with a reduction in those employed in agriculture in the countries in Group 1, amounting to the equivalent of 969,000 full-time jobs (20.8%), between 2003 and 2007.
- Further comparisons between the individual countries and country groups would require more complex analysis, involving a survey of production structure, labour productivity, level of mechanisation, ratio of agricultural companies to individual farms, trends in paid and unpaid labour, and numerous other factors, which exceed the framework of the present work.

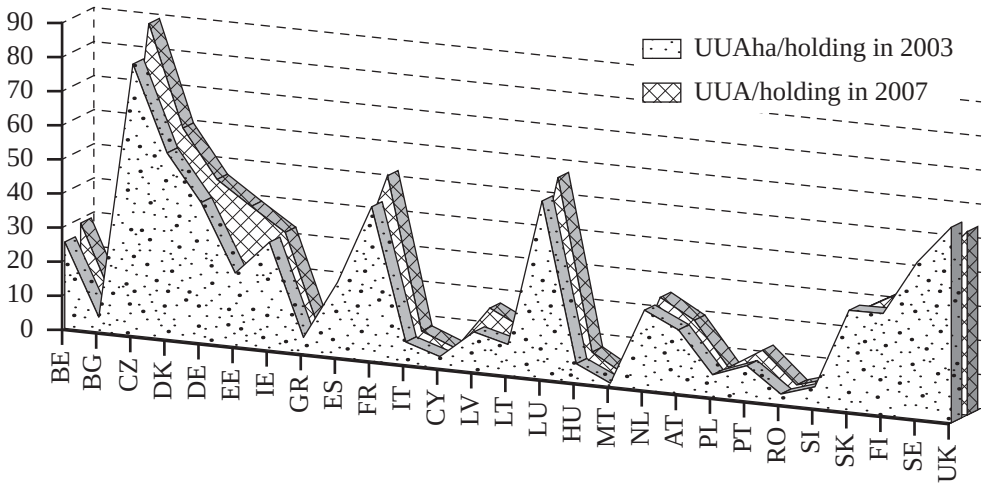

Figure 1: Concentration of Utilized Agricultural Area in EU-27 countries in 2003-2007

Source: Own calculation and composition from Eurostat - Farm Structure Survey

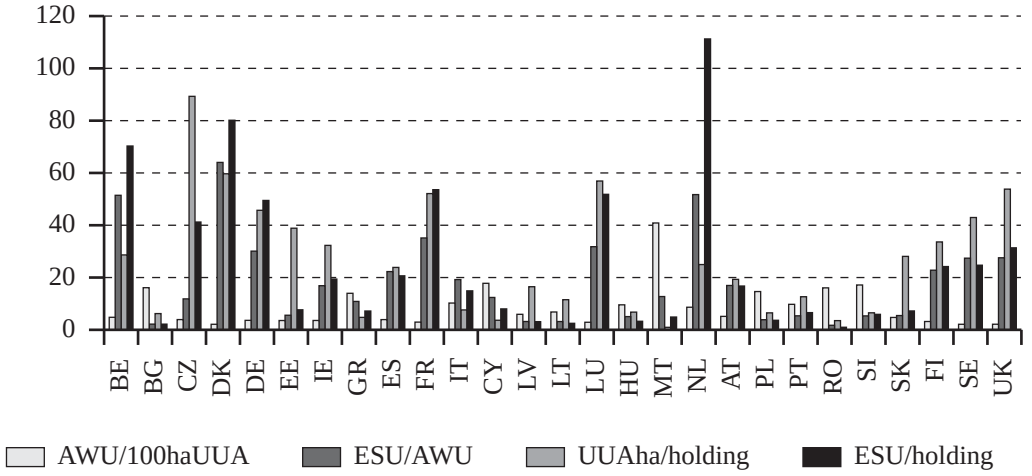

Figure 2: Indicators for farm concentration and labour force in EU-27 countries in 2007

Source: Own calculation and composition from Eurostat - Farm Structure Survey

Based on data from Eurostat for 2010, the number of farms in Hungary declined by 35% between 2000 and 2007, while the land area per farm increased by 43%. The 20% rise in the average area of Hungarian farms from 2003–2007 and the 42% rise in ESU per farm considerably exceeded the growth rates for the EU-8+2 and the EU-15 countries. In connection with the data depicted in Figure 2, it should be noted that the size of Hungarian farms was 75% smaller than the mean for the EU countries in terms of ESU and 46% smaller in terms of hectares, while the labour force employed per 100 hectares was 41% higher (Eurostat, 2010). A number of parameters indicative of land area concentration, suitable as a basis for comparison, are presented in Table 2.

Table 2

Indicators of land use concentration in 2000 and 2007

Denomination		EU-15				Hungary				EU-27	
		2000		2007		2000		2007		2007	
		No	UAA	No	UAA	No	UAA	No	UAA	No	UAA
Distribution of arable land utilised by farms, %	0-5 ha	57.7	5.2	54.5	4.4	90.7	12.0	89.5	6.8	70.4	8.4
	5-10 ha	12.3	4.6	12.9	4.1	4.1	5.9	3.9	3.9	11.4	6.3
	10-20 ha	10.2	7.7	10.5	6.8	2.7	7.9	2.7	5.5	7.2	8.1
	20-50 ha	10.9	18.6	11.2	16.4	1.6	10.6	2.0	9.0	5.9	14.7
	50- ha	8.9	63.9	10.9	68.3	0.9	63.6	1.9	74.8	5.1	62.5
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Own calculation and composition from Eurostat data

The figures in grey cells indicate the class range (category) into which the average area for the various groups fell in 2007. The strong bipolarity of the Hungarian figures is clear from the table. The farm structure is illustrated in Figure 3.

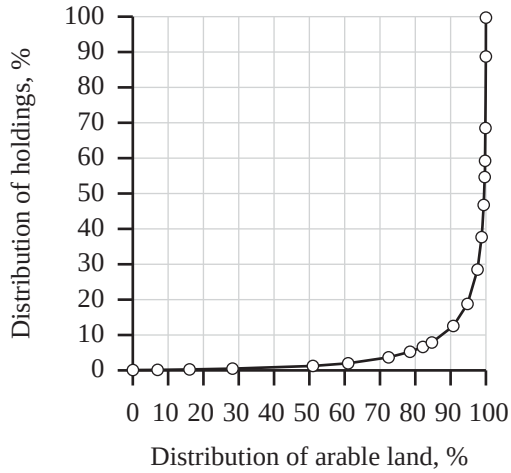

Figure 3: Lorenz curve of Hungarian farm concentration in 2007

Source of data: Own calculation and composition from data of KSH (Hungarian Central Statistical Office)

According to HCSO (KSH) data, the farm area concentration between 2005 and 2007 involved a reduction in the arable land utilised by farms of less than 50 hectares and an increase in that utilised by larger farms. This process was more intensive for individual farms. Earlier research

(Fehér, 2005) suggests that this could be attributed partly to the fact that *the work force per unit area was smaller on larger farms, which means that they could not employ those from whom the land was rented or purchased.* A survey carried out on individual farms exhibited a similar relationship between farm size and the labour force requirements (Burgerné et al., 2006). Attention should, however, be paid to the following:

- In the EU-8+2 countries, including Hungary, a high proportion of the work force is made up of family members (88.1% in 2007), while in the EU-15 countries this averaged only 71.7% (Eurostat, 2010).
- In Hungary a high proportion of the work carried out by family members was classified as unpaid labour. This was particularly true of family members associated with individual farms, and made up 75.8% of AWU in Hungarian agriculture in 2007. The rate of decline in this type of labour is quite different from that for paid work. Between 1988 and 2003 it dropped by 21.2% in terms of AWU, with a further 24% decrease from 2003-2007. During the same periods, the equivalent figures for paid labour decreased by 24.3% and 10.2%, respectively (KSH, 2009). This also included family members who had become too old to work. *After EU accession a large number of family members of active working age were also forced onto the labour market in Hungarian agriculture, making it very difficult for many rural families to make a living.* In reality, the number expressed in equivalent values (AWU*)* represents a far larger number of people.
- From the point of view of employment, individual farms and agricultural companies behave differently. The former employ mostly family members and occasional or seasonal workers, while the latter also have a larger regular work force. In 2007, 59% of the regular, seasonal and occasional work force in agriculture was employed on individual farms, and the remainder in companies (GSZÖ, 2007).

4. Farm diversification, multifunctionality, non-agricultural (other gainful) activities

The terms farm diversification, pluriactivity and multifunctionality are often used together in the literature (Brouwer et al., 2008). The synthesis of these terms at farm level and a classification of their similarities and differences were carried out, based on the literature, in earlier papers (Fehér, 2003; 2005). The Eurostat data often include the category "other gainful activities" (OGA), in which farm diversification and pluriactivity become almost indistinguishable. So when this source is utilised, it is impossible to differentiate between the two expressions in the present work.

In the 27 member states of the European Union as a whole, both farm diversification and pluriactivity increased substantially between 2003 and 2007. In 2003 some form of non-agricultural activity was carried out in only 6.2% of farms, and the diversification index[3] was only 0.89%. This

[3] Comparative analysis between spatial units can be performed using the *aggregated agricultural or non-agricultural diversification index* (Fehér, 2003). The latter is calculated as follows: The number of farms involved in each non-agricultural activity in each farm group or spatial unit as a whole is summed, and the value obtained is divided by the total number of farms in the given group. This can be expressed as: $\frac{\sum_{i=1}^{n} A_i}{\sum F}$

where A = the given non-agricultural activity; 1...n = the frequency of the activity within the group; F = the number of farms in the group. This index is particularly suitable for taking into consideration the various types of non-agricultural activities carried out in any given farm, which is not expressed by indexes expressing the percentage occurrence of diversification. With the necessary modification, this index can also be used for the measurement of *agricultural diversification* (ratio of alternative crop production and animal husbandry).

suggested that the ratio of non-agricultural activities was low even on more diversified farms. In 2007 the ratio of farms carrying out non-agricultural activities had risen to 9.94%, while the diversification index was 1.4%. In the case of the new EU member states from Eastern and Central Europe (EU-8+2) the increase in the incidence of non-agricultural activities was 0.1 percentage points higher and that in the diversification coefficient 0.2 percentage points higher than the average. As regards average values, the difference between the two groups of countries in terms of diversification and pluriactivity had narrowed, but there were substantial differences between the countries within both groups (Figures 4 and 5). In the EU-15 group, the agriculture of Austria, Denmark, France, Finland, the UK, Germany and Sweden is relatively diversified, while in the EU-8+2 group the Czech Republic and Romania should be mentioned, though these have much lower values.

It is clear from Figure 4 that – with the exception of Finland – in EU-15 countries with a high ratio of "other gainful activities", the rate of reduction in the agricultural labour force was much lower than average. According to Eurostat (2010), the average hectarage and size in ESU of such farms was more than twice the average values both for the EU-15 countries and for the whole of the EU. It was seen above that larger farms had a smaller labour force per unit agricultural area. The statement by the EU Directorate-General for Agriculture and Rural Development that "an analysis conducted in France also showed that diversified farms occupy more people than non-diversified ones..., thus contributing to employment" (EU Directorate-General, 2008) is particularly important in the light of the special features and trends of this process in Hungary, outlined below.

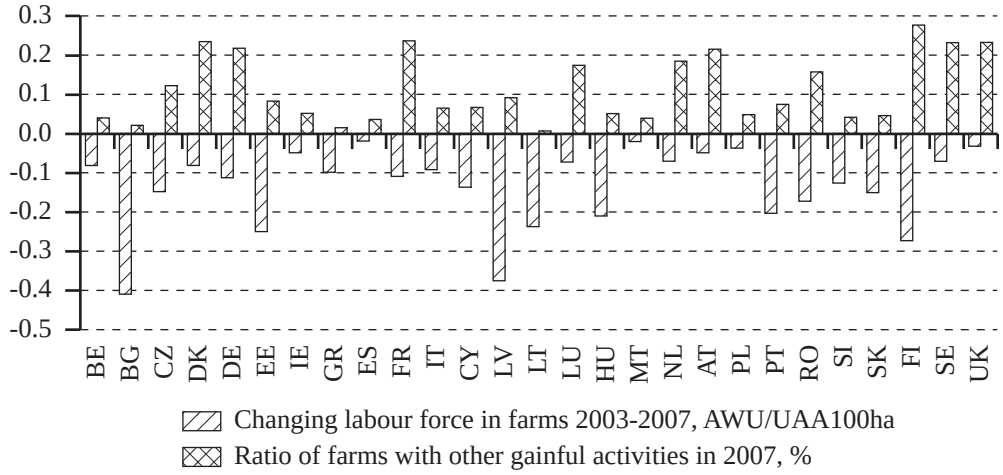

Figure 4: Changes in the annual work units per 100 ha agricultural area and the ratio of farms carrying out non-agricultural activities in the EU-27 countries

Source: Own calculation and composition from Eurostat – Farm Structure Survey

Between 2000 and 2007 the ratio of Hungarian farms involved in non-agricultural activities was around 5%, and this number was declining (GSZÖ, 2007). In 2000 the country would have been ranked in the last third compared with the EU member states, and this position had not improved by 2007. The Hungarian ratio is less than half the average for the EU-15 or EU-27 countries. The gap is biggest for the categories 'production of renewable energy resources', 'contractual work' and 'other gainful activities'. However, Hungary had an above-average rate for the processing of agricultural products (Eurostat, 2010). By the end of the period up to 2013, it is planned for the number of farms carrying out other gainful activities to rise from the low value recorded in 2005 (38,500) to 47,000,

representing 9.4% of the farms (New Hungary... 2007). It should be noted, however, that this will still be below the figures for 2003.

Research carried out between 2006 and 2010 revealed new groups of background factors influencing the rate of farm concentration, employment, diversification and multifunctionality (Fehér et al., 2010a, 2010b).

5. Motivation of Hungarian farmers in three LEADER microregions

The survey referred to above has confirmed the correlations between farm concentration and the labour requirements per unit area. Farms of between 50.1 and 100 hectares required a 70% smaller labour force per hectare than those with an area of less than 50 hectares, while those with more than 100 hectares of land employed only a seventh of the labour force per hectare required on farms measuring less than 50 ha (Fehér et al., 2010b).

The following factors provided motivation for farm concentration on the mostly individual farms included in the survey:

1. *The farmers, or the managers of companies, were motivated most strongly by the desire to develop and expand the farm and to provide a better living for the family*. Among the reasons given for farm development decisions, the slow but sure development of the farm and the provision of a living from the farm for as many family members as possible were ranked first and second in absolute terms, and 81% of the 101 respondents put one of these motives in first place. The production of healthy foodstuffs and the maintenance of the environment came much lower on the list.
2. *Among the means available for achieving growth, the farmers considered land purchase to be the most important*. In response to the question, "What type of changes would best serve the interests of the family", most respondents ticked land purchase in order to increase the area of land they owned. Some 54% of the farmers were planning to expand their farms over the next 5–10 years, and more than half of these farmers were thinking in terms of land purchase. Increasing farm size by renting land was only put in fourth place.
3. *The farm concentration processes occurring in their microregions were accepted by 45% of the farmers, who agreed that these were necessary*.
4. It is worth noting that *creating jobs for outsiders was ranked last*. The desire to increase the amount of income available for spending, and the acquisition of more state subsidies came in the middle of the list. However, in response to a question about the relationship between the family and the farm, the desire for *as many family members as possible to find a full-time job within their own farm* was ranked first. The part-time employment of family members and help in finding jobs outside the farm came in second place.

In the course of structured interviews factors that weakened farm concentration also became evident. Special mention should be made of the restrictions on land purchase by companies and the inadequacy of land mortgage loans. However, the effect of these factors is far less than that of factors that encourage concentration.

Among the holdings surveyed, the ratio of farms carrying out non-agricultural activities was 17%, far higher than the Hungarian average. It should be noted, however, that this could be attributed primarily to the ratio of *non-market-driven activities*. These include landscape management, nature protection and agricultural environment protection.

The *aggregated non-agricultural diversification index* (see footnote 3), was low comparing the average values. This means that relatively few of the activities surveyed were carried out on the given farms. The values of these indexes were influenced mainly by direct sales of farm products as well as by non-market-driven activities,. Mention should also be made of agricultural product processing and other non-agricultural services. Some 43% of the respondent farmers are planning to introduce or expand some form of non-agricultural activity in the future.

The survey cast light on the fact that *the farmers concerned did not associate multifunctionality with the creation of jobs for outsiders*. Despite the tensions caused in these microregions by unemployment, the *urgent need to introduce flexible forms of employment was put near the bottom of the list*. In reply to another question, this was *clearly regarded as a state responsibility, in which they had little role to play*.

6. Role of agricultural and rural development payments in orientation and incentives

Even during the previous planning period (2004-2006) it could be seen that, compared with the EU-15 countries, investments and environmental issues made up a far higher proportion of agricultural and rural development payments in Hungary than supports encouraging diversification and alternative sources of income. The majority of the payments for investment resulted in developments that replaced manual labour and contributed, directly or indirectly, to the loss of jobs on farms. Among the agricultural environment protection measures, the support of farming methods that required less manual labour had a similar effect.

In a study on the distribution of rural development payments in the EU-8+2 countries over the 2007-2013 period, Forgács (2010) revealed that measures designed to improve the competitiveness of agriculture (Axis I) had the second highest ratio in Hungary, exceeding the average for the ten countries by three percentage points. At the same time, the ratio of funds earmarked for improvements in the quality of rural life and for the diversification of the rural economy (Axis III) exhibited the second lowest value, 5.6 percentage points lower than the average.

Within the payments for investments, special attention should be given to those for machinery investments. These shift the ratio of machine work to manual work (which is regulated by the market) towards the former. This negative discrimination is aggravated by the high tax on live labour. The relatively high proportion and total sum of machinery investment payments only serves to encourage the endeavours of Hungarian farmers to carry out all farm operations using their own machinery. The extra capacity available as the result of successful grant applications needs to be utilised, but instead of taking advantage of the existing machinery, other farmers prefer to seek support for machinery of their own. The existence of unutilised machinery capacity tends to trigger a further increase in hectarage of the farm, leading both in itself and due to the replacement of human labour in a reduction in jobs.

Payments for the mechanisation of traditional agricultural activities within the Hungarian national rural development programmes accounted for 13.2% of the available resources between 2004 and 2006. Plans for the 2007-2013 period foresee this figure rising to 17.7% (AVOP-PKD, 2006; NHRDP, 2007).

In the three microregions surveyed, *responding farmers put the level of mechanisation in their own farms at medium to good. Nevertheless, the purchase of new machinery was given prior-*

ity in their development plans, the aim being to carry out all major farm operations at a higher standard, using their own machinery. None of the farmers surveyed belonged to a joint machinery purchasing and operating group, and there was no attempt to coordinate their plans for improving capacity.

The experience gained in several EU member states suggests that under certain conditions the spread of farm diversification and pluriactivity may help to stop the decline in farm employment and in some cases may even be capable of reversing this process. The means and resources utilised to stimulate such activities in the framework of the national rural development plans are thus of prime importance.

A study prepared by the Agricultural Directorate-General of the EU compared the annual work units per farm on diversified and non-diversified holdings in EU member states on the basis of data for 2005 (EU Directorate-General, 2008). The differences are illustrated in Figure 5. (It should be noted that due to the different mean sizes of the two groups of farms, it would have been more informative to give the number of work units in terms of land area or European Size Units.) It is quite clear from the figure that although the difference in the number of jobs available on diversified and non-diversified farms in Hungary, in terms of annual work units, was already obvious in 2005, the level of payments for diversification, and thus for the creation of jobs on farms, planned in the New Hungary Rural Development Programme, was very modest compared not only with the EU-8+2 countries, but also with the EU-27.

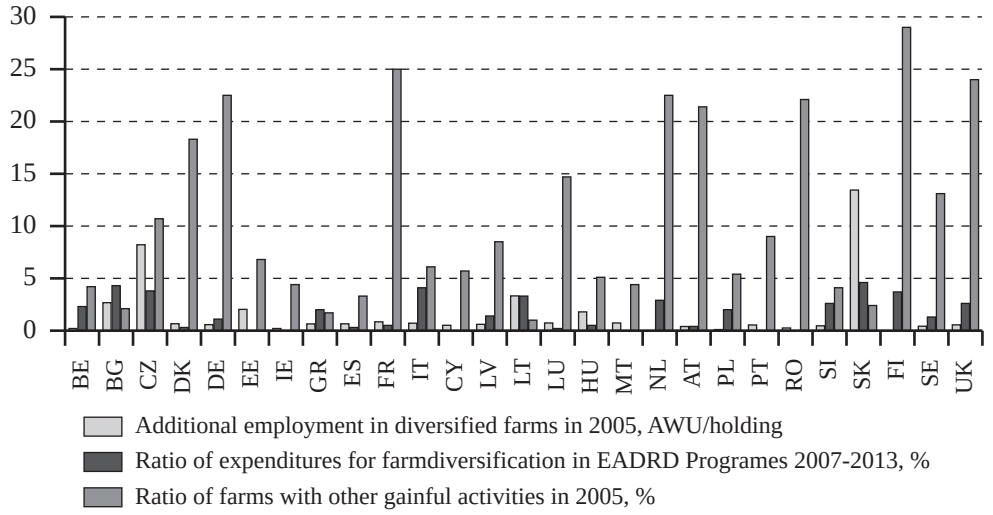

Figure 5: Parameters characteristic of farm diversification in EU member states

Source: Own calculation and composition from Eurostat – Farm Structure Survey

7. Conclusions

1. In the opinion of the authors, *the increase in farm concentration and the decline in the number of people employed in agricultural work on farms, expressed as Annual Work Units, can be regarded as simultaneous, interrelated processes which began well before the current financial crisis, not only in Hungary but in other EU member states*.

2. In terms of average farm size (both in hectarage and ESU), Hungary belongs to the group of countries with values well below the EU average. In addition, the country is characterised by a large labour force per unit area and a high rate of unpaid labour. Since EU accession both farm concentration and the rate at which jobs in agriculture are declining have reached a level far exceeding not only the EU average but also the average for the ex-Socialist countries. This appears to confirm earlier predictions that "Hungarian agriculture would soon be laying off more workers than in previous years" (Fehér, 2005:186). At the time the solution was thought to be a radical increase in the rate of farm diversification and the spread of the European Model of Multifunctional Agriculture to Hungary, and this still appears to be the best solution during the current crisis.

3. With regard to farm diversification and pluriactivity, however, Hungary trod a path quite different to that of the European Union as a whole and of the other EU-8+2 countries during the 2003-2007 period, and the proportion of farms carrying out "other gainful activities" dropped to less than half during the first four years after EU accession (Eurostat, 2010). In addition to the increase in land concentration, the low level of non-agricultural activities appears to have played a role in the loss of jobs on Hungarian farms.

4. It seems highly probable that farm concentration can be largely attributed to the desire of Hungarian farmers to expand their farms, primarily by means of land purchase. It would also appear that the endeavour to ensure a better living for their families explains why even farmers who have diversified their farms to include non-agricultural functions are not really interested in creating jobs for non-family members. There is every likelihood that non-market-driven forms of diversification (landscape management, nature protection and agricultural environment protection), which are closely linked to EU payments but make only a modest contribution to creating new jobs, will continue to increase.

5. The reduction in the number of jobs available on Hungarian farms is aggravated by investment supports aimed at improving the competitiveness of farms. Special attention should be given to the increasing ratio and total sum of machinery investment payments. The modest level of resources earmarked for farm diversification and the diversification of the rural economy also plays a role in the unfavourable trend in farm employment.

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References

1. **AVOP-PKD** (2006): Programkiegészítő Dokumentum, (2004-2006) (PKD), (Programme-complement (PC) to the agriculture and rural development operational programme (ARDOP) (2004-2006) (modified by the Monitoring Committee on 16 June and 17 October 2005 and by written procedure August-September 2005), Budapest, www.fvm.hu.
2. **Burgerné Gimes**, A. and **Szép**, K. (2006): Az egyéni (családi) mezőgazdasági üzemek gazdasági helyzete napjainkban (The current economic situation of private (family) farms), Budapest: Agroinform Kiadó.
3. **Brouwer**, F., van **Rheenen**, Th., **Dhillion,** Sh. S. and **Elgersma**, A. M. eds. (2008): Sustainable Land Management (Strategies to Cope with the Marginalisation of Agriculture). Cheltenham, -Northhampton: Edward Elgar
4. **EU** (2008): Directorate-General for Agriculture and Rural Development, Economic analysis of EU agriculture, Brussels, 17 June, 2008, LTB D (2008) 17488 http://ec.europa.eu/agriculture/analysis/markets/gainful/text_en.pdf
5. **Eurostat** (2010): Online database, http://epp.eurostat.ec.europa.eu/portal/page/statistics
6. **Fehér**, A. (2003): Farmdiversification in SAPARD-microregions of Nortnern Great Plain in Hungary, Studies in Agricultural Economics 99:53-73.
7. **Fehér**, A. (2005): A vidékgazdaság és a mezőgazdaság (Rural economy and the agriculture), Budapest: Agroinform Kiadó
8. **Fehér**, A., **Czimbalmos**, R., **Kovács**, Gy. and **Szepesy**, E. (2010a): Motivation and intentions of farmers, as regards the development of multifunctional agriculture in micro-regions of Northern and Eastern Hungary. Studies in Agricultural Economics 111: 65-77.
9. **Fehér**, A., **Czimbalmos**, R., **Kovács**, Gy. and **Szepesy**, E. (2010b): Birtokkoncentráció, foglalkoztatás, diverzifikáció és multifuncionalitás, (Farm concentration, on-farm employment, farmdiversification and multifunctionality), Gazdálkodás, 45 (3): 286-294.
10. **Forgács**, Cs. (2010): Focusing rural development in Central and Eastern European countries, Studies in Agricultural Economics, 111:5-23.
11. **GSZÖ** (2007): Gazdaságszerkezeti Összeírás, 2007. (Farm Structure Survey) http://portal.ksh.hu/pls/portal/url/page/kshportal/adatgyujtesek/agrar_idosorok/gszo_2007/gszo_adatok
12. **Hamza**, E., **Miskó**, K., **Székely**, E. and **Tóth**, E. (2002): Az agrárgazdaság átalakuló szerepe a vidéki foglalkoztatásban, különös tekintettel az EU csatlakozásra, (The changing role of agriculture in rural employment with special regard to Hungary's EU accession) , Agrárgazdasági Tanulmányok 2002/4, Budapest: AKII
13. **KSH** (2009): Online database http://portal.ksh.hu/portal/page?_pageid=37,592051&_dad=portal&_schema=PORTAL
14. **New Hungary...** (2007): New Hungary Rural Development Programme, 19th February, www. fvm. hu

15. **Szabó**, G. (2008): Changes in the structure of agricultural production, farm structure and income in Hungary in the period of 2004-2006. In: Agricultural economics and transition: What was expected, what we observed, the lessons learned, (Vol. I and II) eds. by Csaba Csáki, Csaba Forgács. Halle: IAMO, 73-81.

16. **Tóth**, E. and **Hamza**, E. (2006): Az egyéni gazdaságok eltartó képessége, megélhetésben betöltött szerepe (Sustenance of private farms and their role in subsistence), Agrárgazdasági Tanulmányok 2006/2, Budapest: AKI

Structural and land use change of farms in the periurban area of Budapest – case study of Veresegyház subregion

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Abstract

During the last decade 80% of municipalities in Pest county recorded population growth – of which a significant part is as a result of people moving out from Budapest (KSH, 2009). Accordingly, areas in the vicinity of Budapest face high levels of urban sprawl. This has significantly contributed to the transition of farm systems in this periurban area, which in the Hungarian post communism context was and still is a challenging issue and has led to several socio-economic and environmental problems. Based on an in-depth analysis of the transformations of the agricultural production system and its environment (markets, institutions, policies and social changes) in the LAU1[3] area of Veresegyház, this paper identifies the conditions required to develop and maintain farm systems in periurban areas in a sustainable fashion.

Keywords

Farm system, periurban area, agricultural policies, rural development

1. Introduction

Periurban areas[4] will represent one quarter of the entire European Union (EU) territory in 2020, 80% of the population will live there and 40% of European farms will be located in such areas. The sustainability of those areas is a crucial question (EEA, 2006). The current challenges and possible future of sustainable agriculture production in peri-urban areas is discussed in detail by Poppe et al., (2009). Land speculation, the coexistence of rural and urban properties, and abandoned land are important images reflecting the difficulties of regional planning in such complex areas (Swinnen, 2007). The role of agriculture in those areas is emphasised in order to maintain open fields and produce landscapes whereas the competition for resources and land puts farmers in precarious situations (Pecqueur, 2004). The transition of farm systems in periurban areas in the Hungarian post communism context was particularly difficult (Timár, 2001). It had to deal with the issue of private ownership explosion using compensation notes, restructuring of local governments and the transformation of the entire agricultural sector from a collectivised system to a competitive, market based one which soon became part of a larger integration called the EU. As a consequence, in the Veresegyház sub-region for example, three images emerged from the landscape analysis: waste lands cover about 50% of open fields[5] causing health problems such as the diffusion of ambrosia (*Ambrosia artemisiifolia L.*) and environmental risks such as soil erosion; agricultural areas are taken over by residential areas and cultivated gardens are embedded in a very fragmented way.

The situation in the periurban area of the study creates a claim for new framework for agriculture, with new demands, but also with a competition for resources: labour, water and land in particular. The area is marked by very strong demographic growth, with significant spatial differences. The population in Pest county has increased by 14%, and in the Veresegyház region by 40%

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[3] Local Administrative Unit, formerly NUTS4
[4] Areas where urbanisation is continuous (without enclaves) and a minimum of 40% of the population works in the main urban centre or another municipality of the ring (OECD, 2009)
[5] Evaluation established from observation

since 1990. At such levels, we can really speak of "colonisation" of rural areas. The role and even the existence of farms in those areas are questioned. They are actually under a high land demand pressure, and concurrency considering the use of resources, but can we really say that there are "no more farmers?"

The objective of the study was to get a view on the change of agriculture in areas under urban sprawl (Schuchmann, 2000) and to measure the bases of those changes in order to propose agricultural or land use policies which could help to achieve sustainability. The LAU1 region of Veresegyház (Figure 1), which was chosen for a detailed analysis of the historical and current situation of farms, is a sandy hilly region located 30 km from Budapest on one of the main axes of urban sprawl of the capital city. This area is characterised by a high urban pressure ("dormitory towns" are indicated by a house symbol, and significant industrial activity by a chimney in Figure 1), and increasing abandonment of land. These changes are challenging several social, economic and environmental issues such as the development of invasive plant species, erosion and management of natural resources in general. In the long term, the region could even be threatened by desertification. Actually, agricultural and land planning policies do not take into account the importance of farms in the area (Vitális, 2003) and many of them could disappear in the next few years because of increasing construction of residential areas.

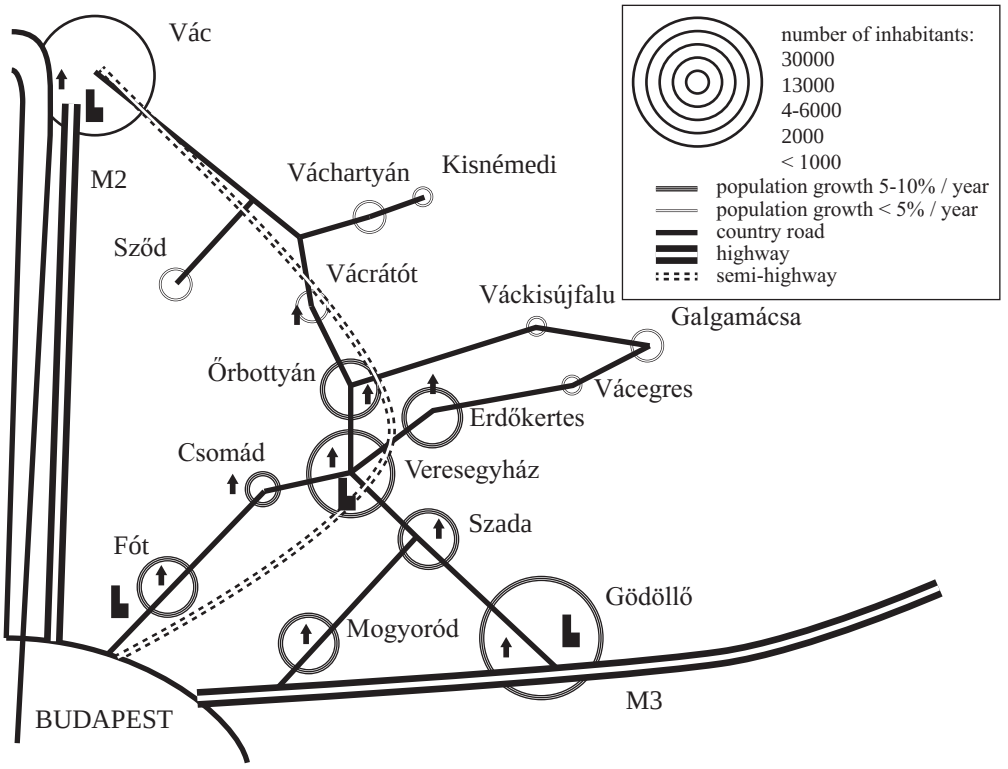

Figure 1: Overview of the study area

Source: own illustration

The study area is located on the east side of the river Danube (Duna), about 30 km north east of Budapest. It covers approximately 100 km² and nine communities from which seven were studied in detail. It is characterised by a dense hydrographical network, low agronomic potential (6-20 AK[6]) and the whole ecosystem is fragile and sensitive to erosion. The region is particularly interesting as the population has increased by more than the average in the surroundings of Budapest (+40%). The size of the study area was limited to one LAU1 in order to get a view on the diversity of farms presented. This also fits to public administrative points and historical coherence.

The area is characterised by high population densities and the landscape is highly transformed by human interference. Forests are located on hilltops and they cover about 34% of the space. Originally composed of oaks and beeches, these forests were later planted with acacias, chestnuts (17th-18th centuries) and fir trees (second half of the 20th century). The habitat of the area is grouped in villages located on the slopes next to the wetlands. The organisation of these villages is rather characteristic: dwellings and long individual gardens of different size village by village between 1,200 and 3,000 m² are organised along a principal road perpendicular to the slope, even if the land pressure modifies this original organisation of space. The landscape is different along a north-eastern south-western gradient on an axis of urban sprawl and characterised by different ecosystems.

2. Methodology

The method of analysis can be summarised in five steps:

- Historical analysis of the transformation of agriculture over 50 years through interviews of pensioners and former farmers and through local history books (Estók et al., 2004; Horváth, 1995).
- Landscape analysis in order to understand the interaction of farming activity with the ecosystem.
- Following a broad overview of farm systems present (60 interviews), a sample of 35 farms was chosen to cover the diversity found in the area. A typology of farm systems was established according to technical, historical and economic criteria.
- Thorough technical and economic analysis of each type of farm system to understand the logic, difficulties, opportunities and perspectives for development.
- Detailed estimation and comparison of farm revenues of different farm types.

The ecosystem and the proximity of the city were the first two factors of differentiation of agriculture in the study area (Bernard et al., 2006). The difference in the density of the farmers by village seems today to be explained on the one hand by the external factors (dismantling of distribution chains, land pressure and competition for resources, withdrawal or not of the co-operative of the area) described hitherto and on the other hand according to internal factors depending on the systems of production (production costs, market, water). In order to understand the current situation one has to understand the past which was leading to the joint evolution of the individual systems of production and the systems of co-operatives. This ultimately defines the existence of a real differentiation between the villages in terms of systems of production and in terms of density of farmers which would not be justified otherwise (e.g. based on environmental conditions).

[6] The "taxable net income" of each parcel of land registered in the land cadastre was established in the execution Act VII of 1875, and was later converted to Gold Crowns, the monetary unit of the Austro-Hungarian Monarchy. The Arany Korona (Gold Crowns) therefore AK is still serves as a basis of valuating agricultural land rents and prices. (Szabó, 1977)

The typology of the farms was established according to the system of production, the level of equipment, the size of the enterprise, the function of agriculture in the system of production and consequently of the interest of the owner. The economic survey was carried out starting from a sample of 35 complete investigations of farms. Given the diversity of the encountered cases, such a sample is insufficient with regard to representativeness. Nearly 20 additional partial investigations made it possible to check the validity of the established model; simply as a quick study at the borders of the area (Gödöllő and Vácrátót in area B, Sződ in area A, and Váckisújfalu in area C in Figure 2).

Once this typology was established, the second phase consisted of characterising each of these types of system of production, and more particularly of identifying their conditions of access to the factors of production (land, labour force, capital, water); and to characterise the technical and economic operation of these farming activities. The following points were considered:

- Basic information such as the legal statute of the activity, the age of the owner, size of the farming activity.
- Access to resources and their use:
  1. Land: surface, number of plots, localisation, strategies of land management, security of land tenure, private property, co-operative, etc.
  2. Labour force: number of people working in the enterprise, work schedule of the availability of labour, labour productivity and organisation of work. The peak periods of work starting from this study were identified.
  3. Capital: Characterisation of the level of equipment of the enterprise: level of mechanisation, buildings, irrigation infrastructure and means of transport. Analysis of the means of access to the capital: conditions of access to credit, access to subsidies; sources of financing of the development of the enterprise.
  4. Water: The conditions of access to water were also studied: systems of irrigation in place, direct access to water (brook) or indirect (well).

- Analysis of the history of the farm: under which historical times and conditions was the farming started, how did the farming evolve (process of accumulation of the capital, evolution of the choices of production, evolution of husbandries, etc.) in relation to the external socio-economic conditions. Analysis of projects and trajectory of the enterprise, the prospects, the strategies and the interests of the owner.
- Analysis of various systems of crops and animal husbandry present in the enterprise. For the cropping systems the applied technology, intensity of production, crop diversity and rotations, and the timetable of different activities were analysed. Similarly, activities related to the system of animal husbandry were analysed.
- Analysis of the interactions between the cropping and animal husbandry systems and analysis of raw and processed products in relation to the conditions of access to market and mode of marketing.
- Calculation of the economic performance of the farm from the information collected (evaluation of the price of the various tools and calculations of depreciation according to their real duration of use, etc), and work on the systems of taxations and subsidies applicable to the farmers. Evaluation of the added value of the different productions and calculation of an average agricultural income from the enterprise.
- Considering the importance of the double activity (pluriactivity) in the case of this periurban area, the systems of agricultural production were embedded to the entire activity done by the same enterprise/people.

- Economic modelling of the performance of each system of production starting from the economic results of the studied enterprises: creation of a "standard" model, economic performance evaluation of this system of production and characterisation of a "field of existence" of this system with a minimal threshold below which one does not find this system with this level of equipment, these husbandries; and a threshold maximum corresponding to a limit of existence of this system (management of the labour to the peak of work, another factor limiting the existence of the system beyond this threshold). The results of this modelling are then used to compare the various systems of production in the study area (Dufumier M, 2004).

3. Results

Characteristics of natural resource endowments

Along the axis identified above, we can differentiate three distinct areas by their physical characteristics, by population densities and by the type of system of agricultural production found there (Figure 2).

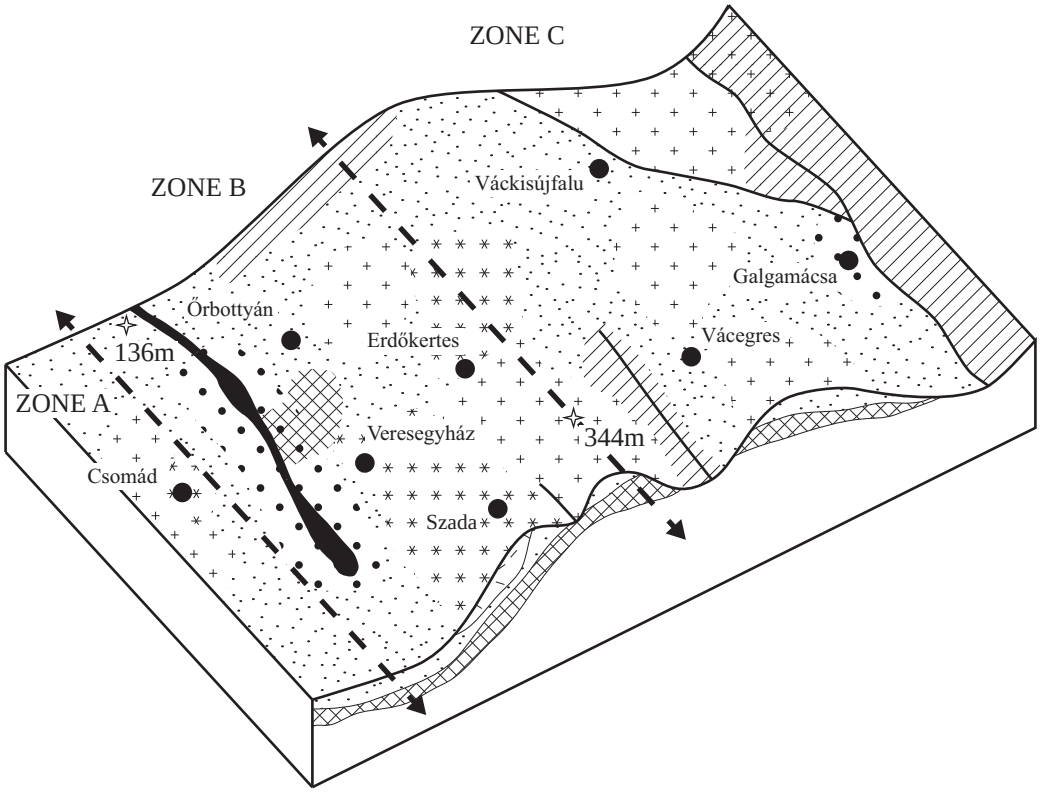

Figure 2: Overview of zones in the study area

Source: own illustration

Area A: Low lying area, sandy soils of the corrugated alluvial plain of the Danube

In the west - western south part of the study area, there is a identifiable alluvial plain at an altitude of 150-170 m above sea level of small hills with the highest peak at 200 m altitude. In this area, the soils, of sablo-muddy sandy nature, are of very low agronomic quality (6-7 AK). As a result, while certain very clayey soils are used for cereal production, most of this area is waste land connected with a landscape of dunes. Forest occupies a large part of the space. The systems of production of this area are dominated by animal production (bovine) and cereal crops. The population density is around 70 hab/km². In the neighbourhood of the single village of the area – Csomád – land is very fragmented into 1 ha or smaller pieces, but the main part is characterised by relatively large parcels (50-100 ha). A large orchard, with large number of individual owners, used to belong to a co-operative. This area is very close to Budapest (15 km), and the access by road is very easy. It is located today between two lines of urbanisation, the first coming from Budapest and the second separating area B. Urban pressure has been very strong since the beginning of the 2000s with in particular the establishment of industrial parks.

Area B: Wetlands around the brook Sződ patak and Southern slopes of the hills

This second area starts from the south-west and is characterised by the presence of a small stream, Sződ patak (alt 135 m) flowing from hills of an altitude of 250-300 m. Its source is a dense network of small secondary brooks. These wetlands with clay and sandy soils near Veresegyház are very favourable for market-gardening and are organised in very small parcels (1,500 m²) dominated by maize and sweet corn, cucumbers, beans, peas, celery, etc. The presence of a system of lakes and of a source of thermal spring water contributes to the attractiveness of this area. Therefore arable land is in competition with recreation related activities. Downstream, between the villages of Veresegyház and Őrbottyán, a clay outcrop is exploited for the production of bricks. At this level, the too argillaceous wet soils are not exploitable and form a marsh. Along the brooks there (near to Őrbottyán) are larger parcels. This is the only irrigable part of the area, where mainly maize and alfalfa are cultivated. The slopes of the hills are characterised by sandy or argillaceous soils. The high water table (1-3 m) allows access to water at low depth. They are very well suited to berry fruits and wine production in particular. This area is also marked by a rapidly increasing population density (200-300 hab/km²), historically from the manpower needs for wine production and market-gardening, and since the beginning of the 20th century, the periurban pressure has been very strong.It is located only 20 km from Budapest from which it easily accessible by road and rail as the transport infrastructure is good. The systems of production are principally fruit production or market-gardening, but the agricultural activity is very strongly competing with the residential pressure. The tops of these sandy hills, historically forested areas, are now under strong pressure of urbanisation too.

Area C: "Rural" hills and the Galga valley

The peaks of the hills of the area B mark the transition towards a more rural, and more remote area. The slopes are steeper and the brooks, Egres patak and Galga, are in more marked valleys. The Galga marks the limit of this sandy alluvial delivery point. From south west to north east one finds initially a great percentage of forest (80% of the lands of the village of Vácegres) and, at the border with the area B, an area favourable for the fruit production. There is a large de-collectivised orchard (nuts, apricots, apples, grapes, cherries), and some niche agricultural activities: seedbeds of fir trees and aromatic plant production (lavender). The sablo-muddy soils are light, low in humus and erode easily. Moving towards the south west, land is used to grow cereals. On the northern side of the Galga soils are richer in clay and in humus. The land use systems of this area C are especially used

for cereal crops and livestock production (bovines). This area is clearly different from the others and marks the limit of the urban development. Located 30 km from Budapest, access is much more limited. The population density of these more rural areas is lower (50-60 inhabitants/km²).

Specificity of the agrarian system in a peri-urban area

The historical analysis showed that a gradient between peri-urban and rural villages emerged clearly at the beginning of the 20th century. The development of Budapest and its urban market, the development of horse drawn carts (1873), the construction of residential houses and the railway of Veresegyház (1911) contributed to creating a potential for a local market for villages located in the area (Figure 1). Peasants benefited from higher prices for products than in rural areas and could strengthen their political and economic positions. The socialist-communist period deeply transformed the agrarian structure and the use of the ecosystem. The roots of the social and spatial organisation lie in the farming structure before 1945 and sometimes before 1848. For instance, the long individual gardens along the slopes remain an important element of land management, whose roots lie in the feudal fragmentation of land.

Today, most of the farm systems look toward the local market and use its potential by developing close relationships with consumers, local restaurants and hotels and by widening their range of products. For example, farmers organise exchanges with local bakeries (eggs for bread) or set up 'pick your own' systems. Moreover, possibilities for local jobs also help to maintain small farms through pluriactivity. The mixed social composition of periurban areas thus appears as an opportunity to maintain farming activity. The periurban situation and the low quality of land also contribute to the rapid growth of goats milk production because of two local opportunities: the free grazing on the large areas of waste land and the high price of goats milk and goats cheese on the local market (about 0.92€/litre). This trend is interesting to note as really specific of those periurban areas.

However, the competition for water, labour and land is high and has caused the disappearance of some production systems. For instance production of tomatoes and paprika under greenhouses is gradually disappearing from the area as the water capacities of individual wells has declined by 50% in ten years[7], increasing the costs for this form of production which is highly water demanding. Moreover, with unemployment rates under 3% in this periurban area, the lack of labour force has also contributed to the reduction of market-gardening. The competition for land is particularly high for those family farms whose fields are concentrated inside or at the edge of villages. Finally, farmers also face constraints on animal husbandry, application of pesticides and vehicle movements. They develop new tracks through the fields for traffic, modernise or delocalise their cattle installation and change their labour schedule, working at night when this is possible. The periurban localisation thus presents both advantages and handicaps for farmers, but the residential pressure and land speculation are critical determinants and without stronger regulation most of the farming activities in the area are very likely to disappear in the long term (Swinnen, 2007). The new market opportunities are only available to those farms that are able and ready to adjust.

[7] From interviewees' statements in the village of Szada.

The typology of farms

Based on the approach given earlier, a typology of the farms was established. The main characteristics of the different farm types identified can be summarised accordingly:

- The first category is mainly pensioners cultivating a piece of land with very little equipment mainly for own consumption. This category is likely to decrease with social change.
- The second category is households or families combining farming with a local job or individual enterprises in other sectors. Those specialised and equipped small systems have the economic potential to survive and develop but the development pressure on family lands located near to residential areas could lead to their disappearance.
- The third category is family farms working with old equipment and producing many different products. Their survival in the area is due to high prices on the local market and EU subsidies but their situations are often precarious, especially because of land and financial barriers. In villages located in more rural areas, the opportunities for development are higher.
- The fourth category is large family farms. Those were the main target of EU programmes (SAPARD, AVOP) and developed on the basis of owned land and modern equipment. Those farms combine high production performances (9,700 l milk per year per cow) and exploitation of local opportunities (direct delivery of milk, educational visits) and develop in different fields such as energy production from biomass.
- The fifth category is the successors of cooperatives. Those enterprises survive and modernise thanks to EU subsidies but after 2013 their situation could be much more precarious and they could be integrated by agro-business firms.
- The sixth category of farm system is the successors of state farms. Land and infrastructure (machinery, buildings, etc.) were privatised and often integrated into business enterprises often involved with external trade.

Table 1

The main farm system and their perspectives for development

Type	Size, cattle	Products and services sold	Market	Proportion in the total area	Revenues* AR AR/R
Subsistence/semi-subsistence. farms	1-2 ha owned	Fruits and vegetables	Local	55%	1,5-2,500 €/y 12-40%
Complement to other incomes	1-6 ha owned	Mainly fruits, wine	Local, global	25%	1,5-5,000 €/y 10-50%
Small-size family farms	30 ha owned/rented 5 cows	~All products +Agricultural services	Local	15%	4-6,000 €/y 50-100%
Large-size family/ entrepreneurial farms	300 ha owned/rented 200 cows	Milk, cereals, agricultural services	Local, global	2%	75K€/y 50-100%
Successors of the cooperatives	1000 harented	Cereals, crops	Global	2%	20K€/y -
Integrated capitalistic enterprises	45 ha owned	Aromatics products, import-export	Global	1%	-

* AR = average agricultural revenues, including subsidy revenue per active person (~ full time) and per year. It was calculated from the method for agrarian diagnosis (Dufumier, 2004). The ratio AR/R represents the part of the agricultural revenues among the whole family revenues. In case of enterprises, AR correspond to the annual average revenue (no direct link with fiscal revenue).
Source: own calculations

According to the observations and statistical data concerning the study area, the distribution of the various systems of production in the study area can be evaluated as follows:

Table 2

Comparison of arable land quality, price and rent for different system of production (SP)

System of production	Share of area	Expected future changes
SP1	30%	Decreasing
SP2	40%	Unchanged, but decreasing in the long term
SP3	10%	Unchanged
SP4	10%	Unchanged
SP5	9%	Unchanged
SP6		Unchanged
SP7		Increasing
SP8	1%	Increasing
SP9		Decreasing in the long term

Source: own compilation based on KSH

Thus, 80% of the area is cultivated by small farms. The various types of medium sized family farms account for 9% and the large farms account for 1% of the farms.

Once this typology was established, the second phase consisted in characterising each of these types of systems of production, and more particularly to identify their conditions of access to the factors of production (land, labour force, capital, water); and to characterise the technical and economic operation of these farms.

The special issue of land market: consequences of an institutional vacuum

Land issues are the first and most important question in periurban areas. In the study area, it can be observed that following the restitution process, land gradually concentrated under various owners who participate in local governments and make a profit from the transfer from agricultural land to residential land. This type of land speculation, broadly shared in periurban areas across Europe, is a real issue as urban sprawl, planned at a municipality level[8] is under the control of private interests. The institutional vacuum for land regulation during the transition period and the difficulties of dealing with a very fragmented ownership are some of the reasons explaining the significance of waste land. There are certainly also economic reasons behind this phenomenon, e.g. the very low profit level of farming in general.

Actually agricultural land can be used for free or at very low prices by farmers but without any guarantee from the owner and any institutionalised rent contract, thus farmers cannot get access to credit or subsidies to modernise their operation. In order to handle this situation, some land planning tools inspired from French best practice for example, could be used, such as the protection of fragments of agricultural land by public acquisition or through territorial projects involving every local actor (Charvet and Poulot, 2004). This kind of project is already in place in the south western hinterland of Budapest through regional natural parks. However, considering those issues over the whole periurban area could be a priority to give farmers a long term view and thus to promote the valorisation of open fields. Moreover, a land planning regulation at higher level than municipality

[8] Urban planning is based on a map indicating the location of land pieces established by municipalities every 10 years (1997, 2007).

(township or region) would also be an effctive way of controlling speculation. Whereas such planning and orientations should be officially led at township and regional scale, the efficiency of this control may need to be reviewed.

Table 3

Comparison of arable land quality, price and rent

	Quality of land (AK)	Price of arable land	Price of residential land	Rent for arable land
Hungarian average	17.5	1,000-1,800 €/ha	-	50-100 €/ha
Area A	6 AK	12,000 €/ha	15-20 €/ha	20 €/ha (or free)
Area B	6 AK	12,000 €/ha	15-20 €/ha	-
Area C	15 AK	8,000 €/ha	10-12 €/ha	50 €/ha

Source: own compilation based on KSH

These figures given in Table 3 and their comparison with the Hungarian average highlight the existence in the area of a speculative land market. The process of restitution was followed in the areas A and B by very significant land speculation at the beginning of the 1990s, implying today a very unequal structure of property distributed between urban small holders who do not cultivate the land (1 ha), of peasants who do cultivate the land (1 to 6 ha for the great majority of them), of peasants who also do not cultivate the land (20 to 30 ha of property), some big landowners, owners or speculators land (500 ha) and the town hall of Veresegyház (more 800 ha). Only these last two categories of owners can today buy land while granting them planning permission, and even by building dwellings there. Thus, we can estimate that only 5 to 10% of the land belongs to those who actually uses it, including less than 1% of land used by small farmers. Even in these circumstances, it is possible to rent land for very a low price or even free but:

- They do not have any lease of enterprise and are limited in the subsidies which they can receive from the EU.
- Their precarious land tenure is a brake to justify any sustainable project and to obtain subsidies for investments.
- The future insecurity (in particular near the villages) leads to the blocking of any investment in long-term plantations.

A precursory sign of the progression of urbanisation, which appears in the analysis of land prices, is that this process gradually moves towards area C. Problems with land are amplified by the periurban situation. According to the many “for sale” signs, it seems that the land market is more active. The prices are quite striking, 12,000 €/ha is ten times higher than the average value of agricultural land in Hungary, about 1,000-1,800 €/ha (according to quality), and this is in spite of the very low agronomic quality of land. The decision of the owners to sell/buy is inspired by speculation on the future of this land market: the urban development and the possibility that this land is granted planning permission (leading to a 20-fold multiplication of the value of the land).

4. Discussion

Systems of production (SP) SP1 and SP2 are mainly dedicated to subsistence farming. Interestingly, these family based "enterprises" have usually existed for several generations and have their own tradition regarding what and how they are doing. Those SP have been in decline since 1990 and could disappear in the short or medium term with the social changes within the families and the loss of the agricultural knowledge by the younger generations. On the other hand, in the category of the specialised enterprises "doubles active" (SP3) or of the middle size farms (from SP4 to SP8), the owners are between 30 and 60 years-old, there are many installations of young couples (in particular in double activity) and the renewal for the generations of the middle size enterprises is often considered. In this periurban area, the share of an agriculture of "subsistence" is falling and leaves room to an agriculture "oriented towards the local market" in growth.

In this periurban area, one of the most characteristic and notable phenomena is the importance of double activity. This causes a complete change in the analysis of the viability of a system of production. There are five types of double activity in the area:

- active pensioners: this is an extreme case of the definitions of double activity. The result is however, that due to their agricultural activity, these people have two sources of income. SP1
- double active having a paid job without any historical background in agriculture and farming during their spare time (SP2, SP3).
- enterprises holding agricultural activity and other rural activities in other sectors, services or industry (SP4, SP8)
- double activity by the provision of agricultural services (SP5, SP6).
- double activity in households (SP7)

The double activity provides several functions in the households:

- security of incomes and guarantee against the climatic risks and of market, in particular for the fruit production and market-gardening productions.
- financial resources for the purchase of the inputs as the year progresses.
- source of capital for the enterprises
- optimised use of labour

It is important to note that this phenomenon is particularly developed in Hungary. Beyond the historical character of double activity in Hungarian history; this evolution seems to be the result of an evolution of the farms during the transition period characterised by 15 years of economically unstable and non-targeted subsidies. Moreover, double activity is today particularly significant for the less subsidised systems of production, i.e. fruit and vegetables. It is also related to a possible combination of these systems with other systems of activities which are particularly favourable for the farms in fruit production and market-gardening. However, one could suggest that double activity would be presented in the form of a reaction of survival for the farms on an assumption without subsidies.

The system of subsidies, the system of credit, the structures of accompaniment such as they currently exist in Hungary, aim "to support the development and the modernisation of viable systems". Considering the results of the economic analysis, the definition "what is viable" as "a system of big size" can be discussed; because it appears that the large operations which are successors to the co-operatives which are subsidised are precisely structures which are viable in the long term

only under condition of subsidies. One may also add that especially in a periurban setting these are not the ones best suited from an ecosystem sustainability point of view. For example the use of the ecosystem in area A for cereal crops is definitely not an optimal use of the given ecosystem. Without falling into the extreme reverse to carry the maintenance of microenterprises/small-scale farms in a situation of survival, our analysis makes it possible to affirm that there are other types of "viable and reproducible systems", even without subsidies (systems SP5 or SP6 for example). These systems of small- and medium size are all more viable within the analysed area, as they answer a local demand for products (SP3, SP5) and services (SP6, SP7, SP8). It would consequently be interesting to identify what could be the proposals for a necessary adjustment so that the farms can develop in a sustainable manner.

A first crucial characteristic of this agrarian system is the diversity of the systems of production in a given area. If this diversity bases its origin on the ecosystem, it seems that the situation in a periurban area takes part in the diversification of the trajectories of the farming activities. These areas indeed benefit from more advantageous conditions than a rural area in terms of access to the markets and they adapt to a local demand in products and services.

The pluriactivity of the farms is the second essential element of comprehension of logics of operation of farms in such an area. The structure of the agrarian system appears as dual with large farms, successors to co-operative structures, turned towards the competitive world market which go towards increasing integration based on production; and a multitude of enterprises answering to demands other than the single production of commercial goods. These "enterprises" are frequently mixing agricultural and non-agricultural activities which are embedded in the local economy. The role of these "farms" in the area appeared very clearly during this analysis. They fulfil an environmental and landscape function with the maintenance of specific landscapes which give an added value to the area: maintenance of open spaces, with the effective battle against erosion, and with the fight against the proliferation of ambrosia. These enterprises are also the "fuel" of the local economic dynamics of these "dormitory towns" with an offer of local products and with the maintenance of small employers in double activity.

Thus, agriculture has its place in this territory and the dual structure of agriculture, specific of the Hungarian agriculture throughout its history, seems sustainable in the periurban areas, with the condition of a certain number of adjustments in the agricultural policies and the policies of regional planning. The measures suggested in the study would have a positive impact on the small and medium sized farms turned towards the local market of goods and services, which would be also able to adapt to face a new world context for agricultural produce. Indeed, climate change could involve a geographical reorganisation of agricultural production on a worldwide scale with periods of crises and "transition periods" (adaptation) related to the readjustment to a new situation. Increase in the cost of energy and the concerns about the ecological footprint could be arguments of valorisation of the local production. Also, the increase in the food pressure for the planet to nourish 9 billon people by 2050 could change, in the long term, the current balance of an agriculture which produces above its capacity. These three factors remain still variables likely to modify the agricultural production context.

5. Conclusions

This paper showed that the peri-urban situation can be an advantage for a farming system because of the high potential of the local market, but that the future of most farmers depends on an efficient local governance able to deal with all actors and lead toward a sustainable local project. The competition for land use is actually a determinant factor which could lead to the decline or even disappearance of many farming activities, whereas the analysis also showed the role of the diverse type of farm systems for landscapes, local economic and environmental benefits. Orchards and goat breeding are two distinct types of production which could offer opportunities for sustainable development in the study area if their development is framed by local institutions and accompanied by specific extension programmes.

References

1. **Bernard**, C., **Dobremez**, L., **Pluvinage**, J., **Dufour**, A., **Havet**, A., **Mauz**, I., **Pauthenet**, Y., **Rémy**, J., **Tchakérian**, E. (2006): La multifonctionnalité à l'épreuve du local: les enterprises agricoles face aux enjeux des filières et des territoires. Cahiers Agricultures 15(6):523-528.

2. **Charvet**, J. P. and **Poulot**, M. (2004): Conserver des espaces ouverts dans la métropole éclatée: Le cas de I' Ile-de-France. In: Dorier-Aprill, E. (ed.) Ville et environment. Paris: Sedes, 215-248.

3. **Dufumier**, M., (2004): Agricultures et paysanneries des tiers-mondes, Paris, Editions Karthala, 77-109.

4. **EEA** (2006): Urban sprawl in Europe: The ignored challenge. Copenhagen: European Environment Agency.

5. **Estók**, J., **Fehér**, Gy., **Kunst**, P., and **Varga**, Zs., (2004): History of Hungarian Agriculture and Rural Life 1848-2004. Budapest: Argumentum Kiadó.

6. **Swinnen**, J. F. M. and **Vranken**, L. (2007): Review of the transitional restrictions maintained by new Member States with regard to the acquisition of agricultural real estate in Hungary. Center for European Policy Studies.

7. **Horváth**, L. (1995): Veresegyház története 1945-ig. (History of Veresegyház until 1945), Veresegyház: Veresegyház Nagyközség Polgármesteri Hivatala.

8. **KSH** (2009): Magyarország 2008 (Hungary 2008), Budapest: KSH

9. **OECD** (2009): The Role of Agriculture and Farm Household Diversification in the Rural Economy – Evidence and Initial Policy Implications. Report TAD/CA/APM/WP(2009)1/FINAL (April 21). Paris: OECD

10. **Pecqueur**, B. and **Zimmermann**, J. B. (eds.) (2004): L'économie de proximités, Paris: éditions Hermes-Lavoisier.

11. **Poppe**, K. J., **Termeer**, C. and **Slingerland**, M. (eds. 2009): Transitions towards sustainable agriculture and food chains in peri-urban areas. Wageningen: Wageningen Academic Publishers.

12. **Schuchmann**, P. (2000): Urban Sprawl in the Budapest Agglomeration Zone, Sprawl or Smart Growth. Budapest: Centre for Environmental Studies.

13. **Szabó**, G. (1977): Certain questions related to land economics in Hungary's agriculture. In: Economic Studies on Hungary's Agriculture. (Eds. Benet, I. and Gyenis, J.) Budapest: Akadémiai Kiadó, 46-63.

14. **Timár**, J. and **Váradi**, M. M. (2001): The Uneven Development of Suburbanization during Transition in Hungary. European Urban and Regional Studies. Békéscsaba: Centre for Regional Studies, Alföld Institute, Hungarian Academy of Sciences.

15. **Vitális**, Sz. (2003): Veresegyház és térsége agrárstruktúra és vidékfejlesztési programja. (Structure of agriculture and rural development for the region surrounding Veresegyház) Gödöllő: Szent István Egyetem.

The impact of the EU GMO policy on the competitiveness of the livestock industry

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Abstract

The stringent GMO policy of the EU adversely affects the competitiveness of the member states' livestock industries, in particular the poultry and pig sectors. This arises from the fact that the EU animal industry is highly dependent on the import of feedstuffs sourced from pro-GMO countries. The import is expected to face increasing difficulties especially due to two elements of the EU GMO policy: the prolonged approval process of new GM varieties and the zero tolerance threshold towards GMOs that have not yet received authorization. To overcome this problem the study recommends actions including the speeding up of the authorisation process and the introduction of a tolerance level for unapproved GMOs.

Keywords

EU GMO policy, zero tolerance threshold, asynchronous authorisation, soybean imports

1. Introduction

Over the last twelve years the cultivation of genetically modified (GM) crops have rapidly developed worldwide, especially in North and South America. All countries that play a key role in the agricultural market have adopted GM varieties on a large scale. The only exception is the European Union (EU) which created an unfavourable climate towards genetically modified organisms (GMOs). This anti-GMO stance creates advantageous economic circumstances for many players in the agricultural industry. But there are sectors being adversely influenced by the strict EU GMO policy. One of the most affected sectors is the livestock industry. This is because the EU feed industry is highly dependent on the import of soybean and – to a lesser extent – maize products. These feedstuffs are mainly sourced from countries where GMOs are widely used. Imports of these raw materials are expected to face increasing difficulties due to longer approval procedures of new GM varieties. The approval procedure in the EU takes at least twice as long as countries supplying feedstock.

This mismatch in time (so-called asynchrony) has not yet caused severe trade disruptions because there have been only a few GM varieties dominating the soybean and maize areas in the exporting countries. But the number of new GM varieties is likely to rise considerably in the future. Unless the laggard authorisation of new GM varieties speeds up, the import of EU soybean and maize is likely to encounter great difficulties. There will be GM varieties which have already been authorised in the supplier countries, but not (yet) in the importing EU. On top of that, this asynchronous approval couples with the operation of a zero tolerance threshold towards GM varieties that have not yet been approved (EU-unapproved GMOs). The EU does not tolerate the presence of unapproved GMOs, even as traces in a batch.

Given the complexity of the supply chain, it tends to become increasingly difficult to completely segregate EU-tolerant[2] varieties from EU-unapproved GMOs in times of quick expansion of new GM crops in the exporting nations. This results in a great upward pressure on the feed prices in the EU, leading to the loss of competitiveness in the husbandry sector.

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[2] EU-tolerant soybean – all soybean varieties that can be exported to the EU (EU approved GM soybean and non-GM soybean)

Numerous studies have been published on the effects of the EU GMO policy recently. (e.g. Aramyan et al., 2009; Backus, 2008; Cardy-Brown, 2008; DG AGRI, 2007) They outline several possible scenarios covering a wide spectrum of outcomes for the coming years. What they have in common is that they all forecast a massive spike in the soybean price unless the EU changes its GMO policy.

Objectives

The principal objectives of the study are (a) to analyse what negative impacts the EU GMO policy has on the competitiveness of various livestock sectors; and (b) to determine the possible measures that the EU need to take to overcome this problem. More specifically, the study analyses the following target areas:

- What influence do two key elements of the EU GMO policy – the prolonged approval system and the zero tolerance threshold – have on the import of soybean and maize products?
- Which animal sectors are the most affected by the rising price of these feedstuffs?
- What unpredictable factors in the exporting countries do affect the import of these raw materials?
- What is the scope of action for the EU to tackle this problem?
- What measures could the EU use most effectively to overcome the challenges?

Methods

The study has been based largely on relevant survey results conducted by the European Commission, the European Feed Manufacturers' Federation (FEFAC) and the Dutch Agricultural Research Institute (LEI). Numerous international literature supports the analysis (e.g.: Desquilbet, 2009; Lin and Johnson 2004; Brookes, 2002; Buckwell at al., 1999). The database of the FAO, USDA and the Hungarian Research Institute of Agricultural Economics has also been used in the examination. The study focuses mainly on soybean products, because the difficulties with soybean imports cause more problems in the EU livestock industry than maize imports.

2. Results

The first part of this chapter describes the importance of soybean imports in the EU. It covers the degree of dependency of the EU on imports from third countries and the replacement possibilities of this crucial protein-rich feedstuff. Then, the root of the problem is discussed: in what way does the European anti-GMO stance make the sourcing of soybean costly and impossible for the feed industry. The paper attempts to provide an answer on why the import of these feedstuffs comes under increasing threat in the light of the global trends. Also, the various animal sectors are analysed: which ones are the most sensitive to the fluctuation of soybean price. Lastly, the chapter focuses on the measures that the EU can take to overcome the problem.

2.1. The EU dependency on soybean imports

The EU animal sector is highly dependent on importing large quantities of soybean products from third countries. Soybean products play a crucial role as a protein-rich source in the feed of livestock. The degree of self-sufficiency of the EU in protein rich feedstuffs is only 28%. When it comes to soybean its rate is 3%. (FEFAC, 2009). In 2008, the EU-27 imported around 40 million tonnes

of soybean products, mainly taken up by the feed industry. The bulk of the imported raw materials comes from Brazil, Argentina followed far behind by the USA (Figures 1 and 2).

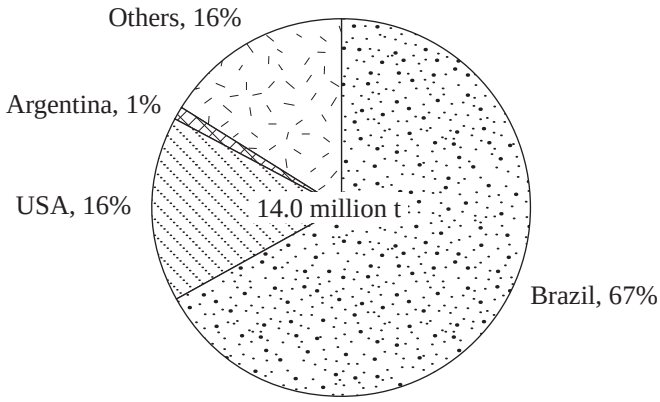

Figure 1: Source of EU 27 soybean imports (2008)
Source: Barros (2009)

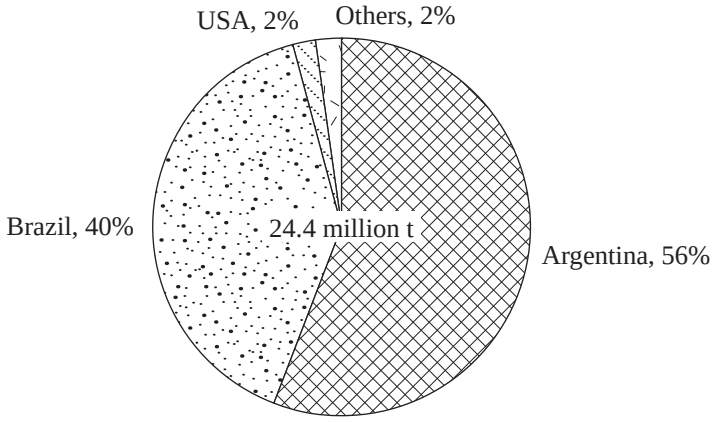

Figure 2: Source of EU 27 soybean meal imports (2008)
Source: Barros (2009)

Substitutes for soybean

There are limited possibilities for the EU to substitute the North- and South American soybean imports with alternatives because the climatic conditions narrow the scope to grow soybean on large scale in other regions. Besides, the alternative feedstuffs are not competitive enough. Substitutes can be derived from oil crops such as rapeseed or sunflower as well as protein crops like field peas or sweet lupins. But the production of these crops in the EU is costly compared to the soybean imports. (Vahl, 2009) This is a major problem because the production of compound feed is mainly

optimised on the basis of price. Small price differences can have major consequences, mostly on a globalising market. In addition, the alternative feedstuffs have less favourable nutritional composition (Cardy-Brown, 2008). According to DG AGRI (2007), at most 10-20% of the EU soybean import could be replaced by alternative protein-rich feedstuffs.

2.2. Soybean imports come under threat

The EU stance towards GMOs may suggest the use of GM products is quite low in Europe. But the reality reveals the opposite, at least when it comes to the feed industry. The EU livestock sector is highly dependent on the import of soybean. This raw material is mainly sourced from Brazil, Argentina and the USA where GM soybean is used extensively. The supply of this raw material in the EU encounters increasing difficulties as the EU GMO policy places a burden on the import of this GM feedstuff.

Asynchronous authorisations

In the oilseed exporting nations the approval process of new biotech traits is very quick compared with the EU. For example the authorisation procedure that takes on average 15 months in the USA requires at least 2.5 years in Europe. As the result, GM varieties authorised by supplier countries tend to spread on the global market without having a green light in the EU. In addition, this asynchrony is increasing very fast as the development of new biotech varieties gathers pace.

Until now there has not been severe disruptions on the soybean market due to the fact that there have been only two GM varieties dominating the GM soybean producing areas around the world since 1996. These varieties are called *Roundup Ready* (*RR*) and *Roundup Ready 2* (RR2). Both varieties have received green light for feed production in the EU (GMO-compass, 2010). The real threat draws from the fact that there is a considerable increase in the numbers of new varieties in the pipeline compared to what is presently on the market. There are currently nine new GM soybean varieties in the advanced R&D pipeline that are expected to be commercialised in the near future. Moreover, according to the forecasts the number of "commercialised events" will increase to 17 by 2015 (Stein and Rodríguez-Cerezo, 2009).

Zero tolerance stance

The major problem arises from the EU zero tolerance level coupled with the asynchronous approval procedure. This zero tolerance policy does not tolerate any biotech varieties – even as traces in a batch – that has not approved (yet) in the EU. Given the complexity of the soybean production chain, it is very difficult and costly for the operators to guarantee the absence of certain GM traits in the traded commodities. Along the whole supply chain extra measures have to be taken to keep the EU-tolerant GMOs separated from EU-unapproved GMOs (Figure 3). The mixing of products most likely occurs due to cross-pollination or traces left in containers and machines. But co-mingling can happen at any stage from breeding to distribution.

As the EU non-approved GMOs gain market share in the exporting countries, the segregation becomes increasingly difficult for EU-tolerant GMOs. The risk of contamination[3] grows and the sustainability of the EU food industry comes under serious threat. The costs of these extra measures for segregation – or so-called Identity Preservation (IP) – are analysed by a number of studies (Desquilbet, 2009; Lin and Johnson 2004; Brookes, 2002; Buckwell at al., 1999).

[3] The word "contamination" refers to 1. the presence of EU unapproved GMOs in a batch of non-GMO or EU approved GMOs; 2. the presence of EU approved GMOs in a batch of non-GMO

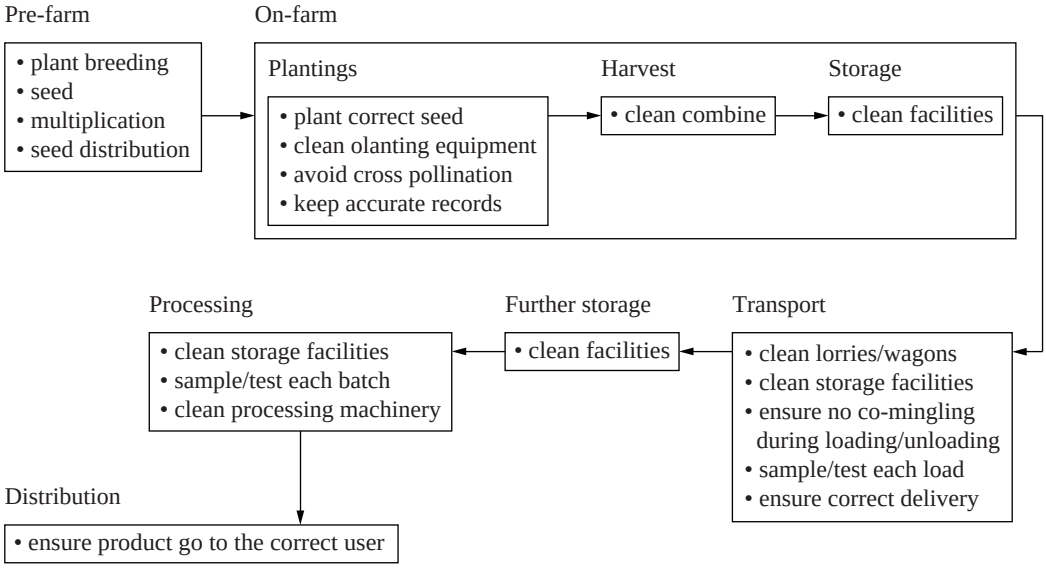

Figure 3: Stages and necessary measures of segregation

Source: own drawing based on the figure of Buckwell et al. (1999)

Emerging Asian markets

The situation is more alarming at a time when the EU is losing share in the global trade of agricultural products. Until recently the exporting nations took an interest in synchronising their authorisation process with the EU to some extent because the European imports made a great demand on the world market. But due to the emerging consumer markets of Asia (Figures 4 and 5), the suppliers are no longer bothered to match the strict EU requirements because their consignments are rather shifted to Asia.

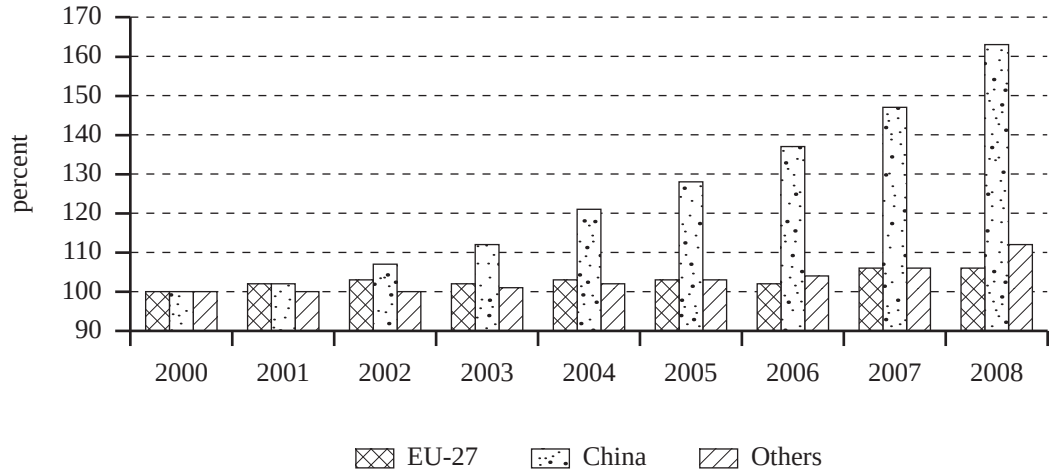

Figure 4: Evolution of global compound feed production (Index 100 = 2000)

Source: FAOstat (2009)

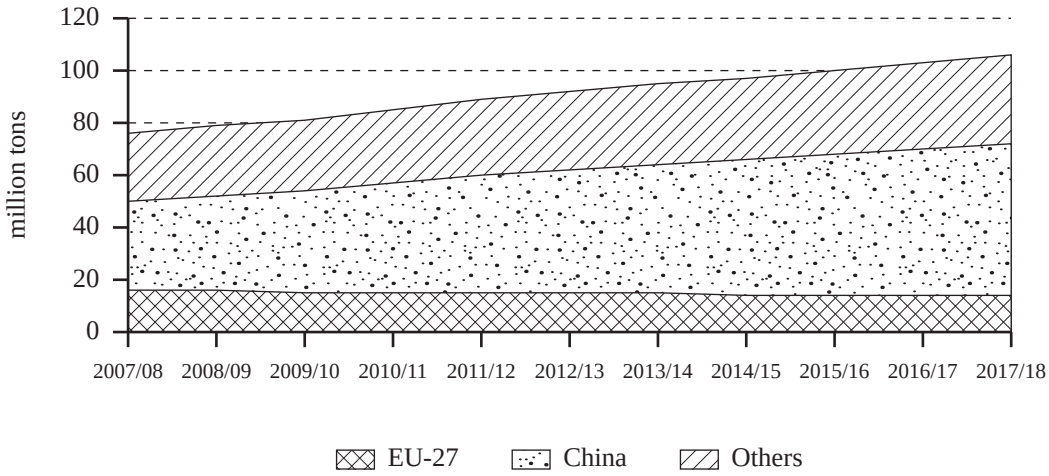

Figure 5: Outlook (2008-2017) – Global soybean import
Source: USDA (2008)

Similar situation with maize products

Beside soybean, the EU feed industry imports maize products (maize grain, DDG[4] and CGF[5]) from North and South America. These imports account for significant volumes in the years of poor harvest in Europe (including Serbia and Ukraine). But the slow EU approval process of GM varieties affects negatively the maize imports as well.

The USA used to be the major importer of maize products in the EU but the supply from the USA has greatly declined over recent years as the uptake of new GM varieties speeded up in North America. The operators are no longer willing to guarantee the absence of unwanted GM traces in the shipments. The EU can replace the greater part of the missing maize products from Argentina and Brazil where the approval of GM varieties is still in its initial phase. But imports are costlier from these countries than from the USA (e.g. the price premium for maize from Brazil was 50 €/tonne in 2008) (Cardy-Brown, 2008). The difficult import of maize products can further increase the price of feedstuffs in the EU. But this paper mainly focuses on the problems with soybean imports, as maize products have more alternatives for their replacement.

Uncertainties around the economic effects

Over the last two years numerous studies (Aramyan et al., 2009; Backus, 2008; Cardy-Brown, 2008; DG AGRI, 2007) analysing the adverse effects of the zero tolerance threshold and the laggard approval procedure in the EU were published. They outlined several scenarios covering a wide spectrum of outcomes. The one thing they have in common is that they all forecast a massive spike in the price of soybean unless the EU policy makers intervene. However, these effects cannot be easily quantified due to a number of unpredictable factors in the main exporting countries. Unforeseeable factors in Brazil, Argentina and the USA include:

- Speed at which the new varieties come to the market;
- Willingness of the operators in the supplier countries to fulfil the strict requirements of the EU;

[4] DDG: distillers dried grain which is by-product of bioethanol and starch production
[5] CGF: corn gluten feed which is by-product of bioethanol and starch production

- Willingness of the policy makers in the exporting countries to synchronise the GMO approval system with the EU regulations;
- Progress of the emerging Asian markets and its influence on the global soybean market;
- Size of area illegally sown to GM varieties that are not approved yet even in the exporting countries;

It would be very important to analyse these factors further in depth because this could help to assess the effects of the EU GMO policy more accurately.

2.3. Most affected livestock sectors

To assess the impact of the rising price of soybean on the profitability of the different livestock sectors, we have to examine the soybean meal content of various compound feeds and the share of feed costs in the total production costs in various animal sectors.

Soybean in feed

As an important protein source soybean plays a crucial role in feeding most livestock. In addition, its replacement in compound feed is strictly limited – contrary to other feedstuffs like maize. Based on the data by Profundo (Van Gelder et al., 2008), soybean plays the most important role in poultry and pig sectors in terms of soybean content of compound feed in the EU. Soybean meal accounts for 36.8% at broilers and 28.8% at pigs in compound feed (Figure 6).

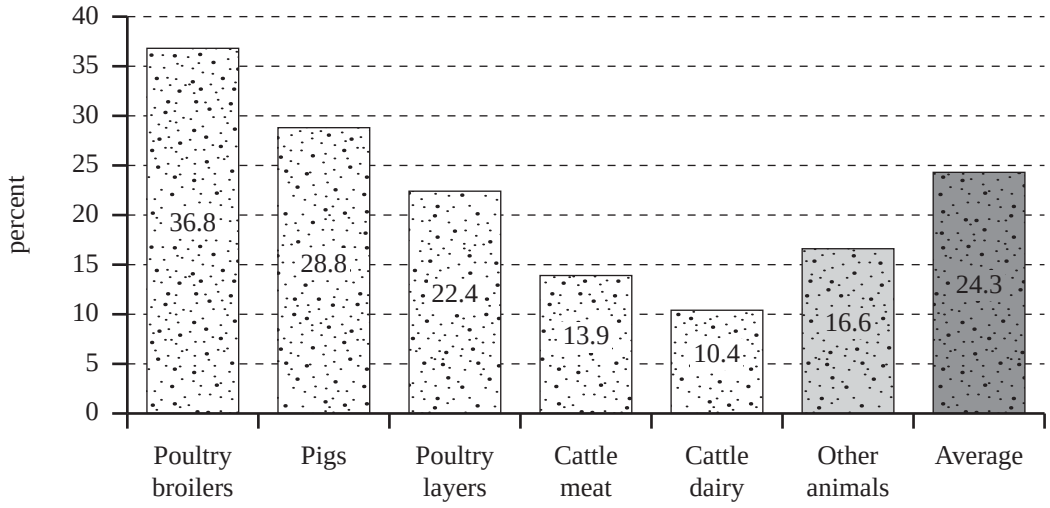

Figure 6: Soybean meal content in compound feeds in the EU-27 (2007)
Source: Van Gelder et al. (2008)

Feed costs in total expenditure

In general, the feed costs make up the biggest share of the total production costs in the animal sectors. Therefore these costs have the largest effect among the different expenditures on the profitability in the livestock industry. Figure 7 uses data of Hungarian Research Institute of Agricultural Economics (AKI) on the share of feed costs in the total expenditure in the various livestock sectors in Hungary. The numbers show the proportion of feed costs is by far the highest in the poultry sector

(61.6%). Given these numbers, we can conclude that the poultry sector is by far the most affected by the rising soybean price. Pig sector is also highly sensitive to the soybean price fluctuation.

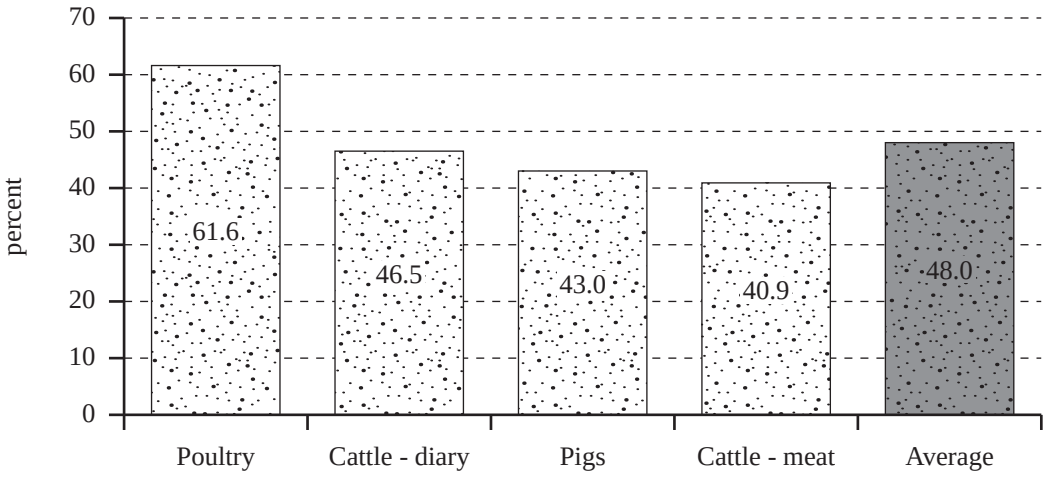

Figure 7: Feed cost in total production cost in the different livestock sectors in Hungary (2007)
Source: AKI (2008)

2.4. Options to overcome the problem

The analysis reveals the competitiveness of the EU poultry and pig sector is under serious threat. To tackle the problem there is some scope for action for the EU. These measures are listed below with their advantages (+) and disadvantages (-).

1. **Modifying the zero tolerance threshold** – the introduction of a minimal tolerance level for GM varieties that have already received approval in the supplying country but are still under authorization in the EU.
   + A threshold value would assure the suppliers that their shipments can enter the EU even if the consignment contains minimal traces of EU-unapproved GMOs. This could significantly facilitate the import of soybean and maize from third countries.
   - A tolerance limit entails the easing of the EU standards on GMOs. This could increase the health risk of the imported feedstuffs.

2. **Speeding up the approval process of GMOs** – used for narrowing the gap in time of approval procedures in the EU and the supplier countries.
   + Shorter length of authorisation could reduce the number of EU-unapproved varieties. This could encourage the export of feedstuffs to the EU.
   - The faster approval of GMOs could decrease the effectiveness of the EU's risk assessment procedures.

3. **Replacing soybean with alternative feedstuffs** by encouraging the production of alternative protein-rich crops with subsidies.
   + Alternative feedstuffs could decrease the dependency of the EU feed sector on soybean imports from third countries.

- The large-scale substitution of soybean with other oilseeds and protein crops encounters severe economic constraints because the cultivation of these alternatives is not competitive (as discussed in the "Substitutes for soybean" section).

4. **Campaigns for high-quality domestic products** – used for raising the awareness of the consumers that they can support the maintenance of the high-standardised EU food production by preferring the expensive EU meat.
   + Conscious consumers increase the demand of EU livestock products even in the case of their less competitive price.
   - The financial crisis and the decreasing purchasing power of the EU consumers undermine the success of the campaign.

5. **Providing technical support for segregation** in the exporting countries (e.g. improving the sampling and detection of GMOs or facilitating regions where EU-tolerant varieties are concentrated)
   + Technical support could enable the suppliers to meet the strict EU standards.
   - The EU has limited competence to influence the segregation practice in third countries.

The introduction of a tolerance level for EU-unapproved varieties is the most urgent step as it is to counter the negative short-term impacts. In the long run, speeding up the EU approval process is the solution. The other measures can only mitigate the problems.

3. Summary and conclusions

The analysis shows the EU livestock sector is under serious threat. This danger is mainly due to two elements of the EU GMO policy: the prolonged approval process and the zero tolerance threshold towards GM varieties that have not received authorisation (yet) in the EU.

The EU is highly dependent on imports of soybean products. There is no alternative but to source these feedstuffs from countries where GM varieties are widely used. The problem boils down to the fact that the authorisation of new varieties is likely to speed up in the supplying countries and the cumbersome EU approval process will not be able to follow it. This situation is exacerbated by the EU zero tolerance threshold.

EU imports have been a great demand on the world soybean market. Brazil, Argentina and the USA have been dependent on the EU market and they have been willing to adjust their approvals to the EU GMO policy to a certain degree. But because of growing demand from emerging consumer markets in Asia, they tend to feel less obliged to comply with the strict regulations of the EU and their consignments can be rather shifted to the Asian countries.

Since poultry and pig sectors are the most sensitive to soybean price fluctuation, they are the most affected by the EU GMO policy. The rising cost of soybean entails a serious adverse impact on the profitability of these sectors. This makes the operation of many EU poultry and pig farms unsustainable unless the present GMO policy radically changes.

The loss of competitiveness poses a severe threat to the EU animal sector. More efficient South American livestock farmers, notably from Brazil, may soon squeeze out the domestic products from the EU market. Hence the consumers in the EU will have to face the dilemma: give up their resistance to GMOs or eat Brazilian meat having been reared on EU-unapproved GM crops.

The current global trends of food industry as well as energy and environmental policy will require radical changes in the mindset of EU policy makers. The demand for agricultural products is projected to double in the next two decades as the result of growing population and the expanding biofuel production. However, the further enlargement of the current arable land areas is severely limited and the changing climate significantly deteriorates the conditions of farming in many parts of the world. These challenges do not leave any other option for humankind but to increase the productivity of agriculture. This will inevitably result in the further rapid expansion of GM crops around the world.

Among these global trends the EU is facing the decision whether to sustain the strict GMO standards by sacrificing a great part of its animal sector. It is a tough decision as the EU animal sector contributes around 40 per cent to the total agricultural income. I expect EU policy makers to ease the strict GMO policy in the coming years forced by the danger of losing a considerable part of the EU animal sector.

References

1. **AKI (Research Institute of Agricultural Economics)** (2008): Results of Hungarian FADN farms. http://www.aki.gov.hu/
2. **Aramyan L., Wagenberg C., Backus G.** (2009): EU Policy on GM soy. Tolerance threshold and asynchronic approval. Report 2009-052 LEI Wageningen UR, The Hague.
3. **Backus**, G.B.C., **Berkhout**, P., **Eaton**, D. J. F., **Franke**, L., **de Kleijn**, A. J., **Lotz**, B., **van Mil**, E. M., **Roza**, P. **and Uffelmann**, W. (2008): EU policy on GMOs: a quick scan of the economic consequences. LEI Report 2008-070. The Hague: Wageningen University and Research Centre.
4. **Barros**, H. P. (2009): EU 27 soybean and soybean meal imports in 2008. ABIOVE (Associação Brasileira das Indústrias de Óleos Vegetais) Personal communication.
5. **Brookes**, **G** (2002): Identity preservation of genetically modified organisms in the food chain: requirements, methods, and costs. J AOAC Int. 85(3):762-767.
6. **Buckwell**, A., **Brookes**, G. and **Bradley**, D. (1999): Economics of Identity Preservation for Genetically Modified Crops. CEAS Consultants, Wye, England.
7. **Cardy-Brown Co. Ltd.** (2008): Impacts of EU unauthorised GMs on the feed & livestock sectors. Report for submission to the European Sherpa Group. 10th October 2008. http://www.cardy-brown.com/wp-content/uploads/2009/01/impacts-of-eu-unauthorised-gms-on-the-feed-livestock-sectors.pdf
8. **Desquilbet, M. and Bullock**, S. (2009): Who pays the costs of non-GMO segregation and identity preservation? Am. J. Agr. Econ. 91(3):656-672.
9. **DG AGRI** (2007): Economic Impact of Unapproved GMOs on EU feed imports and live-stock production. DG AGRI report. http://ec.europa.eu/agriculture/envir/gmo/economic_impactGMOs_en.pdf
10. **FAOstat** (2009): Online database. http://faostat.fao.org/
11. **FEFAC** (2009): Feed & Food, Statistical Yearbook 2008. http://www.fefac.org/file.pdf?FileID=24622
12. **GMO-compass** (2010): GMO database on the authorization of GMOs http://www.gmo-compass.org/eng/gmo/db/
13. **Lin**, W. and **Johnson**, D. D. (2004): Segregation of non-biotech maize and soybeans: who bears the cost?' In: R.E. Evenson and V. Santaniello. (eds.): The Regulation of agricultural biotechnology, Wallingford, UK: CABI Publishing, 221-230
14. **Stein**, A. and **Rodríguez-Cerezo**, E. (2009): The global pipeline of new GM crops. European Commission, Joint Research Centre, Institute for Prospective Technological, Studies EUR23486EN.
15. **USDA** (2008): USDA Agricultural Projections to 2017. Washington D.C.: United States Department of Agriculture, Interagency Agricultural Projections Committee http://www.ers.usda.gov/Publications/OCE081/OCE20081.pdf

16. **Vahl**, H. (2009): Alternatieven voor Zuid-Amerikaanse soja in veevoer. Vahl Feed and Health http://commodityplatform.org/wp/wp-content/ uploads/2009/08/vahl2009 alternatievenvoor-zuid-amerikaansesojainveevoermrt2009definitief.pdf

17. **Van Gelder**, W., **Kammeraat**, K. and **Kroes, H.** (2008): Soy consumption for feed and fuel in the European Union. Profundo Research Paper. http://www.profundo.nl/page/show/publicaties

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