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CONTENTS

"Co-operative identity": A theoretical concept for economic analysis of practical co-operation dynamics[1]

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Abstract

Farmers' problems and co-ordination of agricultural activities cannot be solved simply by EU and/or government support, or by private market co-ordination institutions. Emerging producer groups and co-operatives seem vital in achieving bargaining power. Theoretically, and according to Western European (Dutch, Danish etc.) and US practical experience, one of the major important private institutions that can strengthen producers and help co-ordinate (agricultural) chains is the co-operative entity. To fulfill the basic co-operative aims and to compete in a more market-oriented environment (e.g. more liberal agricultural policies, opening European and world market, etc.) they will initiate new marketing strategies. To implement such new marketing strategies, co-ops have to collect more risk capital and in Western European agricultural co-operatives this is currently precipitating some fundamental financial and organisational changes. To retain the basic co-operative character, they are undertaking internal and external organisational changes, which in a number of cases will create so-called new co-operative structures/models. In this paper the "co-operative identity" concept (meaning the aims and functions of co-operatives, as well as the so-termed co-operative principles) is proposed to serve as a general theoretical background to evalaute economically the flexibility of (agricultural) co-operation. Also proposed is a new, interdisciplinary research focus (including comprehensive theoretical overview). This new focus examines the substance of co-operation and emphasises the importance of combining insights across the social sciences. It uses the results and common findings of economics, law, marketing, financing, organisational studies, management sciences ("hard" sciences), and also some elements of philosophy, psychology, sociology etc. ("soft" disciplines). Also recommended are some suggestions for further comparative research on the "co-operative identity". This is carried out according to each country and different branches and sectors to observe the substance and dynamics of co-operation from different economic and non-economic aspects.

Key words

Co-operation, co-operative identity, co-operative principles, strategy, marketing, co-ordination, vertical integration, agriculture

1. Introduction and background

Farmers' and co-ordination of agricultural activities cannot be solved simply by EU and/or government support, private-market co-ordination institutions, like *emerging producers' groups and co-operatives seem to be vital in establishing bargaining power* against processors, retail chains etc. Theoretically, and according to Western European (Dutch, Danish etc.) and US practical experience, one of the main important private institutions which can strengthen producers and help co-ordinate (agricultural) chains is the co-operative entity. Agricultural co-operatives used to be considered as the *classical form of co-ordination of varied and independent farmers*. Co-ops were founded in order to protect members against the large commercial and/or the often monopolistic or oligopolistic industrial companies. For

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example, in Holland and Denmark these co-operatives have emerged through a *voluntary base* (Meulenberg, 2000). They have a so-called "*dual nature*" toward the market: they are market oriented, but the surplus – made by the co-operative – goes to the farmer members. After deducting the co-operatives operational costs and funds for reserves, the surplus is distributed in proportion to their product amount delivered/paid to/bought from the co-operative.

In a market economy, generally the main economic aim of the (agricultural) co-operative is to *increase the income of its members*. However, other advantages are that co-ops can *reduce production costs and also decrease and internalize transaction (information) costs*, providing more continual information on consumer demand. Co-operatives can also *lower both economic and technological uncertainties and therefore decrease transaction costs* (Harte, 1997; Hendrikse – Verman, 2001b; Ollila – Nilsson, 1997; Royer, 1999; Szabó, 2002; Szabó – Fertő, 2004a,b).

This papers's *basic research problem* is the fact that the International Co-operative Alliance (ICA) Statement on Co-operative Identity (ICA, 1995) alone is *not a sufficient to grap the substance of (agricultural) co-operation*, at least not from an economic viewpoint. ICA has – through member organisations – about 800,000,000 members and this number underlines the importance of the statement. In some countries this "declaration" is the basis for legislations and/or for distributing different types of subsidies, tax redemptions etc.

It is also signficant in terms of public opinion because potential co-operative members form their view about co-operatives based on the widely known ICA statement (especially the principle of one-member – one vote). Therefore one could conclude that it is uncompetitive, inflexible and ideologically influenced and thus irrelevant to practical (economic) life. In turn, these perceptions *highly influence the public view toward co-operativs' economic justification and competitiveness*.

In this paper, a new "*co-operative identity" concept will be applied* to carry out *dynamic* and (perhaps later) *comparative analysis of* (agricultural) co-operatives. The concept of "co-operative identity" entails a *definition, and the aims and functions of co-operatives*. It also entails the so-termed *co-operative principles*, and serves as a general theoretical background for the economic evaluation of agricultural co-operation's flexibility. To develop the concept of "co-operative identity," as an empirical basis we have used trends in agricultural *marketing (dairy) co-operatives*, which adequately represent the processes occuring in the European Union. Empirical evidence supporting the theoretical results are based on examining agricultural marketing and processing co-operatives in the dairy supply chain. These investigations focus on dairy co-operatives' response to recent changes in the business environment.

This paper does not deal with other major market co-ordinating institutions, like marketing boards, agreements etc. (Lehota, 2000) and with the description of the co-operative development of transition economies. This is for two reasons. first, the paper describes the concept as an analytical and methodological tool with which it is possible to study co-operatives in a dynamic way. Later a major extension of the current study could entail comparative analysis. Second, at this stage, the author did not wish to deal with co-operatives in the transition countries. This was not only because because it is hard to collect reliable data on them, but also because they are mostly production type co-operatives which differ largely from *promotional* marketing type co-operatives which are the present study's subject.

To develop the concept and achieve the above mentioned goal the following were *essential*:

- research literature on co-operatives and co-operation, agricultural marketing and agribusiness,
- collecting secondary (statistical) data,
- interviews, discussions with experts on questions and problems on co-operative theory and practice,
- field trips and meetings with people working in the field,
- case study analyses.

The remainder of the *paper is organized as follows*: In the second section the author outlines the concept of "co-operative identity". In *Section 3* the author analyses the main links between various elements of the "co-operative identity". In *Section 4* the author discusses the limitations of traditional (marketing) co-operatives' and new agricultural models' strategic changes. In the last section are presented conclusions and some suggestions for further scientific research on co-operation and "co-operative identity".

2. "Co-operative identity" – a concept for dynamic and comparative analysis

2.1. The elements of the "co-operative identity" concept

Zwanenberg (1995) presented the author with the idea of examining co-operative aims, principles and co-operatives' needs according to each agriculture sector. This contrasted with those who had sought to identify a general set of co-operative principles (ICA, 1995). This was a starting-point in the author's attempts to develop a new concept of "co-operative identity" (Szabó, 1995, 1997).

The *elements of "co-operative identity"* are: the *definition, aims (purposes) and functions (roles)* of co-operative(s), and also *co-operative principles*, also a major identity component. At first sight this concept seems similar to the new International Co-operative Alliance (ICA) Statement on Co-operative Identity (ICA, 1995), which "...includes a definition of co-operatives, a listing of the movement's key values, and a revised set of principles intended to guide co-operative organizations at the beginning of the twenty-first century" (MacPherson, 1994: p. 8).

However, there are some *important differences between the two concepts*. On the one hand, for the ICA it is necessary to underline the sociological and ideological aspects. All the values and principles, even the terms used (value, movement, guide) to describe the identity represent a kind of *ideological backdrop behind the ICA co-operative concept, which underline the co-operatives' social characteristics* and social aims.

On the other hand, other than definition and principles, *the first concept contains the co-opeative identity's additional elements*, meaning its purposes (aims) and functions (roles). These elements are more relevant toward explaining the economic substance of (agricultural) co-operation. Changes in practical economic life regarding (dairy) co-operatives can be also discussed using these terms.

Secondly, to undertake an analysis of the dynamics of practical co-operative life and development, the co-operatives' *aims (purposes) must be distinguished from the functions (roles)*. With a solid co-operative identity, the initial main "co-operative" aims are largely fixed but, to fulfill their basic taks, the *co-operative functions may alter* over time.

Regarding the ICA statement, only very general aims can be found (including in the definition) and there is nothing written about the functions which are subject to change over time. Therefore, from an economic viewpoint, we have to conclude that the *ICA concept is not a sufficient basis for grasping co-operation substance.*

2.2. Definitions of the co-operative

The theory and legislation on co-operatives contain hundreds of definitions that vary, sometimes fundamentally. The definitions' authors and "fathers" sometimes consider their "child" as a short summary of the co-operative identity. In fact, they are adequate to determine co-operation's substance, particularly from an economic viewpoint. However, it is necessary to define what is meant by the term "co-operative".

In this study, as a starting point, we use the *basic American 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, p.1). The above definition also illustrates the main points of the Dutch and Danish approach.

There are three main links between the member and the co-operative: the product, the capital, and the democratic power structure. The 'economic' co-operative principles (see later) are based on the previously mentioned three main links, as they were formulated based on the elements linking the co-operative's commercial activity with its members.

In comparing the above definition, it is useful to recall the *definition of a co-operative included in the ICA Statement* which stresses the association's basic identity including social and cultural aims: "A co-operative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise." (ICA, 1995).

2.3. Co-operative aims and functions

Circumstances will determine (at least in a working market economy) which objectives arise from an economic environment. Basically two main groups can be distinguished:
1. economic and
2. social aims.

In practice and in the pertinent literature, there are other basic cultural, religious, and political aims, but they are not relevant to our study. To appreciate the co-operative identity from an economic/capitalist environment perspective, crucially important are two groups of aims. As stated above, the co-operative's general economic aim is to *increase its members' income.*

It is vitally important to focus on co-operatives' long-term viability. In order to further its members' interests, real (mainly economic) incentives are essential for establishing co-operatives at the basic level and, through regional organisations (in some cases) organising them into centres. Doing this will provide a counterweight helping the producers-members

against the other players on the chain. Very good examples of "practical" agricultural co-operation are the Dutch and Danish systems which exemplify the need for establishing a viable and flexible co-operative system.

However, the co-operative is a *partial/hybrid form of vertical integration*, meaning farmers have a high degree of economic independence: "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). According to the pertinent literature (Cook, 1995; van Dijk, 1997; van Bekkum and van Dijk, 1997; Meulenberg, 1997; Nilsson, 1997, 1998; Ollila, 1989, 1994; Royer, 1999 etc.) the *main incentives* for establishing *co-operatives as a form of vertical integration* are the following.

First, in the long term co-operatives traditionally *create secure markets and provide access to them*, therefore *protecting independent farmers* against large commercial and/or industrial companies. They can also provide *services that are either unavailable or very expensive*.

Second, co-operatives bolster *countervailing power* and beyond certain economies of scale act as a *competitive yardstick* for non-co-operative, conventional firms (CF). This provides the whole sector with more *influence over markets and prices*.

Third, in some cases co-operatives *increase technological and market efficiency* and undertake activities with a *higher added value*.

Fourth, co-operatives can *decrease and internalise transaction (information) costs*, allowing a better flow of information for consumer demand. This means a closer consumer/farmer relationship creating a unified decision making process between two or more levels in the marketing channel. The co-operative can also *alleviate both economic and technological insecurity*, therefore decreasing transaction costs.

Finally, co-operatives can *augment members' income* by lowering transaction and production costs. This is done by *reimbursing* members with *a surplus members made at another level* of the marketing channel.

Other than economic aims, there are *several non-economic reasons* which are potentially important for the successful development of co-operatives (Hakelius, 1996). First, co-operatives used to be considered as organised trusts, which can determine the success or failure of a given co-operative: "Trust (between the member and co-operative,) is a major co-operative advantage" (Spear, 1999). Second, the social and informal members network (or potential members) is also a significant determining factor in decreasing transaction costs and in establishing and subsequently in running a co-operative. Enhanced knowledge and mutual trust among members (Røkholt, 1999) is vital to efficient management of human relations. In his seminal book, Stryjan (1989) deals with the organisational consequences of different membership and ownership issues, and he also emphasises the human or "soft" approach for organising activities and thus organisations.

As mentioned earlier, in order to grasp and explain the dynamic changes of practical co-operation, the co-operatives' *aims (purposes) must be distinguished from the functions (roles)*. In a clear *co-operative identity*, the initial main *"co-operative" aims* (taking into account that the country, branch, and sector in which they are operating remains unchanged) are largely *fixed*. However, to fulfill their basic task, the co-operative's *functions may alter*

over time. For example, in the past Dutch dairy co-operatives' had price leadership as a function. However, due to changes in the economic and policy environment, it had to assume market leadership to maintain its principal aim of increasing farmers' income.

2.4. Significance and different sets of the co-operative principles

Although the co-operative identity has not only included principles, (co-operative and co-operations definition(s), aims, functions, etc.) for most co-operators the so-called *co-operative principles are the cornerstone for evaluating the co-operative's validity* as the principles prove whether a a co-operative is bona fide or not. 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 for 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 defined co-operative principles

"...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*, and this 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, straight forward 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 – Saxena, 1984: VI)

According to Barton (1989b) there are *four distinctive principle classes* which more or less overlap with 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 all the co-operative principles; details of these four classes can be found in the above cited book (Barton, 1989b: pp. 26-30).

The *Proportionality class and its elements are* the most important, since this class is widely used today widely and its principles for co-operatives agree 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 identical, but differs from the previous as the proportionality basis is not stressed in the first and is absent in the second point.

The performance or proportionality concept means, according to Diepenbeek (1989: p.38), that "...in the distribution of cost and proceeds of the cooperative amongst the members... an economic key is used, namely a distribution according to the economic principle of proportionality – at which the social key of personal need or social claims in redistribution of income is rejected."

The proportionality concept (see Barton, 1989b: p. 31) can be considered a suitable starting point for analysing the co-operative identity and developments currently happening in Europe: for example, Dutch "practical" agricultural co-operation (van Diepenbeek, 1989:38; van Dijk, 1994/1995).

Reflecting recent international changes in economic and social life, the *ICA* had established a working group (Böök, 1989, 1992) to *review the current basic values and principles of co-operation*. The new statement with the new principles was made in Manchester in September 1995 (ICA 1995). The seven principles, which have been basically accepted and implemented in most countries, are the following:
1. Voluntary and Open Membership
2. Democratic Control by Members
3. Members Economic Participation
4. Autonomy and Independence
5. Education, Training and Information
6. Co-operation among Co-operatives
7. Concern for Community

Apart from the co-operative principles, in order to exploit economic (and non-economic) advantages, the *marketing co-operatives use long, medium and short-term contracts* to secure raw materials and to manage the whole marketing chain (Hendrikse – Veerman, 2001a). The *co-operative*, in the modern sense, *is a hybrid formula*, because the common property means the members sign a special "multilateral contract". The statute or bylaw constitute formal legal guarantees that the co-operative will never act against the members and that members will enjoy their advantages and fulfill their duties. The bylaws 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. "The cooperative has, in a way, both markets and hierarchies within the same organisation" (Ollila, 1994:88).

The co-operative's organisational form and decision-making (control) mechanism and the so-called co-operative principles (ICA, 1995; Hakelius, 1996; Røkholt, 1999) can be considered as formal legal bonds (guarantees) of trust between the member and co-operative. Hence the so-called delay problem (Hendrikse – Veerman, 2001b; Karantininis – Nielsen, 2004; Royer 1999; Staatz, 1984) usually is not as significant as in other contractual relations between a farmer and Investment Oriented Firms (IOF).

Beyond the co-operative's economic advantages, there are also some *non-economic* advantages stemming from *member relations and co-operative principles*. A co-operative's major advantages are based on the closer and more informal relationship among the members and between members and co-operative. Røkholt (1999, 2000) indicates 4 types of member loyalty: power based, habit based, tradition based and solidarity based. These constitute

the co-operative's foundation. The co-operative's basic rationale represents a comparative advantage allowing strategies and the exploitation of strengths rather than the elimination of co-operative weaknesses such as transaction cost considerations. Moreover, the personal relationships network among members, which are solidified by co-operative principles, entail important relationships in terms of the co-operative rationale. (Røkholt 1999).

However, in terms of a flexible business strategy, one has to keep in mind that *co-operative principles* coupled with the democratic decision-making process were/are sometimes *obstacles*, especially in acquiring risk capital for activities with higher added value. Moreover, the basic co-operative principle of *1 member – 1 vote* is not always economically sound (e.g. in marketing type of co-operatives). For example, in a dairy co-op, a major milk producer assumes greater risk than a minor one, and the co-op's activity impacts more on a member who is a major milk supplier and on his/her income. Moreover, *limited if any interest is paid* on capital invested in the co-operative (e.g. co-operative shares) and this hinders the *financial position* and potential for undertaking new (marketing) strategies.

For example, *a multiple voting system* could be tied to a proportionality principle, and sensible limitation of votes per member could *help co-operatives* maintain *more regular members and also to gain more capital from members*. A recent feature of *New Generation* co-ops is up-front investments tied to members' projected patronage.

In the following section we are going to analyse the "co-operative identity's" main links between its various elements.

3. Links between the "co-operative identity's" elements.

After analysing the "co-operative identity's" concept and elements, let us examine how these are connected in real life. It is also necessary to emphasise the main "dangers" awaiting co-operatives without a strong and clear identity. In Figure 1 are the central relationships between the elements of the "co-operative identity" and also their relationship with the "mental" and the "real" environment.

In every society there is naturally a broad system of "mental" values, which is the basis for every social action, including economic activity. These types of values can be divided into a number of classes. In Figure 1 are the three major value groups: the economic, the social and the cultural. These are the foundation for a consistent system of social thinking, which is indispensable for initiating economic activity. In Figure 1 the thin black arrow in the upper part represents those values' influence on the basic co-operative AIMS. Naturally, these depend on the importance of each value in a society. If there is a consistent system of values, it is easier to establish basic and durable co-operatives aims. A good example of this is the Dutch and Danish systems of "practical" agricultural co-operation.

Upheaval, such as a change in a political-economic system, can alter the spiritual basis for co-operation. An example of this is the current transformation process in Eastern and Central Europe. Of course if a "co-operative identity" is strong enough, the aims set by the co-operatives can impact on the (economic, social, cultural, etc.) values, but frequently this is minimal (see broken black arrow in Figure 1). Therefore, co-operatives, like any other organisation in economic or social life, are held in society's invisible web representing spirituality, social thinking, and ethics. Moreover, recent world trends of globalisation and internationalisation, occurring particularly in Europe, broaden this spiritual environment.

Figure 1

Elements of the "Co-operative Identity" and their Relation

VALUES (economic, social, cultural)

AIMS	FUNCTIONS	PRINCIPLES	PRACTICE
- economics - social	(roles)	(formal-legal guarantees)	

ENVIRONMENT

- economics
- social-cultural
- political
- technological
- environmental
  protection
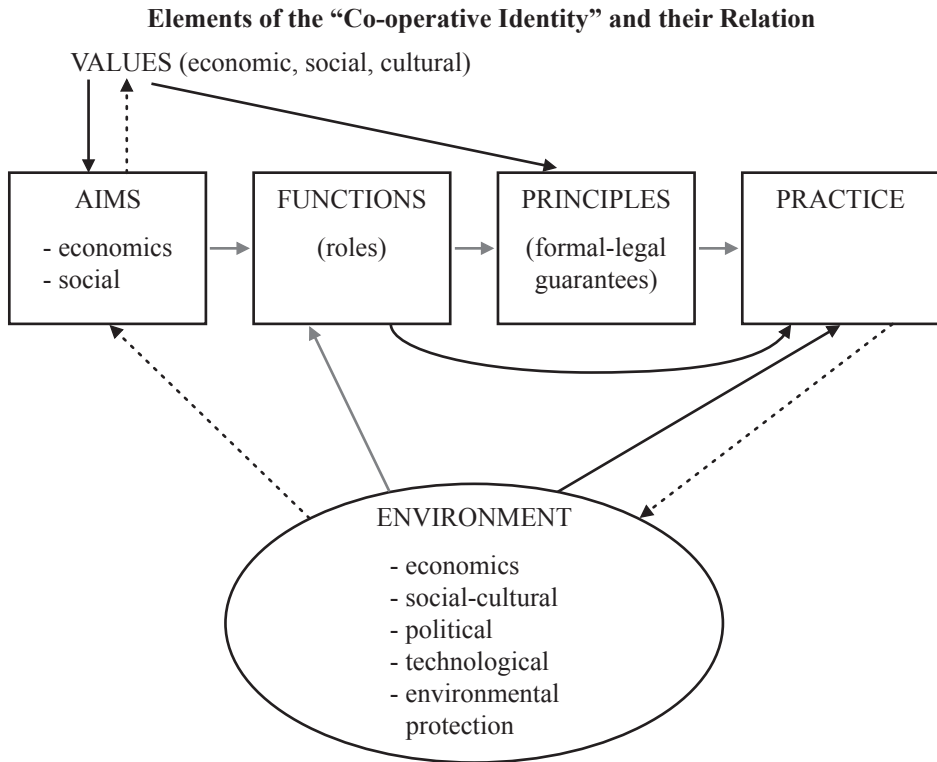
Consequently, in a given society or country, co-operation's aims usually depend on a broad-based system of values. Aims are multi-faceted and all over the world can be set by co-operators. In Figure 1 in the upper right first square are shown the two major basic aims, the economic and the social ones. This constitutes the starting point for our examination process. As stated above, co-operators in every society can define other aims, such as cultural or religious ones, but co-operative activity's central purpose should be economic; otherwise co-operatives couldn't survive without the state. As seen in several countries, if a co-operative has a sound economic and financial basis it can set other aims. However, to remain independent from the state and any other political or economic organisation, it is essential to efficiently organise economic activity. This is particularly true in the case of purely economic co-operatives.

To achieve the main aims members or potential members can define the co-operative's FUNCTIONS (roles) (see the grey arrow in Figure 1). Since research is designed to examine the "co-operative identity" as a useful concept in terms of economic analysis, it is examined in greater depth when co-operatives are purely economic in nature.

In a normal market economy, the economic purpose can remain the same, even in a changing business and social environment. Obviously, the functions can vary according to changes in the economic, social, political and technological ENVIRONMENT. In Figure 1 (see the grey arrow) one can observe the environmental impact on the co-operative's (altering) functions.

"Co-operative identity" functions stipulate that co-operative principles can be formulated as formal legal guarantees. A grey arrow indicates the normal situation connections between functions and the co-operative principles.

As shown in Figure 1, the "PRACTICES square" is located at the end of the examination process. The principle types stipulate that co-operatives shape their own and different business practices. The term "practices" denotes daily operations which are indispensable for completing co-operative activity, foremost with economic activity as a basis. It is necessary to stress that, in a strong co-operation system, endowed with a solid "co-operative identity," the "practices square" is the final "module" toward formulating co-operative activity. In Figure 1. the four grey arrows indicate the normal way of shaping co-operative business.

However, the working environment's effects on co-operative activity are highly signficiant. Figure 1 (see the broken black arrow) shows the weak relationship between the environment's elements and co-operative aims. Naturally, fundamental changes in economic, social, political or technological circumstances can impact on the basic co-operative purposes, but the main line indicates how the various environmental elements can influence co-operative activity through the environment-functions connection (see the grey arrow between them).

It is also true that co-operatives' day-to-day practices impact on some environmental elements, particularly if co-operatives can create a so-termed countervailing power (Galbraith, 1963; NCR, 1993). However, connections of this type are relatively feeble (see the broken black arrow), but in a few "co-opeative countries" there are some exceptions. A common feature of co-operatives with a solid "co-operative identity" is their ability to adapt to new circumstances.

It is also essential to define the "risks" inherent in co-operatives without a solid identity. By thick black arrows Figure 1 indicates three main potential risks. When the previously listed values by-pass the normal way of formulating co-operative activity (as indicated in Figure 1 by the grey arrows), then there is a risk that co-operative principles are established without examining why they constitute indispensable guarantees. This type of misunderstanding is also evident in the new ICA "Statement on the Co-operative Identity" (ICA, 1995). If they neglect practical economic analysis, it leads one to wonder whether it is worth formulating hollow principles. Obviously, it is easy to establish consistent principles based directly on some social, political, cultural values or ethics. But it is doubtful that co-operatives following these principles will remain viable and survive in a fluctuating environment. Therefore it is likely preferable to follow the "grey line" (in Figure 1 see the grey arrows from the "aims square" to the "practices square") on the formulating co-operative activity path. For example, this is indicated in the Dutch agricultural co-operation system.

Another "high risk" by-pass occurs when the "principles module" isn't on the above "grey line" and functions directly shape the co-operatives' day-to-day practices. When this happens, there is no formal-legal guarantee to determine whether an organisation is co-operative or not. Therefore, the co-operative principle or principles are indispensable to determine a co-operative's authenticity. But one must remember that co-operative principles can alter according to each country, sectors, branches, etc. Thus every kind of co-operation forms its own principles. One possibility, after setting an aim or aims and a function or functions, is to accept and use ICA principles. It is also possible that a particular co-operative can actually use only one principle. An example of this is Dutch agricultural

co-operatives that use the proportionality principle. But these formal-legal guarantees are essential for distinguishing the Investment Oriented Firms (IOF) from the "co-operative type of business".

Finally, in this volatile world, it is necessary to analyse the third danger facing co-operatives (in Figure 1 see the thick black arrow from the environment to the "practices square.") Thus there is a context that has absolutely no relationship with "co-operative identity" (concept). It becomes meaningless to describe something as a co-operative when environmental elements, single or multiple, govern and determine the co-operatives' everyday practices. This is because, when by-passing the normal route (in Figure 1 see the grey arrows from the "aims square" to the "practices square"), it is absolutely impossible to develop and salvage a sound co-operative identity. In a volatile environment, "practices" will react regardless of co-operative aims and functions, and principles will not constitute guarantees or may be totally absent. These types of actions present a serious risk for any type of organisation, but are ultimately fatal for co-operatives. In Figure 1 are the three main risks outlined above, and they are indicated by thick black arrows.

In the following section we are going to analyse the traditional marketing co-operative model's limitations.

4. The traditional marketing co-operatives' limitations and emerging new co-operative models

The current agribusiness environment is basically volatile and this prompts us to ask if there are any limitations for co-operatives. We must stress that in a differentiated product markets co-operatives need additional risk capital to compete, and due to their financial structure this is difficult to provide. This fact enlightens us regarding the circumstances where it is better to choose another type of co-ordinating organizational form (governance structure). Recently, there has been a conversion process trend toward conventional firms or other types of producer organisations despite the fact that co-ops can decrease, for example, transaction costs and can also resolve delay problems.

Delays are probably the best known and relevant example in agriculture. A delay: "… arises when one party in contractual relationship seeks to exploit the other party's vulnerability due to relationship-specific assets" (Royer 1999, p. 49). Because of the above mentioned attributes (like asset specificity, uncertainty, etc.) delays are highly significant in the dairy and fruit-vegetable sectors. Therefore, it is extremely problematic (Staatz 1984, van Bekkum-van Dijk 1997; Kyriakopoulos 2000). After buying or building relationship specific assets, marketing co-operative members are not likely to fear that the other party (e.g. the processor or wholesaler) will change its mind and force them to accept lower prices for their products or subsequently terminate the contract.

In seeking an appropriate governance structure, it is more accurate (according to Hendrikse and Veerman 2001b) to specify *two specific challenges regarding delays* in the agricultural production chain: *first, how to prevent post harvest delays* (for perishable products) and *second*, *how to attract outside (risk bearing) investments (funds)*.

EU co-operatives, especially in Holland and Denmark, are good examples of how agricultural co-operation can solve many traditional problems related to to transaction

costs and how they can ajdust to the changing environment. Because of the marketing co-operative's countervailing power aspects, *both these problems can be solved in homogeneous product markets and when the co-op investments are not specific.*

However, *in differentiated product markets, marketing co-operatives cannot provide the necessary investment level* with a high level of asset specificity, such as developing brand names (Hendrikse and Veerman, 2001b). The farmer-member has to make investment decisions. This sometimes entails whether to put money into his farm and/or into the co-operative. The decision to accumulate capital for further vertical integration is offset by the temptation to invest in the farms' assets. Also the co-operative finds it difficult to gather funds from external sources because the membership control principle entails worse terms.

Therefore *the second delay problem can only be solved by switching* (conversion process) from a marketing co-operative to a conventional firm (Hendrikse and Veerman, 2001b), like in Ireland (Harte 1997, Hendrikse – Veerman 2001a,b; Zwanenberg, 1992).

In order to meet the basic co-operative aims and to compete in a market-oriented environment (e.g. more liberal agricultural policies, opening European and world market, etc.) co-operatives will come to execute *new marketing strategies*. To implement such new marketing strategies, they have to collect more risk capital and this is currently precipitating some *fundamental financial and organisational changes* in Western European agricultural co-ops.

Due to increasing organizational costs (Harte, 1997), and given the heterogeneous nature of co-ops, democratic decision-making will become more problematic (Hendrikse and Veerman, 2001b). Closely related to TCE and the (democratic) decision-making process are a number of *potential problems regarding the traditional (countervailing power) co-operative model* (van Bekkum-van Dijk 1997, Nilsson 1998b). This is also true according to the *agency theory* (Nilsson 1998a, Cook 1995,Vitaliano 1983).

The most *important agency problems can be divided into two main groups* (van Bekkum, 2001): *investment related and decision-making process agency problems. In the first group are common property problems* that include external and internal free rider problems. There are also *horizon* and *portfolio* problems, related to members' interest in investing in the co-operative. The *decision-making process agency costs are related to monitoring* and *following up management activities*. If there are opposing interests in the co-op, they are costs related to *influence* building, and these are ultimately linked to management *decision problems* caused by a large and heterogeneous membership with different priorities and opinions.

Cook (1995) employs a co-operative life-cycle model that consists of five stages. In stage three he defines 5 problems. According to Cook (1995), *co-operatives' five inherent organizational problems are: free-rider, horizon problem, portfolio, control and influence cost* problems. These problems are also cited by Cook-Iliopoulos (1998), Royer (1999) and van Bekkum (2001).

Co-operatives have some control over the previously listed organizational weaknesses. According to Cook-Iliopoulos (1998) the co-operative can solve some of these problems *such as control and influence cost problems*. However, changes in European agriculture and contradictions in potential solutions tend to impact on the spread of *new co-operative*

models with alternative financing methods and new organisational structures/strategies (van Bekkum – van Dijk 1997; van Dijk1997; Nilsson1997, 1998b). To keep the basic co-operative character, they are *undertaking internal and external organisational changes*, which – in a number of cases – will create so-called New Generation or Entrepreneurial-type Co-operative Structures/Models.

We may sometimes conclude that agricultural co-operatives have advantages. This is especially true during a market failure problem, especially with some perishable products like fruit, vegetables, and milk, and when the market is not saturated. However, these advantages are not as apparent when the market-mechanism is working well, and transaction cost forms (contracting, monitoring, enforcement) are not high when compared to the internal organization costs. At this point vertical integration (and the co-operative organizational form) is not as advantageous in terms of a marketing strategy (Harte, 1997). Hendrikse and Veerman (2001a) also argue that in differentiated product markets with a high level of asset specificity, a marketing co-operative is probably not the ideal governance structure. They predict governance structures in which *members (farmers) have less decision power*. Likely to emerge are governance structures with better defined property rights, appreciable and transferable equity shares, specific delivery rights (Sykuta-Cook, 2001; Hendrikse – Veerman 2001a) predict *grower associations and participation companies*.

In the new co-op models there are additional contracts between members and the co-operative, forcing internal competition. In fact some of the new co-operative models are acting as market institutions themselves (Cook, 1995; van Dijk, 1997; van Bekkum and van Dijk, 1997; Meulenberg, 1997; Nilsson, 1997, 1998, Ollila, 1989; Royer, 1999). *Nowadays the conversion process poses a major challenge for co-operatives and probably more practical types of the new model(s) will emerge*. However, in this regard recent empirical evidence is sparse, and various studies reported controversial experimental evidence on the viability of co-operatives in modern agriculture. This will remain true until the products/services line is more important than the capital line (with appropriate principles to cement this), and until this happens an organsation will function as a co-operative whatever its legal strucutre. However, to analyse co-operative development dynamics and to grasp the substance of co-operation, *"co-operative identity"* might be a *useful concept/starting point. This is especially true if comparative research* can be implemented.

5. Conclusions: necessary extended interdisciplinary research activities on the substance of co-operation

Current economic co-operative theories alone are insufficient to define all aspects of co-operation's substance and advantages (Røkholt, 1999, 2000). Therefore, it is necessary to *propose new, interdisciplinary research* (including a comprehensive theoretical overview) on *co-operation's* substance and emphasise *the importance of gathering insights across the social sciences*, using the results and common findingsof economics, law, marketing, financing, organisational studies, management sciences ("hard" sciences), and also some elements of philosophy, psychology, sociology etc. ("soft" disciplines). This would be based on a positive (economic-analytical) scientific approach. It would differ from the ideological normative approach toward co-operatives, since it would preserve its *scientific character* and *neutrality, untainted by political and social designs*. In accordance with the ideas outlined in this paper it would be important and useful to extend research activities and to carry

out *comparative research on the co-operative identity*. In order to economically analyse co-operation, *this would be done according to each country and different branches and sectors of the economy*. Moreover, this paper can be regarded as a preliminary study toward further research. Regarding this paper's subject matter, the author would be grateful for any comments and/or suggestions, including ones for future collaboration!

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Leadership and the importance of social capital in the transition of cooperatives[1]

A Case study of two cooperatives

Csaba Forgács[2]

Abstract

In Hungary radical reforms have meant that an increasing number of cooperatives have either fragmented or gone bankrupt because of not being competitive under current market conditions. Others, however, have been able to maintain or even improve on their previous success. Individual farmers have also established new cooperatives and are trying to further cooperation.

This paper discusses the importance of cooperatives' management during the transition period, a topic which the pertinent literature does not fully address. Production co-ops were not only economic units but also social networks. Two successful cooperatives from the same town, one old and one new, have been used and comparisons drawn regarding their management and progress, both of which were backed by social capital. The findings show that, in the traditional agricultural co-op, a more social- (member) oriented leadership has helped to overcome economic, social, and psychological barriers erected during transition. With the new co-op, the post-reform period has prompted enhanced cooperation mainly dependent on a increased level of social capital.

Key words

Social capital, transformation of coops, leadership and management, production co-operatives

1. Introction and problem statement

Most Central/East European countries (CEECs) had a system of large-scale farms which, to join a market system, had to be restructured. Prior to radical reforms in Hungary, agricultural co-ops had a 48-50% share in Gross Agricultural Output (GAO) while another 33-35% came from household production integrated with co-ops. After Communism, cooperative members needed to choose between continuing cooperative farming or leaving the co-op to start farming individually or establishing partnerships. Two major types of cooperation, a traditional production co-op and a new marketing coop, will be evaluated.

At the start of the 90s, not many co-ops within the agricultural sub-sector were broken up, but in the following years this became more frequent. In fact, in the early nineties 7-10 % of co-op members decided to leave. The new individual farmers' average size holdings amounted to 2-3 ha. However, later on some of them decided to join recently established cooperatives.

The case study is based on research in literature and interviews. Field work was carried out in a traditional cooperative, BÉKE, and in a newly-established Purchasing and Marketing Cooperative, HAJDÚ GAZDÁK (PMCHG).

The research provides insight into private farmers' motivations as well as those of co-op members and highlights those factors driving private farmers, on the one hand to join cooperatives and, on the other, factors driving traditional co-op members to stay put.

Besides the PMCHG and BÉKE Co-op directors, also interviewed was another key PMCHG individual. Moreover, based on a standardized questionnaire, five members from each co-op were asked to answer questions. To complete the case study relevant documents and observations were also used.

The paper is structured in the following way. In the second part, the case study's objective and subsequent hypotheses will be described. In the third section, an insight will be given into the establishment and performance of both co-ops. The fourth section deals with methodology and the analytical framework, including the role of management in cooperation. In the next section the focus will be on visually presenting the actors and their interactions. Section six discusses how people have tried to improve social capital under different institutional circumstances. Finally, there will be a summary of the findings on social capital in the two co-ops.

2. Case study objectives and hypotheses

The case study's obejective is to compare the development of a traditional and a new type of cooperative in the post-reform period and to highlight key factors affecting cooperation.

2.1. Radical reforms

In the early 90s the political changes which took place greatly changed farming's political and economic environment. The new agricultural policy's major pillars were the following: "a) the country must have internationally competitive agriculture, b) subsidies should be reduced to a much lower level. c) as in the EU, the family farm must be supported to becoming the prevailing structure." [3]

Only for land could one, retroactive to 1949, reclaim *in kind* individually owned property. Due to the four compensation laws[4], approximately an additional 1.0-1.1 million landowners, with an average of 1.7-1.8 hectares, emerged. This was coupled with the the already 1.5 million landowners, resulting in fragmented land ownership (Varga, 2000).

2.2. New institutional framework for marketing products

Concerning institutions, the fact that the former regime ceased helping small farmers access markets created the following problems: a) local markets used to exist that accepted limited supply; b) however, the efficient General Consumer and Marketing Cooperatives (GCMCs) mostly disappeared; c) inexperienced new middlemen emerged and began business in the vertical chains; d) production co-ops no longer felt compelled to market small indivi-

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[3]   New Agricultural Policy. Ministry of Agriculture. Manuscript. 1992.
[4]   The Parliament passed a law on partial restitution (XXVth Law (1991)) covering all kinds of assets destroyed, partially destroyed, or taken over by the state. This law was followed by four others (XXIVth Law of 1992, XXXIInd Law of 1992, IInd Law of 1994 and XXXIIIrd Law of 1997) all dealing with compensation. People whose ownership was damaged by the laws released after May 1, 1939 and listed in the annex and ownership damaged by the laws released after June 8th, 1948 and listed in the annex of the law (XXVth Law (1991)) had to be compensated. The amount of the compensation was determined on a regressive scale.

dual farmers' products; e) former procurement and processing companies were no longer obliged to purchase agricultural products; f) in this context social capital was destroyed before the emergence of a new competitive distribution system; g) establishing a new system from botom to top needed more time and resources.

Under the Ministry of Agriculture and Rural Development, there have been several new institutions dealing with establishing a new environment for coordinating market performance. These are: a) Office of Agricultural Market Regime, b) Center for Agricultural Intervention, later named Office of Agriculture and Rural Development (paying institution), c) Product Councils (PCs) established by producers, processors, traders and consumers of selected products or groups of products, d) Producers' Organizations (POs).

Moreover, some other institutions have also represented the interests of agricultural producers, e.g. the Agricultural Chamber, the National Federation of Agricultural Producers and Co-operators (NFAPC), and the National Federation of Farmers (NFF).

2.3. Transformation of production co-ops

In 1992 a law was passed on how cooperatives could meet new requirements, allowing members to leave their cooperatives if they wanted. In restructured co-ops three major landowner groups have appeared. First, there are people actually involved in agricultural production. Second, retired people who remain co-op members. Third, 'outsiders', meaning recent landowners not interested in private farming. Besides the land itself, means of production (machines, other tools, etc.) have also had to be distributed among landowners in the form of co-op shares and business shares. Pensioners now control an increasing number of business shares, resulting in conflicts of interest. Success in restructuring agricultural co-ops and in developing new co-ops has very much depended on their managers expertise and also on how much members trust those very leaders and the institutions.

3. Methodology and analytical framework

Recently researchers have indicated that social capital is a key element of economic growth and that it is linked to the prevailing level of trust. However, the level of "social capital depends on a person's connections (whom they know, but also connections through common group membership), the strength of these connections and resources to their connections" (Murray and Beckmann, 2004). In the given socio-economic contenxt, the latter prompts discussion and evaluation of the social capital issue and its strength. The IDARI Project WP3 dealt with social capital, governance, and institutional innovations by analyzing processes for achieving cooperation and by seeking to understand the failure of cooperative strategies. To understand the concept of trust, case studies focus on communication and social learning. Murray (2004) underlined that the extent of relationship networks is determined by a group's prevailing social norms, the necessity for interaction, and individuals' motivations for interacting.

3.1. Social capital under the socialist system

Chloupkova et al. (2003) have compared social capital development in Danish and Polish cooperatives and concluded that, although pre-World War II levels were similar, the present Danish social capital level was now higher. This suggests that under the Communist

regime Polish social capital was destroyed. However, regarding former socialist countries, one has to be careful when making general statements on the social capital situation. First, socialist countries had strong national characteristics. Second, in contrast to other former Communist countries, during Polish socialism small farms dominated agriculture. Third, Polish small farmers have accumulated sufficient experience when it comes to trusting each other, other market players, and the government.

In Hungary private farming had a marginal GAO role after collectivization (1961), but small-scale (household) farming was an important source of income for cooperative members. Cooperative members' trust in their leaders also increased. Vertical cooperation between producers, buyers, manufacturers and traders grew and transaction costs declined.

3.2. The decline of social capital after radical reforms

Agrarian reform in CEE countries (CEEs) has been examined in terms of political economy, property rights theory, transaction cost economics, etc. Valentinov (2004) asserts that in all these approaches social capital has played a decisive role toward the outcome of reform. Each approach was shown to reveal specific aspects of the social capital concept, which subsequently led to additional findings. In CEECS it is undeniable that social capital plummeted after radical reforms. The question is why.

First, land ownership has changed substantially. New landowners have different attitudes toward farming and also a low level of social capital. Second, people have not been sure how stable the new agricultural policy is. Third, prior to political change, cohesion and the social capital level among cooperative members were often high. This was due to long-term successful performance. For many Hungarian cooperatives, trust in management has become a decisive factor. Fourth, social capital, social norms, and levels of trust were greatly affected by radical reforms. Fifth, for years the economic environment has not been transparent. Numerous people and businesses have broken rules and the value of norms has declined.

3.3. The leadership issue

After the introduction of the 1990 new agricultural policy, co-ops had a hard time adjusting. A decisive question became the extent of people's trust in the cooperative as such and in its managers. In Hungary only 127 out of 1,441 cooperatives were not able to meet the deadline for new legal requirements and consequently disappeared. Some 10% of members decided to leave their cooperatives, but the rest continued their membership. The vast majority of members did not think of leaving the cooperative to begin farming on their own. This helped prove that people highly trusted their cooperative management and their cooperative.

Why have certain cooperatives survived? A major factor in their adjustment was the co-op management and that members trusted their management. Murray (2004) stresses that managers and management may have a decisive role in improving and maintaining a high level of social capital. Economic arguments alone cannot explain relationships between co-op management and members. For most co-op managers suddenly ceasing a long-term pattern of helping and mutual support would have been highly unlikely. Findings from both the experimental study and the cross-sectional survey by Cremer and Knippenberg (2005) showed that a manager's self-sacrifice has a positive effect on cooperation. Trust in the manager and

feelings of collective identification bolstered the effects of this self-sacrifice. While focusing on different facets of management in social dilemmas, Vught (2002) concluded that the effectiveness of a manager's solutions to social dilemmas depends on a balance between a manager's characteristics and members' expectations.

3.4. Research hypotheses

The following research hypotheses were formulated and tested:

Hypothesis 1: Where trust in formal institutions is low, there are high transaction costs in dealing with the State and actors will rely on informal institutions to solve their problems of collective action.

Hypothesis 2: The more frequent and complete communication is between agents, the greater the cooperation.

Hypothesis 3: Reducing transaction costs generates changes in governance structure.

Hypothesis 4: Prior to reforms, social capital in CEE countries was low.

Hypothesis 5: Although the market is based on competitive forces, a network of cooperation is nevertheless required for its sustenance.

4.   Unit of analysis

In this section, the historical development of two cooperatives will be discussed. It will be shown how social capital, following the collapse of the old distribution system, has contributed to improving or maintaining cooperation.

4.1. A brief history of and the challenges facing the BÉKE Co-op, Hajdúböszörmény

On June 27, 1955 the poorest of the town's peasants founded The BÉKE Co-op. Those very founders had a total of 73 ha of agricultural land. However, in 1960 both the number of co-op members and the area under cultivation increased significantly (Mónus, 1999). Specialists came and worked for the co-op and over the years huge investments were made. Since 1967, farms tried to be profitable. In 1978 because of greater production, BÉKE's Co-op corporate governance was changed. In the following years, the co-op often won the "Cooperative Excellence" award.

During the transition to a market system, many agricultural cooperatives broke up and disappeared. In 1990, after 27 years at the helm, the BÉKE president was replaced. The new management opted for a more aggressive style, and, as permitted by law, distributed part of the land and assets among members and employees. At the same time, the president held face-to-face negotiations with all members. Finally, 64 out of 960 members (some 7%, below the national average) left the cooperative.

Over the years, BÉKE has carried out a 100% leverage buy-out of the Zelemér agricultural co-op. Moreover, a turkey plant has been bought and two more beef and a pig production unit have also come under BÉKE ownership. Finally, in 2000 the co-op merged with the Agro-Balmaz Agricultural Coop. Now nearly 600 people work for the co-op in 26

different units. They interact with more than 100 entrepreneurs and cultivation covers a land area of 7,000 ha owned by 4,000 landowners.

Although over the years the co-op has faced real challenges, it has still managed to achieve significant economic growth and results. The cooperative has followed an expansive development policy and new investments enhanced its stability but these have not always been tested by market needs and have required more and more loans.

In the late 90s some 50% of business shares in the cooperative were bought by the government. However, under a December, 2005 law on cooperatives, the shares will be given back to cooperatives, but these can be used only under joint ownership conditions.

4.2. The establishment and development of the Hajdú Gazdák Purchasing and Marketing Cooperative (PMCHG)

In the early twentieth century, the Hajdú Gazdák Agricultural Association was established but was later suspended under the Communist regime. After 1990, individual farmers wished to revive this association. First, in 1993 the Farmers' Club was established with the aim of "representing the interests of the members, improving the skills of producers, increasing both the output and the quality of production…" (Mónus, 1999). In July, 1996, the Farmers' Club was succeeded by the HAJDÚ Purchasing and Marketing Cooperative (PMCH). Its purpose was gathering and spreading information, joint purchasing of inputs, and marketing of products. To access additional government support, in 1999 PMCH decided to establish a new producers' organization (PO) called the Purchasing and Marketing Cooperative "HAJDÚ GAZDÁK" (PMCHG). Justification for this action was underlined by Murray (2004) who stated: "Cooperation between people requires networks of association, and can be distinguished as situations where there is visible action on a collective level for a predetermined goal or social dilemma". Shortly after the establishment of PMCHG, the new and old cooperative, with the same members, merged under the name PMCHG.

The cooperative is managed by the Board of Directors consisting of five members, and is supervised by a board of three members. The Members' Council meeting is the top-level decision-making body, with one member one vote. Payment for departing members is based on an equity ratio, and new members have to pay the same amount that departing members take out.

5. Visual presentations of actors and their interactions

This section deals with players from both case studies at the beginning of transition period. The width of arrows in Figures 1 and 2 reflect the weight of a given link.

5.1. The BÉKE Cooperative – a traditional production cooperative

The laws on compensation, on (new) cooperatives, and on the transformation of traditional agricultural cooperatives created a new legal environment. According to the law, cooperatives' equity (animals, machines, buildings, etc.) now had to be distributed among their members.

In 1990, a new president (director) was elected. The former and new president trusted each other and this trust also extended to most of the members. Therefore, internal factors contributing to social capital abounded and members did not wish to break up the cooperative community that they had taken years to build. However, others mainly saw the potential of individual farming and failed to see its disadvantages. Figure 1 shows the relations and interactions between BÉKE actors prior to deciding to transform the cooperative. In the end only 7-8% of members left.

5.2. The Purchasing and Marketing Cooperative "HAJDÚ GAZDÁK" (PMCHG)

In the early nineties government policy encouraged family farming. Those who left cooperatives were sure they would be more successful as individual farmers. For them, some individual farmers in the region were regarded as successful pioneers. Their level of social capital was not high when it came to co-ops and co-op managers.

After undergoing radical reforms, BÉKE cooperative enjoyed stable economic growth. Members were satisfied with the level of income from co-op activities. These activities enabled people to attain an acceptable standard of living for their families. Relations between members and also between members and management were based on trust. People recognized the need to enhance co-op performance and considered this management's responsibility. The fact that members had long known and respected their co-op's management team meant they were willing to follow them. Management decisions regarding investments and changing product structure were accepted by rank and file members. In Figure 1 are personal linkages within BEKE co-op.

Figure 1

**Actors and their interactions in the BÉKE Cooperative
before decisions on future development**
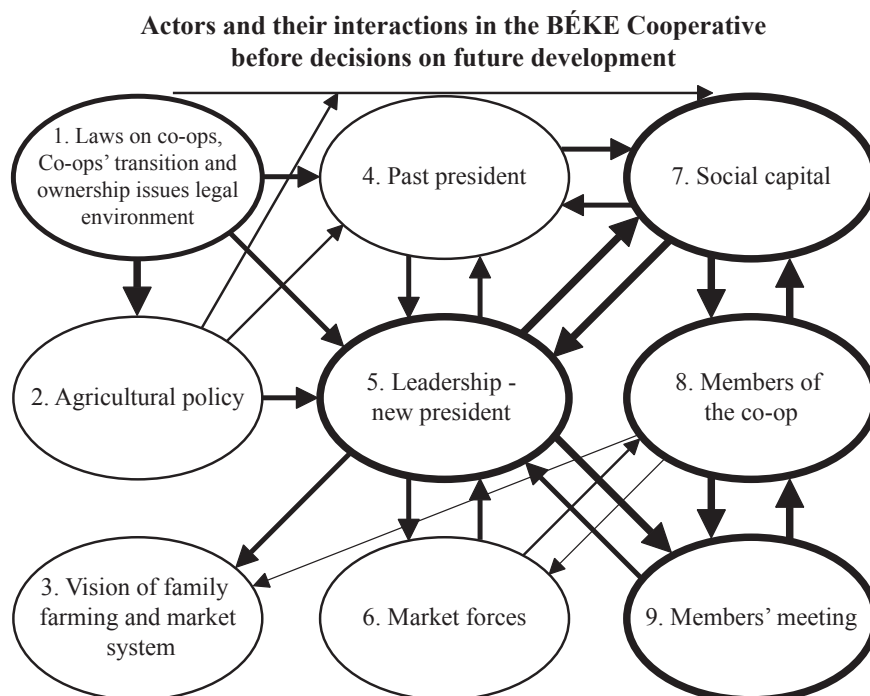
In the PMCHG co-op the first step towards cooperation was in 1993 when, individuals established the Farmers' Club. Key players were able to strongly influence conditions for the further development of cooperation. The PMCHG management assumed only necessary administrative jobs but did not exercise as much clout as the BÉKE president did. Social capital among members was above average. Internally this was partially because the founders had sufficient experience in family farming while former cooperative members were well-informed about agricultural policy issues. Concerning external factors, people strongly trusted the new government and the institutional environment.

In Figure 2 Linkages and interaction between different PMCHG actors.

Figure 2

**Actors and interaction between individual farmers
before joining the Farmers' Club**
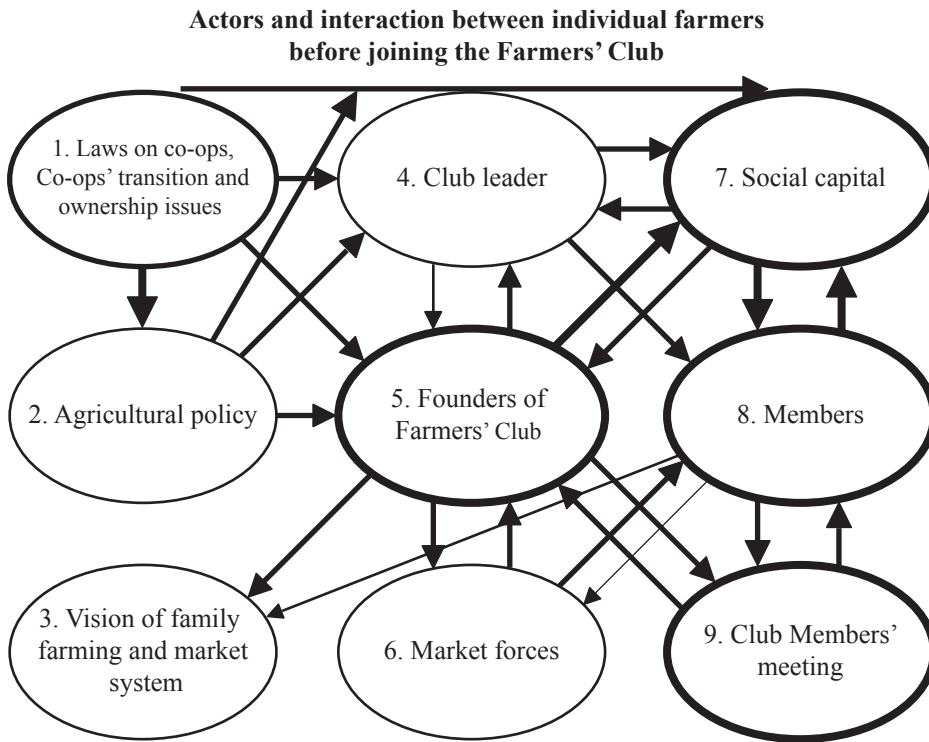
5.3. A brief comparison between the BÉKE Cooperative and the Farmers' Club.

At the beginning of the nineties, social capital in general was somewhat stronger among BÉKE members than in the Farmers' Club. This was due to the BÉKE's history of collective achievement. However, in some areas the picture was the opposite. The previous BÉKE president was highly trusted by the membership. Between management and members there had been a positive atmosphere, and the legal environment had been transparent and stable. In 1990 after the election of the new president members continued to trust the management. However, following radical reforms, trust diminished toward state institutions, and in the prevailing legal environment, and in agricultural policy. This was because the then government favoured family farms over cooperatives.

In the early cooperative stages, The Farmers' Club focused only on information sharing information. However, later members recognized the need to make joint purchasing inputs to reduce transaction costs and then later the need for joint marketing. At the end of the nineties the need for joint investment was recognised and agreed on.

6. Determinants, effects and processes of cooperation and rural institutional innovation

In this section, analysis will be conducted on a parallel evaluation of interviews. There will also be analysis on five interviews from each co-op and with the two managing directors.

6.1. The role of trust/mistrust and opportunism

Social capital, trust, and cooperation entail people exploring collective cooperation in a smaller or larger community in order to benefit from such cooperation.

Eight out of ten interviewees said they were not formal members of any local or regional group or association. One person from BÉKE was a member of the regional federation of cooperatives and one worked for local government.

PMCHG members emphasized the economic advantages of joining a co-op because of decreasing transaction costs. "From an economic viewpoint, social capital recognizes *value* in social relationships, which can have market benefits, and as such should be considered akin to physical capital" (Glaeser *et al*, 2002 after Murray, 2004). Long-term personal relationships were an important factor but it was less significant than for the BÉKE Cooperative. Among the benefits arising from trust members stressed the following: that people were helpful, that trust is the basis of common interests, that mutual trust is the greatest of all treasures, and that the benefits depend on the people themselves. Members of PMCHG said that problems raised by the group should largely be solved by the cooperative rather than by national or local government agencies.

BÉKE Cooperative members found it pertinent to mention that their parents were also members and that three of them had already been cooperative employees. Two respondents considered the town and the neighborhood as their community while another considered the family and work mates as community. For another the entire county was important. Most of them had joined the cooperative many years previously. According to them, cooperation and integration had brought members advantages. Others who joined later had been attracted by the cooperative's reputation. Although they were more cautious or more critical of the notion of trust, BÉKE members had greater trust in EU institutions and in both national and local government officials. They also found mutual trust advantageous but stronger emphasis was placed on more efficient work and a good working atmosphere. BÉKE members were more cautious, admitting that conflicts could surface everywhere, although it is not typical in a co-op. Economic problems should be solved by the national government, but the co-op must also do its best to solve problems. Compared to PMCHG members, BÉKE members were more informed on farming's historical aspects and had information that was based on a deeper analysis of economic issues.

In the two cases, reasons given for joining the cooperative were rather different. In both co-ops, interviewees stressed the importance of long-lasting personal relationships among members. Discussing trust in more general terms, members of PCMHG enjoyed higher levels of trust with their business partners and this even without written contracts. Their levels of trust had changed based on experience gained over the years. Because of post-1990 experiences, BÉKE members were more pessimistic.

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 placed more trust in the national government and their trust in EU institutions was also above average. However, where trust levels in state institutions were low, to reduce trans-action costs people looked for informal institutions to solve their problems. Hypothesis 1 was justified**.**

6.2. The role of communication and learning

Based on information from different communication channels, people in communities always change their views on various issues. How intensively these channels are used affects the level of social capital.

Concerning *government and EU issues,* neither group used the following: local markets and shops, government agencies, political parties, and internet communication channels.

PMCHG members tried to gather information through more channels and used them more frequently, while BÉKE members mostly relied on national media but less on local community leaders. Information from cooperative leaders was checked by obtaining and analyzing information from various governmental and other sources of information.

In both groups collecting information on *community issues* was conducted differently. The frequency with which information was gathered was significantly lower in the BÉKE co-op. All PCMHG members got information principally from community leaders as well as from community and local newspapers.

A key point was how much people *were satisfied with the information* they had. The Ostrom approach states (after Murray, 2004) that during the communication process social capital is enhanced or eroded through the establishment of trust, reputation and reciprocity. In both co-ops we can see a positive outcome as the general picture was excellent. PMCHG members found decisions on investments to be a communication weak point. Blockage or withholding of information within the cooperative was not considered a serious problem.

The high level of satisfaction with the essential information supply was likely due to continual discussion among members on important business issues. The dialogue is quite intensive and new information is shared as soon as possible. PMCHG members were more optimistic concerning members' capacity for problem-solving.

Regarding *external contacts* with relevant people from similar organizations, members in both cooperatives thought that such tasks were mostly management's responsibility. However, in either case external relationships are not that significant.

People stated that, no matter how long one has worked for the cooperative, one always gains something from it. Members from the younger cooperative placed high value on joint efforts and collective action while members of BÉKE valued being well-informed.

All ten interviewees said they were satisfied with the information they had been provided. When not, then additional efforts had managed to acquire the missing information.

In both cases, people have used to varying degrees different channels to obtain sufficient information. Central actors have not used communication to their personal advantage, but as a means of helping members. Hypothesis 2 was justified.

6.3. Transaction costs and governance structure

PMCHG members most valued those incentives (economy, environmental protection) which most affected transaction costs and, to reduce transaction costs, they were willing and open to cooperation with non-members. To reduce transaction costs, BÉKE members valued the historical background of relationships and education.

Most of the interviewees had not calculated the costs of attending internal meetings but more of them calculated costs related to attending external meetings. Membership was seen as a benefit, especially in the PMCHG Cooperative. The benefits they indicated included market access, the reduction of input costs, joint use of machinery, and getting farm gate prices based on quality. BÉKE members listed those long-term benefits which they were at risk of losing.

To improve efficiency and enhance cooperation, in the late seventies BÉKE changed its governance structure.

In 1996 and in 1999 the PMCHG changed its governance structure. This was done to reduce transaction costs or to become eligible for additional resources and to improve cooperation.

It was shown that cooperatives, in order to reduce transaction costs, have decided to change governance structure and have adjusted to new economic conditions and market situations. Hypothesis 3 was justified**.**

6.4. The role of the state and cooperation's formal institutional environment

During the socialist era, members of both cooperatives agreed that cooperatives had been efficient and economically sound. Other than the introduction in 1967 of a new economic mechanism, there were two more factors which improved cooperation.

First*,* cooperatives were allowed to engage in so-called non-agricultural activities (construction work, producing spare parts, etc.) which were more lucrative than animal husbandry or crop production. Utilising subsidization policy, they developed farm infrastructure, bought the latest technology and new machines, made profits, and paid more money to members and employees. Second*,* cooperatives could perform the latter because farm gate prices were gradually approaching market prices. In the first half of the seventies, agriculture grew quickly and in the second half still grew at a reasonable level, but later growth slackened. An experiment showed that if cooperatives were more independent, they would be able to increase efficiency and generate more profits.

Since radical reforms, people's attitude towards cooperation has changed significantly. Mainstream views have become more negative, making people less likely to engage in cooperative activity. Land compensation was not well-managed. People have become less trusting and members were cautious when asked about enlarging cooperative measures.

The majority of responses indicated that trust towards central and local government has deteriorated. This decline is more pronounced among PMCHG members and only one person out of ten responded that trust in government had increased since the transition. They also stated that the declining level of trust was caused by the current government.

Members of the BÉKE Cooperative were mostly dissatisfied with government performance while PMCHG members were more positive. In general, people were disappointed with agricultural policy toward EU membership.

After the introduction of the new agricultural economic mechanism in 1967, social capital started to increase and developed as the economic environment became a mixture of a centrally- planned and a market economy. In Hungary during the seventies and eighties social capital was not low. Hypotheses 4 was rejected.

6.5. The role of communities, social networks and informal institutions

Motivation toward helping the community has been strong in both cooperatives, even if only other members of the local community could benefit from it. Cooperative members' general attitude has been highly community-oriented. People feel motivated to help if it only involved donating their time. However, if money was required, fewer people were ready to contribute. All PMCHG members interviewed were willing to sacrifice more and were even willing to pay more money toward community development. BÉKE members were also in favor of improving cooperation but they expected to get direct benefits if a financial contribution were required.

The majority of PMCHG members mentioned that conflicts should be openly discussed and that for major issues the cooperative's by-laws must be used. BÉKE members said that both formal and informal mechanisms could be used to find solutions. When dealing with a problem, people in both cooperatives would take action to clarify it with the initiator (BÉKE) or address it to the cooperative leader or hold a group meeting (PMCHG).

PMCHG people did not perceive that their group contained a clique. However, in the case of BÉKE, two members mentioned that such cliques existed.

Cooperation is affected by several factors. All examined factors (8) were deemed to be very important or somewhat important in both cooperatives, but on average the BÉKE membership more strongly supported this notion. All nine members who responded stressed the importance of keeping well-informed, and the foremost factor was having sufficient information to make prudent decisions. Moreover, they also stressed the importance of a high level of trust and market-driven incentives for cooperation.

It can be stated that informal institutions were not seen as a necessary determinant for achieving cooperation. People could efficiently make use of formal institutions and only rarely tried to find solutions by informal means.

6.6. The role of market and competition in fostering/hindering cooperation

PMCHG members took a practical approach, asserting that agriculture is sustainable as long as it is profitable. Most BÉKE interviewees also thought agriculture could not be sustainable if it was not profitable. They indicated that sustainability largely depends on available sectoral subsidies. As for environmentally-friendly agriculture, people pointed to different aspects, but organic farming was the leading one.

The cooperative's competitiveness was evaluated at different levels. For the PMCHG, one member found the cooperative competitive, two thought the coop was moderately competitive, and two people declined to answer. Those from the BÉKE Cooperative asserted that logically the cooperative must be competitive because it has been operating for 50 years. However, they added that currently neither the cooperative's foreign nor its domestic market could be considered stable. Tourism was not deemed a solution for regional or local problems.

Hypotheses 5 was justified *as people found market forces important and underlined the need for cooperation to become competitive and to meet market requirements.*

7. Conclusions

Since the passing of socialism and the introduction of radical reforms, people in both cooperatives have had different experiences and have followed different paths to development.

Utilising experience gained in private farming, PMCHG Cooperative members increased cooperation to reduce transaction costs. BÉKE Co-op members from the mid-sixties to the late eighties achieved progress; they strongly believed in cooperation and deeply trusted their management team, a trust which had survived the test of time.

For both co-ops, a high level of trust resulted in an effective way of reducing transaction costs, even when trust was based only on personal or one's parents' experience. The latter was a stronger factor for BÉKE Co-op members and indicates that co-op members held high levels of social capital under the socialist system.

In the two cooperatives the role of leadership differed somewhat. In the BÉKE Co-op, 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.

Based on different experience, trust towards formal institutions differs in the two co-ops. It was ascertained that the level of communication affects the level of cooperation. In neither co-op has the the latter been handicapped by a shortage of information and the chief players have not used communication as a source of power. Both co-ops wished to reduce transaction costs and thus undertook changes in governance structures.

People were able to solve some of their problems by relying on formal institutions. However, when this failed to work, they used informal institutions. From the very outset, PMCHG Cooperative members viewed informal methods as playing a more important role

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An empirical research of the factors determining customer behaviour in food retail stores

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Abstract

For years the **Institute of Marketing at Szent István University** has been conducting research in customer and consumer behaviour. This research project focuses on which food shops retail customers choose when it comes to traditional food[4]. This paper briefly summarizes qualitative findings and offers a preliminary analysis of the project's quantitative stage.

Using six focus groups, the **qualitative phase** tried to identify factors that impact on how food retail shops were chosen. The goal was to pinpoint individual steps in the decision-making process. Shops selected for study were: hypermarkets, supermarkets, discount stores, small shops, markets, specialised stores and cash & carry stores. Following this, using data from the qualitative results, a **national representative survey** was conducted. The survey used a standardised questionnaire with **1,019 subjects**. The survey concentrated on hypermarket customers, as well as identifying this customer group's segments, and analysing their decision-making traits.

Keywords

Kelly's repertory grid technique, Qualitative research, Quantitative research, Monroe & Guiltinan's store choice model, Donovan & Rossiter's store atmosphere model, store characteristics, segments of hypermarket patrons.

1. Theoretical background

Previous studies conclude that food retail stores' market strategies are largely determined by suppliers, competitors, and consumer decisions. Marketing-riented approaches emphasise the significance of consumer needs, i.e., their preferences and the factors behind their choices. Because of the current need to adapt to the market, and the emphasis on profits, customer choices are increasingly considered. Consumer and customer behaviour theories contend that choices are primarily made about products, and retail patronage entails only a minor factor in the consumer's choices. (Kotler, 1998).

Amstutz's (1967) customer decision flow diagram underlines the significance of decision-making in patronage, as this model regards the purchase process as a composite of product, brand, and channel of communication choices combined with price acceptance. Another model based on a close relationship between the purchase process and retail patronage choice was outlined by **Hawkins, Best & Coney** (1986). Hawkins, Best and Coney's model was based on the customer decision-making process established by **Engel, Kollat & Blackwell** (1978). The former model points out that the problem identification phase, plus the search for information and evaluation of alternatives, is followed by decision-

making. However, this decision-making includes not only product choice, but also purchase point choice. Later comes a post-purchase comprehensive evaluation.

Heinemann's (1974) model retail store choice also describes five distinct steps, but differs by analysing the decision-making process through the retail patronage decision. The steps are the following: identifying purchase reasons, searching for alternatives, evaluating alternatives, selecting a given retailer, choice evaluation.

Based on the evaluation criteria and phase, **Engel, Blackwell & Miniard's** (1987) model differs when researching customers' decision-making processes. The two main aspects are general criteria (location, distance, choice of products, price, advertising and promotion, staff, services) and perceived store characteristics (image evaluated by customers and judged either acceptable or unacceptable as a composite of all the factors considered).

However, **Tietz** (1993) and **Arend-Fuchs** (1995) consider retail patronage choice as a three-dimensional decision-making process. The customer evaluates and selects products (brands) and retail unit types, and then finishes at the optimal purchase point. Here choice of product, store type, and of purchase point are related to the customer's qualitative and quantitative characteristics. Quantitative characteristics include demographic and social factors as well as reference group choices, whereas qualitative characteristics encompass attitudes, lifestyle, purchase habits and patterns.

According to **Olach** (1999), the criteria for decision-making can be modelled mathematically, using the following formula:

$$\frac{4T + 3S + 1R + 4V}{4}$$

T stands for distance from home, work or usual place for leaving public transport;
S stands for choice and quality of products;
R stands for a system of reference points;
V stands for staff behaviour and attitude.

Related research for the Hungarian context was done by **Kenesei** (2002) and focuses on customer loyalty in the decision-making process; **Törőcsik (**1995) also provides a theoretical taxonomy for retailers.

The current research project is based on the most comprehensive retail patronage theory, a model by **Monroe and Guiltinan** (1975), which **Assael** (1984, 92) presented in a simplified form and which was later adapted to the Hungarian setting by **Hofmeister-Tóth and Törőcsik** (1996). The model considers several steps in the decision-making process. Initially, household characteristics (demographic data, location, role, lifestyle, personality, economic situation) determine purchase needs, and are placed beside purchase habits. During the decision-making process, the customer perceives information about retail store types and characteristics, of which a large proportion remains sub-conscious. Perceived store characteristics, complemented by perceived retail strategies, are filtered through attitudes, forming a comprehensive image for a particular store. A decision is made, further informa-tion is collected within the selected shop, and necessary products are purchased within the household budget. According to the model's circular nature, previous experience shapes the customer's purchase behaviour, habits and attitudes, and influence future decisions.

Besides the above model, **Donovan and Rossiter**'s (1982) store atmosphere model provides the theoretical bases for the current study. Store atmosphere is defined as a customer's sub-concious emotional state formed while shopping and which impacts on future decision-making. The model is environmental/psychological and describes store atmosphere effect on purchasing behaviour and retail patronage. It details how the immediate environment's stimuli affect the customers' emotional state (pleasure, excitement, dominance) and thus patterns of acceptance or avoidance. Acceptance means moving closer to environmental stimuli, whereas avoidance leads to rejection of stimuli and thus of stores.

Monroe & Guiltinan and Donovan & Rossiter's models will be connected at the following junction points: environmental stimuli and perceived characteristics of stores; and acceptance-avoidance reactions and decision toward a particular retail store.

2. Research questions for the qualitative study

1. Researching the retail patronage model's adaptability (Monroe & Guiltinan, 1975) and the store atmosphere model (Donovan & Rossiter, 1982) to the Hungarian food retail market.
2. Exploring the segmentation of retail patronage choices.
3. Describing perceived store characteristics and store atmosphere elements. Characterising different store types' typical patrons.
4. Researching purchase strategies applied in the process of store selection. Exploring prices and promotions' role. Explaining the relationship between product choice and retail unit choice. Analysing the situational nature of shopping.

3. Research methodology

3.1. Sample

In the project's first part, **six focus groups** were formed to explore factors affecting the retail store type choice so to construct a complex picture all steps toward choosing a food retail store. This qualitative phase of the research was the starting point and basis of the subsequent quantitative phase. The sample focus groups' population had the following characteristics:

Table 1

Participants of the qualitative study

	18-24 ys of age	25-34 ys of ages	35-44 ys of age	45-54 ys of age
Female	5	11	6	10
Male	5	3	4	4

Source: Own data.

3.2. Method of data collection

3.2.1. Focus groups

The first part of the focus group interviews was conducted in a semi-structured format, lead by a moderator, with the basic goal of appraising the issues in decision-making regarding food retail stores. The topics discussed were the following:

- food purchase habits,
- different store types' description and comparison,
- the role of time,
- shopping and patronage strategies,
- the role of store characteristics and store atmosphere element in the decision-making process,
- the role of information,
- the role of products, prices and quality,
- the role of on-site services.

3.2.2. Kelly's repertory grid technique

In the second step, all participants filled in a **39-item checklist** for each of the store types: small shops, hypermarkets, supermarkets, cash & carry stores, discount stores, specialised shops and markets. Kelly's repertory grid technique was used for the compilation and evaluation of the questionnaire. The main question was the following: *To what extent are the following statements true for small shops, hypermarkets, supermarkets, cash & carry stores, discount stores, specialised shops and markets?* Opposites were placed at the endpoints, and participants had the choice of a 5-point scale between them.

When analysing the results statistically, it is essential to consider that due to the partly qualitative nature of the data and the low number of participants, the generalisability and the reliability of the results are low and unsuitable for drawing well-founded conclusions. The data could only be used as a starting point for further research and for drawing up the basic outline of the food store patronage issue, not to draw final conclusions.

4. Qualitative research results

4.1. Adaptability of models

In the first step of the analysis, it was important to discover the applicability of Monroe & Guiltinan's (1975) store patronage model and of Donovan & Rossiter's (1982) store atmosphere model. The exploratory, qualitative phase of the research seems to support these models' adaptability to the Hungarian food retail patronage situation.

4.1.1. Relationships between customer characteristics and retail patronage

Obviously, general characteristics such as age, gender, community, financial situation and marital status impact greatly on food retail patronage. Psychological factors (role in family, lifestyle, value judgements and personality) also play a role. Further quantitative research is needed to establish clear-cut customer segments based on these characteristics

and the exact interaction of various factors; however, clearly these are the general aspects that determine final decision-making.

The customer's **community** is of utmost importance, as location determines the available store types. In the capital city options range from hypermarkets to small shops and other large cities; however, villages usually only have one small shop and in a nearby town there is possibly a hypermarket. These possibilities are filtered through various consumer groups' mobility factor.

As for **gender,** previous research on consumer behaviour indicated, and the data available confirmed, that men tend to be more rational consumers. Regardless of marital status, their shopping is need driven, and this holds true for larger volume weekend shopping. For women shopping as a freetime activity is more prevalent.

Marital status and related lifestyle seem to emerge as a significant factor: singles' decision-making strategies, as well as those of couples and families differ significantly.

Income and the household financial situation are significant: lower income families are attracted to discount stores and hypermarkets with promotions and discounts; however, there are limited by the opportunities available in a given community.

Based on the qualitative research data, the role of **age** cannot yet be ascertained, and in the subsequent quantitative phase it requires further attention.

Besides the above demographic factors, **psychological factors** are also important. Based on attitudes toward shopping as an activity, the following group characteristics form consumer clusters: shopping as a necessary task, shopping for pleasure, need for information and communication, innovation in shopping, price sensitivity, attraction to discounts and promotions, brand loyalty, demand for high quality, practicality, impulse shopping, and planned and scheduled shopping.

A **crucial factor** that has not so far been mentioned and has been neglected in some previous research is **time.** Its importance is on the rise, and nowadays impacts as greatly as age or gender, especially in the planning phase and at the level of forming purchase and shopping strategies. In the near future, as society and family patterns become more polarised and diverse, it is expected that time will become a key segmentation factor.

4.1.2. The importance of actual and perceived store characteristics

The above social and psychological factors determine which store characteristics are considered most important. The disjointed group of perceived characteristics filtered through selective attention, distortion and memory reflect the larger group of objective store characteristics. Based on the focus group research phase, the factors determining store patronage are the following: the store's general atmosphere, staff, other customers, payment options, prices, products' quality, product choice, discounts and promotions, opening hours, accessibility, parking, trolleys, services available, orientation within the store, brochures and in-store advertising. The customer considers these aspects, and maps them onto the list of characteristics deemed paramount; in the next step, as a result of the comparison, acceptance or avoidance reaction is formed.

In the current research, special emphasis is placed on store atmosphere elements; in Figure 1 results are summarised, using **Donovan & Rossiter's** (1982) **store atmosphere model** as a starting point. Store atmosphere is defined as *conscious planning of the shopping environment with the aim of eliciting certain emotional responses from customers that enhance the probability of purchase*. However, it is essential to clarify that all factors in the decision-making process can eventually be classified as atmosphere elements as they determine or at least influence the customers' habits at a conscious or sub-conscious level.

When interpreting the model, it is clear that acceptance or avoidance attitudes come from two groups of factors. Environmental store stimuli are essentially uniform for all customers; however, their differing needs and perceptions render them a unique personal combinations of factors. These depend on the customer's momentary emotional state, which is described as a mixture of pleasure, dominance and excitement. At the end of this process the potential customer accepts or refuses (avoids) the given store. In the step after acceptance, the shopping experience is evaluated against three criteria: whether the need for a certain product is satisfied, whether communication needs are satisfied, and whether the planned time and money spending goals are achieved. The final evaluation of these factors, information processing, and in-store decisions together determine whether to later return to the store, or avoid it altogether.

Figure 1

A model of store atmosphere

ENVIRONMENTAL STIMULI AT THE STORE

Accessibility
Orderliness in the interior
Parking
Trolleys
Interior design
Number, range, quality and display of products
Display of prices
Well-arranged shelves
Orientation in the store
Staff
Customers
Human factors
Advertising in the store
Scent, lighting
Cleanliness
Temperature
Music
Babysitting service
Standard of services
Cashier zone

EMOTIONAL STATE OF THE CUSTOMER

Pleasure
Excitement
Dominance

ACCEPTANCE OR AVOIDANCE REACTION BY THE CUSTOMER

Enters the store or refuses completely

Finds the necessary product in the store or fails to

Communication needs satisfied or not

Planned time and money spending strategy realised or not

Source: Donovan & Rossiter (1982)

4.1.3. Decision-making Characteristics and strategies

Habits formed during repeated shopping trips have an important influence on subsequent choices and store patronage. Naturally, when interpreting the role of habits in decision-making, the limiting effect of the household budget has to be considered, as nowadays it is the key factor in choosing stores, products and brand. Habits and patterns are formed as a result of rational, objective and subjective factors, from which the cluster of objective factors was detailed during the qualitative research. Years of experience in shopping and the resulting shopping and purchase strategies are decisive depending on the nature of the shopping, whether it is purchase-oriented (task accomplishment) or shopping-oriented (seeking pleasure) (Hofmeister & Törőcsik, 1996). Basic shopping strategies include daily, weekly, weekend and monthly shopping. Irrespective of the above pattern, impulse shopping also appears. Also possible are a mixture of impulse and planned shopping. Other basic forms include shopping for discounts and shopping for special occasions. Day-to-day routine creates strategies of "it's on the way", "same product from same store", "all from one store", or "listening to advertisements". A strategy characteristic of young single households is called "day-by-day".

Both the established patterns of shopping habits and the decision-making behaviour can be modified by the company available for shopping (alone, with family, with friends), and by the person who usually makes the final decision about the purchase of a given type of product.

Therefore, one can conclude that the above factors form the three pillars of decision-making's situational shopping character, meaning previous experience, time perspective, and task identification. The remaining two pillars, the physical and social surroundings, are atmospheric elements.

4.1.4. Decision on retail patronage

Characteristics considered important by individual customers are a reflection or perception of a retail strategy, some of which participants listed and negatively evaluated. Customers are aware of how significanct discounts and sales are, but are generally critical toward the constant competition between stores. Furthermore, a common remark was that food retail stores use all possible "tricks" to gain customers. The word "trick" is hardly a flattering perception of commercial marketing; regrettably, for consumers, honesty and strategies are far apart.

Perceived characteristics, customer characteristics and habits, and experiences contribute to the formation of attitudes toward all store types, and have an immediate impact on the actual patronage decision-making.

After having selected the suitable store for current needs, the process is far from over, as the customer faces a wealth of information within the store prior to the actual purchase. The nature and amount of information varies with location and store type; however, one can outline some general pitfalls. A wide range of products could impair the decision-making process and purchase, especially early on, when the customer is not yet cognizant of the store layout. Oversupply of products, constant rearranging, irregular grouping of goods, unclear price tags, outdated promotion labels, an abundance of in-store advertisements, lack of information and helpful staff are all factors hindering speedy information processing and

swift, problem-free decision-making. A participant expressed the following attitude: "Ideally I could find everything with my eyes closed."

At the end of the process, a product is selected. Following the previous logic, the customer first chooses a store, but a brand and product only within the store; however, with rare and special products, these steps can change order, which in turn influences store selection. Based on focus group data, the conclusion is hardly clear-cut. In some cases, the customer is satisfied with the products purchased and the store's service, and decides to return, thus repeating the decision-making process. But after purchase the customer may find the product inadequate or to have expired, and then not only the producer is blamed, but also the retailer, and an avoidance strategy might result. In other words, adequate service accompanied by inadequate product service can have negative consequences. Choosing products and brands entails various elements and factors that the retailer must not neglect, irrespective of the retailer's market size and position. When formulating product policy, quality and reliability are key issues, as these product attributes are likely to inspire loyalty. Selling specialized *niche* products could prove a useful retail strategy as research has shown that in the market there is room for more than „one-stop shopping" stores.

One cannot ignore retail stores' own-brand products. Results so far reveal that customers consider them cheap low quality goods with poor packaging that might prove unhealthy, even though they know these products are also produced by recognised factories that have their own quality brands.

In Figure 2 is a summary of factors discussed so far.

To date the information and results show that store patronage and decision-making are mult-dimensional complex processes. Every step in the complete model is relevant for the first visit to a store. However, to describe day-to-day decision-making regarding food stores the separate dimensions can serve as sub-models. A clearly separate initial phase is when the customer collects information, evaluates it, and makes a decision, based on perceived store characteristics. In the process the store and the product have an equal weighting, regardless of the sequence for two separate decisions regarding store and product. The Monroe & Guiltinan model and the Donovan & Rossiter models correspond with each other at the level of in-store decision-making.

A separate decision-making path is when the customer chooses a product based on habits and regular shopping and purchase strategies. Here, as a result of previous choice, the product/store relationship is fixed.

Figure 2

Sequence of effects on retail patronage decision-making

Perceived retail strategies

Promotions
Price competition
Ownership
Honesty

Importance of store characteristics

Atmosphere, staff, methods of payment, proce and quality of products, customers, opening hours, promotions, advertisements and leaflets, range of products, parking, accessibility, location, trolleys, additional services, orientation in the store

Characteristics of customer / household
- *settlement*
- *socio-demographic data*
- *role*
- *lifestyle*
- *personality*
- *attitude*
- *financial situation*
- *time*

Perceived store chacacteristics

Selective attention, distortion, memory

Attitude to stores

Small shop Specialised shop Hypermarket Supermarket Discount store C+C store Market

Choosing a store

General opinions and habits in the purchase process

Subjective and objective factors
The situational nature of shopping
Purchase strategies

Information within the store

Range of products, display, on-site ads, price display, staff

Planning and budget strategies

Spending and shopping strategies

Shopping for products and brand names

Price, quality, reliability

Satisfaction

Source: Monroe & Guiltinan (1975)

4.2. Perceived characteristics of store types

In the second part of the paper, three methods are used to analyse the checklists completed by the participants.

In the checklist's first part, focus was on perceived store characteristics. The results indicate the participants' opinion regarding different food retail stores' general characteristics and attributes. It should be noted that customers evaluate the store types based on a composite of important characteristics rather than definitions provided in the pertinent literature. In the next phase individual factors' effect on the various distinct steps of the decision-making process will be investigated in a quantitative research project.

Table 2 lists the most distinct characteristics of store types, based on statements from the checklist.

Table 2

Store type characteristics as perceived by customers

CHARACTERISTICS	PERCEIVED ASPECTS
Location of stores	Hypermarkets and C+C stores are located in the outskirts, other store types are closer to the centre
Reliability of products	Hypermarkets and supermarkets are the most reliable, small shops and markets are the least reliable
The traditional character of range of products	The range of products in hypermarkets, supermarkets and C+C stores is fundamentally different from more traditional retail points
The role of own brands	Hypermarkets, supermarkets and C+C stores have their own brands
Product package size	Large product sizes and buying in bulk are characteristic in hypermarkets and C+C stores
Promotions	Hypermarkets offer the largest number of promotions, followed by discount stores and supermarkets
Prices	Hypermarkets have the lowest prices, small stores and specialised shops have the highest prices
Opening hours	Hypermarkets have the longest opening hours, time is not a limiting factor
Accessibility	In the case of stores outside the centre, public transport, access roads and suitable parking places are of utmost importance
Waste of time in the store	The small number of cashiers is a problem at large stores, shopping is quickest in small shops and specialised shops
Clean, friendly environment	Small shops and specialised shops are perceived the best, hypermarkets the worst regarding cleanliness and atmosphere
Crowd	Hypermarkets have the most products and the most people
Staff	Difficult to contact in hypermarkets, most helpful in small shops and specialised shops
Related services	Pointed out as one of the most important advantages of hypermarkets
On-site advertisement	Hypermarkets and supermarkets are "information bombs"

Source: Own data

To group store types based on 39 items' average values store characteristics were submitted to factor analysis . Data were suitable for factor analysis (KMO: 0.721, Bartlett spherical test Approx.Chi Square = 203.742, Sig. = 0.000). The Maximum likelihood method was selected, Varimax rotation was applied. The resulting three factors account for 79.811% of variance. Factor loadings for the three factors are presented in Table 3 in the form of a rotated factor matrix.

Table 3

Rotated factor matrix: store types and their factor loadings

	Factor		
	1	2	3
HYPERMARKETS	**0.965**	-0.149	0.212
C+C STORES	**0.824**	-0.282	0.145
SPECIALISED SHOPS	-0.348	*0.897*	0.272
SMALL SHOPS	-0.310	*0.688*	0.412
MARKETS	-0.036	*0.521*	0.156
DISCOUNT STORES	0.181	0.351	*0.901*
SUPERMARKETS	0.401	0.354	*0.721*

KMO = 0.721 Bartlett Approx.Chi-Square = 203.742 Sig = 0.000
Rotation Sums of Squared Loadings (%) = 79.811 Maximum likelihood, Varimax
Source: Own data

The groups formed as a result of the factor analysis above are further justified by a two-dimensional MDS plot of scaled store characteristics. The only difference is regarding the classification of markets: in the factor analysis they were related to small shops and specialised shops, but appear in the MDS plot, presented below as Figure 3.

Figure 3

Store types' relationship in a two-dimensional space

Delivered Stimulus Configuration
Euclidean distance model
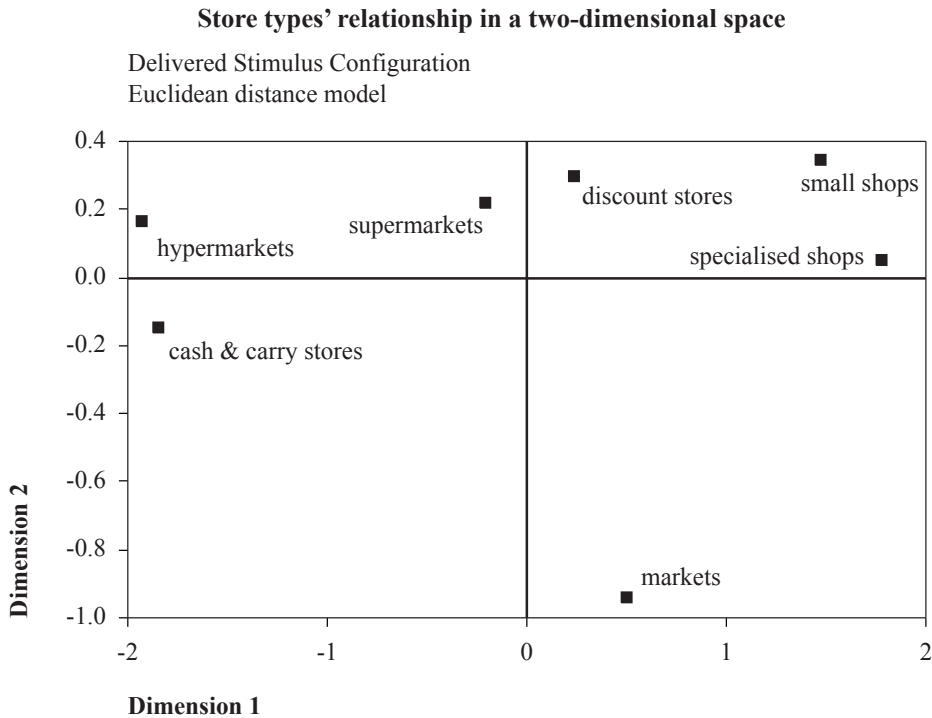
Source: Own data

The analyses show that hypermarkets and cash & carry stores form the first group; specialised shops, small shops and, to some extent, markets compose the second, whereas, discount stores and supermarkets are in the third. The results lend themselves to interpretation: the relationship between large-sized hypermarkets and cash & carry stores is not surprising as both provide a wideproduct selection and constant discounts, and are characterised as "information bombs". However, small shops, specialised stores and markets with fewer products and a more intimate atmosphere offer a more traditional and familiar feel. Moreover, to some extent markets seem unique as they have a distinct character and choice of products. Customers perceive supermarkets and discount stores as almost identical and many find it difficult to distinguish between them.

In the next step, to analyse the checklist results, **Kelly's repertory grid technique** was also applied. The version adapted by Grunert & Steenkamp (1989) for marketing research was used. This technique enabled the researchers not only to establish store type groups, but also to classify decision-making process factors. We were able to certify that the store types correspond to the MDS plot results. One can conclude that the following distinct groups are formed: hypermarkets and cash & carry stores ($r = 0.97$); discount stores and supermarkets ($r = 0.97$); specialised shops and small shops ($r = 0.95$); markets. On the horizontal (perception) part of the grid this classification is displayed. The vertical (mental) part of the grid displays the related store characteristics, detailing how the above listed store type groups were formed. An analysis of the mental map revealed that there are two distinct characteristic categories influencing decision-making.

Atmospheric elements compose the first group, such as the number of customers and products, cleanliness, order, orientation, helpful staff, cashiers, general atmosphere. The second cluster of factors is related to *efficient shopping*: elements include accessibility, parking, trolleys, amount of information, availability of staff, and services. It is important to note that *prices and discounts* are completely independent and unrelated to either group, supporting the supposition that prices are a part of the planning and budget strategy, and have an independent impact on the decision-making process at a different phase.

5. Research questions for the quantitative study

1. The frequency of visits to the different food retail store types. (Categories: daily, 4-5 times a week, 2-3 times a week, weekly, every two weeks, monthly, rarely, never.)
2. The time and money spent on an average shopping trip when shopping for essentials.
3. The time and money spent on a average shopping trip when shopping for supplies.
4. The usual place of purchase for basic food types.
5. Characterising the individual store types using the adjectives elicited in the qualitative phase (friendly, honest, familiar, modern, pleasant, huge, weird, nice, small, special, run-down, warm, reliable, out of date, practical, dishonest, orderly, cold, free, colourful, good quality, clean, attractive, quiet).
6. The perceived characteristics for different store types.
7. The customers' attitudes to different store types.
8. Characterising customer types based on their attitude to shopping and decision-making regarding patronage, shopping, and purchase habits.
9. The following store types were considered: discount stores (Penny, Plus, Profi), supermarkets (Match, Smatch, Spar, Billa, Kaiser's), hypermarkets (Tesco, Auchan, Cora, Interspar), cash & carry stores (Metro, Interfrucht), specialised stores (bakery, dairy shop, greengrocer's, butcher's, sweets shop), markets, small shops.

6. Research methods

6.1. Sample

Sampling was based on the strict random walking method with 110 starting points, structured sampling, and a matrix considering community and region. The resulting representative sample **(N = 1029)** was gathered using census data by the Central Statistical Office for the year 2001, the components being age, gender, level of education, region and community. In 2005 data were collected from personal home interviews, using a *standardised questionnaire* constructed with the help of data from previous research.

6.2. Characteristics of the sample

Table 4

Sample's demographic characteristics (N = 1029)

Gender	Female 53%	Male 47%			
Qualification	Primary school or lower 45%	Vocational school 19%	Secondary school degree 25%	College or university degree 11%	
Age group	15-24 years of age 17%	25-34 years of age 18%	35-49 years of age 25%	50-64 years of age 22%	over 65 years of age 18%
Marital status	Single, staying with parents 19%	Single, living alone 6%	Married 50%	Divorced 10%	Widowed 14%
Income	Low 20%	Lower-middle 17%	Upper-middle 15%	High 15%	
Place of residence	Budapest (capital city) 18%	Village 35%	Small town (less than 50,000 inhabitants 28%	Town (more than 50,000 inhabitants) 19%	

Source: Own data

7. Quantitative study's results and analysis

7.1. Frequency of patronage spanning store types, average patronage

Table 5

Frequency of patronage across retail store types in the entire sample, in %, N = 1029

	Daily	4-5 times a week	3-4 times a week	Once a week	Once every two weeks	Once a month	Less frequently	Never
Hypermarket	1	1	5	11	11	22	21	26
Supermarket	5	4	6	10	7	8	17	40
Discount store	9	4	6	14	6	12	21	26
Cash and Carry	0	0	0	2	2	8	24	60
Specialised shop	11	4	9	17	7	4	16	29
Small shop	36	9	13	10	4	3	12	13
Market	2	2	6	19	6	8	28	27

Source: Own data

It is essential to point out the statistically significant relationship between patronage and demographic data. Listed below are the majors ones. In all cases Pearson Chi Square is lower than 0.05.

- Regarding gender, the lack of significant differences is the typical trend. Men tend to visit cash & carry stores frequently, and shop at small shops every two weeks or monthly. Daily visitors to markets tend to be women.
- Regarding community types, those living in villages and small towns visit hypermarkets the least frequently. Those living near the capital visit weekly or monthly. Customers in villages visit small shops for daily shopping, whereas those in cities frequent them on a monthly or biweekly basis.
- Regarding occupation, retired customers do not visit any store types very frequently.
- Regarding income, it is noteworthy that generalisability and conclusions are limited by distortions from participants. Nevertheless, it can be concluded that frequent specialised shop visitors tend to have a high income. Furthermore, those who visit small shops daily tend to have a low income, whereas weekly visitors to small shops classify themselves as middle or high income.

In the current phase of the research, a further area to investigate was the typical place of purchase for certain product categories. Table 6 summarises the results.

Table 6

The relative frequency of retail store patronage broken down for food types (in %, for the entire sample of N = 1029)

	Discount store	Super-market	Hyper-market	Cash and Carry	Specia-lised shop	Market	Small shop	Does not buy product	No answer
Bakery	12.2	9.5	6.5	0.3	17.0	1.6	46.6	4.9	1
Dairy	16.1	11.9	9.5	0.8	5.5	2.4	44.7	6.7	2
Frozen	16.5	10.9	22.4	1.9	1.5	0.4	14.9	29.9	1
Instant	14.8	10.0	20.7	2.1	1.0	0.4	12.5	36.6	1
Sweets	18.8	11.6	15.6	1.2	2.5	1.1	34.7	12.4	2
Soft Drink	19.6	11.2	16.9	2.4	1.5	0.3	33.2	13.6	1
Alcohol	11.1	6.2	15.7	2.5	0.8	0.3	18.6	43.5	1
Alternative food	4.2	3.6	6.4	0.4	3.1	1.6	4.6	74.5	1
Bio food	3.0	2.4	4.1	0.1	3.5	2.5	3.7	78.9	1
Vegetables and fruits	7.0	4.8	7.0	0.6	18.6	28.0	13.7	18.1	2
Canned	21.1	9.1	21.4	3.3	1.1	0.4	20.5	20.9	2
Sauce, dressing	15.4	9.4	17.5	2.1	0.6	0.1	10.5	42.3	2
Cold cut	16.9	11.1	12.2	1.4	7.7	2.2	36.3	9.6	2
Meat	8.9	7.1	15.4	1.8	25.7	9.9	11.9	16.8	2
Mineral water	20.1	9.3	19.9	3.2	1.2	0.6	23.0	20.5	2
Spices	22.5	11.9	23.6	2.7	1.3	0.5	27.9	7.8	1
Coffee, tea	22.8	11.8	22.7	3.3	1.5	0.7	26.7	8.6	1
Flour	23.2	11.7	23.5	3.2	1.5	0.4	26.3	8.5	1
Egg	9.7	6.4	7.4	0.7	7.8	19.9	17.9	28.3	1

under 5% (very rarely)	5% - 10% (rarely)	10% - 20% (sometimes)	20% - 30% (often)	over 30% (very often)

Source: Own data

It is obvious that, for bakery and dairy products, small shops dominate. The hypermarkets' share is limited to planned shopping for supplies sprees, or to those living near hypermarkets and they tend to be women over 50 in smaller cities in the countryside who live in housing estates.

When it comes to planned weekend or monthly shopping trips, hypermarkets are the main outlet for frozen and canned goods, mineral water, spices, tea and flour. For daily supplies falling in the previous categories, small shops are most commonly used.

7.2. Perceived store characteristics

In the following step, only the hypermarket patrons' results are analysed; from the sample were exluded those shoppers who never visit this kind of store (N = 739). However, other store types are not excluded from the analysis.

With the help of a checklist containing 44 items each store type was characterised. For describing store types, a table was constructed using the relative image calculation technique, which allows for the deduction of the halo effect. The halo effect appeared when customers described the stores they knew well, which thus became over-represented in the responses. The final figures in the table display actual image performance; a positive figure signifies image strength, negative values represent image weakness. The sample size determines what is classified as a significant difference; empirical experience shows that values over +0.2 and under -0.2 can be considered as reliable store type descriptors.

Table 7

Perceived characteristics of store types in the case of hypermarket patrons (N = 736)

	Discount	Super-market	Hyper-market	C&C	Specia-lised	Market	Small shop
Lots of discount-price products	92%	40%	42%	16%	-68%	-57%	-66%
Orderly shelves	21%	34%	-5%	-12%	3%	-42%	1%
Clear price tags	21%	9%	-18%	-28%	15%	-11%	12%
Wide range of products	21%	39%	20%	52%	-60%	-15%	-57%
Sufficient parking	30%	16%	69%	109%	-85%	-53%	-86%
Products beyond date of expiry	26%	-1%	-21%	-23%	-20%	7%	31%
Bank cards accepted	53%	81%	34%	63%	-79%	-72%	-81%
Spectacular displays	-7%	16%	14%	-17%	4%	38%	-49%
Services (e.g. post office)	-58%	32%	198%	38%	-79%	-63%	-68%
On-site advertisements	31%	70%	54%	16%	-53%	-63%	-55%
Qualified staff	-16%	-15%	-40%	-21%	69%	6%	16%
Free parking	17%	8%	2%	37%	-20%	-13%	-31%
Suitable for buying specific products	-36%	-60%	-76%	-76%	70%	46%	133%
Good scents	-52%	-42%	-35%	-54%	158%	47%	-23%
Large packages, buying in bulk	6%	-19%	3%	264%	-84%	-80%	-89%
Long queues	57%	38%	31%	85%	-50%	-90%	-71%
Music	-47%	46%	127%	43%	-60%	-54%	-55%
Troublesome security service	36%	35%	17%	50%	-42%	-36%	-60%

	Discount	**Super-market**	**Hyper-market**	**C&C**	**Specia-lised**	**Market**	**Small shop**
Easily accessible	2%	-19%	**-44%**	**-47%**	**12%**	**46%**	**51%**
Personalised service	**-67%**	**-70%**	**-81%**	**-79%**	**76%**	**136%**	**85%**
Large trolleys	**54%**	**34%**	**38%**	**119%**	**-79%**	**-83%**	**-82%**
Polite staff	**-42%**	**-46%**	**-66%**	**-65%**	**74%**	**75%**	**70%**
Suitable opening hours	-2%	2%	0%	1%	-7%	8%	-3%
Free plastic bags	**-35%**	**38%**	**132%**	-13%	**-50%**	**-27%**	**-45%**
Convenient location	-7%	**-33%**	**-61%**	**-85%**	**37%**	**33%**	**116%**
Products easy to find	8%	**-25%**	**-53%**	**-63%**	**28%**	**46%**	**60%**
Shopping is time-consuming	-4%	15%	**65%**	**96%**	**-72%**	**-23%**	**-77%**
Always crowded	**38%**	**31%**	**61%**	**53%**	**-80%**	-20%	**-83%**
Wide range of brands for all kinds of products	0%	**43%**	**54%**	**66%**	**-51%**	**-41%**	**-71%**
Only small baskets	**-60%**	**-72%**	**-88%**	**-83%**	**104%**	**-36%**	**235%**
High quality products	-19%	-7%	**-34%**	**-25%**	**58%**	**37%**	-9%
Wide range of fresh products (vegetables, meats)	**-40%**	-16%	-15%	**-38%**	**114%**	**23%**	**-28%**
Changing arrangement of goods	-11%	**40%**	**79%**	17%	**-51%**	**-37%**	**-36%**
Wide range of own brands	2%	**46%**	**73%**	**70%**	**-66%**	**-66%**	**-59%**
Suitable for shopping when the household has run out of everything	11%	**-25%**	**55%**	**33%**	**-50%**	**-36%**	**13%**
Offers everything needed	14%	19%	**50%**	14%	**-54%**	**-28%**	-15%
Questionable quality	14%	**-32%**	-21%	**-41%**	**-29%**	**115%**	-6%
Good prices	**80%**	-13%	16%	6%	**-63%**	20%	**-46%**
Personal contact	**-45%**	**-71%**	**-83%**	**-91%**	**56%**	**82%**	**152%**
Products not available elsewhere	**-27%**	**-25%**	**40%**	22%	**-26%**	**72%**	**-56%**
Staff contacted easily	**-45%**	**-62%**	**-81%**	**-83%**	**87%**	**81%**	**102%**
Enough baskets / trolleys	**29%**	18%	-6%	2%	**-21%**	**-53%**	**30%**
Frequent promotions, lucky draws, free samples	**-26%**	**76%**	**144%**	13%	**-70%**	**-63%**	**-75%**
Suitable temperature	10%	11%	-9%	-8%	**23%**	**-36%**	9%

Source: Own data

7.3. Segments of hypermarket patrons

The segmentation of hypermarket patrons was conducted based on their shopping habits, purchase attitudes, decision-making on store patronage, and individual strategies. Five-point scales were used in the items surveying segmentation. K MEANS cluster analysis was applied to the data, missing data were handled with the Exclude cases listwise method. During the process, the sample was reduced to 522, as participants with unanswered items were excluded. Clusters were described using a one-way variance analysis, with all factors having a significant contribution (< 0.05). The resulting four clusters are presented in Table 8.

Table 8

Segments of hypermarket patrons

	Settled and mature N = 122	Impulsive young people N = 86	Purchase-oriented N = 221	Seeking for optimal solutions N = 93
Shopping characteristics	Tend to search for novelties	Enjoy shopping	The group least interested in novelties	The group to enjoy shopping the most
	Enjoy shopping	Use promotion opportunities occasionally	The group that likes shopping the least	Do not consider shopping as tiring or waste of time
	Careful spenders	The least price-sensitive	Shopping is tiring	Consider shopping as a freetime activity away from home
	Shopping as a freetime activity away from home	Enjoy looking around while shopping	Shopping is not a good freetime activity	the group to get the most excited about promotions and special offers
	Enjoy the crowd while shopping	Not the most faithful to brands	Disturbed by crowds	The group to enjoy most the chance to look around
	Like promotions and discounted prices	The group most focused on quality	The group least interested in promotions	Shopping is a pastime, not a necessity
	Most likely to do shopping together with family, even with grown-up children	The group least concerned with being able to buy all in one place	The group to like shopping with the family the least	The group to be the most concerned about products and prices
	Intend to get over with shopping quickly, not the main freetime activity	The group least likely to do planned shopping	Do not enjoy looking around, want to get over with shopping quickly	The group to stick to brands the least
	Careful about products, prices, quality	The group most likely to do shopping at night	Shop because they have to, aim to finish quickly	Consider traditional brands and no-name brands of the same quality, the difference is the price of advertising
	Tend to stick to brands		The group to be the least careful about products and prices	Consider Hungarian products the same quality as imported goods
	Like to do daily shopping alone		Do not focus on quality in the first place	Consider branded products and store's own brands of the same quality
	The group to aim for "all in one place" attitude		Do not care at all about advertisements	The group to care the last about scheduled and planned shopping
	Only shop for food when stocks have run out at home Scheduled shopping		Do not go to another shop if a favourite product is not available	The group to take advertisements the most into consideration, use all resources to make the optimal decision
	Planned shopping			Consider store brands as more favourably prices than branded goods

	Settled and mature N = 122	Impulsive young people N = 86	Purchase-oriented N = 221	Seeking for optimal solutions N = 93
Social and demographic characteristics	Tend to be women	Tend to be women	Tend to be men	Tend to be women
	Tend to be over 50 years of age	Highest proportion of under 25 group Lowest proportion of over 65 group	No distinct age group	The group with the lowest proportion of under 25 customers
	Tend to be married	Tend to be single	No distinct marital status	Tend to be married
	Lower than average proportion of university graduates	Tend to have secondary school degree	Higher than average proportion of university graduates	The group with the lowest proportion of highly qualified people and the largest proportion of primary school graduates
	Tend to live in small towns	Tend to live in towns and small towns	Tend to live in the capital	Tend to live in towns
	Mostly couples with grown-up children	Tend to be large families		Lowest per capita income
	Highest per capita income			
Retail patronage habits	Most frequent patrons of discount stores	Visit hypermarkets once every two weeks or once a month	Do not visit hypermarkets out of their own free will, tend do so because of family pressure	Typical discount store patrons
	Typical customers in supermarkets			Tend to visit hypermarkets once a week or twice a week The group to like hypermarkets the most
				The group to visit supermarkets the least

Source: Own data

Moreover, it is essential to survey the time and money spent by members of each segment on a typical essentials shopping trip or when shopping for supplies. Purchase-oriented customers spend the least (12,255 HUF), impulsive young people spend the most (16,720 HUF). Purchase-oriented customers also spend the least time on average (90 mins), whereas those seeking optimal solutions stay the longest (138 mins) on a typical supplies shopping trip.

8. Summary

The qualitative phase's aim in the research project was to establish Monroe & Guiltinan's store patronage model's applicability or adaptability, and also that of Dono-van & Rossiter's store atmosphere model in Hungarian food retail. According to the results, both models have proven adaptable. The qualitative data also revealed the factors having the most significant influence on the decision-making process. A small-scale sample was used to tap into the similarities in the different store types' perceived characteristics.

From the qualitative phase's conclusions and ideas, a standardised questionnaire was constructed, focusing on monitoring the frequency of visits to different store types, the typical purchase point for different kinds of goods, and perceived store types' characteristics. In the final step, hypermarket patrons were segmented using cluster analysis.

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The application of multivariate statistical methods for understanding food consumer behaviour

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Abstract

Understanding consumer behaviour is a necessary precondition for a targeted communication strategy. The behaviour is a complex phenomenon and research needs to undertake a rigorously apply sophisticated methods. This article entails the combined utilisation of categorical principal component analysis and cluster analysis to determine the major, relatively homogenous consumer groups and this is coupled with confirmatory factor analysis and structural model building to understand consumer behaviour, based on Fishbein and Ajzent's theoretic model.

Keywords

Categorical principal component analysis, cluster analysis, confirmatory factor analysis, consumers' segmentation, structural model building

1. Introduction

During the last ten years, the number of publications on the food safety issue has exploded. These publications' common features are the following: (1) They concentrate mainly on food safety problems in developed states. (2) Consumer behaviour is analysed through a precise demographic or sociological segment of society, or one well–defined product category (Sapp, 2003). (3) Mainly attitude scales are used to investigate and, to anaylse research results, they utilise classical data analysis methods, which were developed for values analysis which are measured on a numeric scale. Consumer segmentation as well as understanding motivation are essential for consumer education and for working out a better risk communication strategy (Porter, 1980). To achieve this it is not enough to apply results in the field of consumer research because Hungarian consumers' socio-economic situation differs considerably from that in developed states. The major specific features regarding this can be summarised as follows: (1) After the dissolution of state-farms and co-operatives, the number of small and middle-size agricultural producers has increased; (2) food industry privatisation has been mainly accomplished by foreign direct investment (3) because of economic transformation and privatisation a bipolar food industry structure and trade have been formed: on the one hand, large concentrated economic entities; on the other hand, a large number of smaller scale entities often with backward processing capacities (4) income differences among the population have increased, eclipsing those in Western-Europe (5) there has been a rapid proliferation in snack bars and other facilities representing a trend of *outside home* eating, often resulting in unsatisfactory hygienic conditions.

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2. Hypothesis development

We have carried out a critical review of the pertinent literature. We have also conducted interviews with leading Hungarian food safety specialists, food safety agencies, and various enterprises. From the previous research, we have derived the following hypotheses:

H$_1$ Among Hungarian consumers there are different approaches towards the food safety problem. These approaches can be quantified (measured) by Likert-type attitude-scales (Likert, 1967), and separated by multivariate statistical methods.

H$_2$ Based on awareness of the respondents' attitude-system, it is possible to distinguish between different consumer groups. Thus we will be able to form relatively homogenous consumer clusters, making communication easier.

H$_3$ Food consumer behaviour can be explained through the general theory of the well-known Fishbein-Ajzen model of planned behaviour. In trying to understand the basis for consumer behaviour psychologists, marketing specialists, and health educators have compiled an impressive list of factors and constructs which at times have been deemed relevant, but these factors are hard to apply. That's why we have a rather simple, but easily applicable method of investigation, meaning the Fisbein-Ajzen (Collins & Wugelther, 1992; Fishbein & Ajzen, 1974) model. Probing the causes for human behaviour, Ajzen and Fishbein state, that "*the ultimate determinants of any behaviour are the behavioural beliefs concerning its consequences and normative beliefs concerning the prescriptions of others*" and "*variables other than these two components (are) shown to affect behavioural intentions and overt behaviours indirectly by influencing one or both of the components*". This certainly curtails the number of relevant factors influencing consumer behaviour and explains why this approach has been used to analyse consumer behaviour. Behaviour is defined as "*Observable acts ... that are studied in their own right*". The model provides a framework to study attitudes toward behaviour. According to the theory, the most important determinant of a person's behaviour is behavioural intent. The individual's intention to undertake a given behaviour is a combination of attitude toward undertaking the behaviour and subjective norm. If a person perceives that the outcome from performing a behaviour is positive, she/he will have a positive attitude torward performing that behaviour. If the person's *significant others* see the behaviour as positive and the individual is motivated to meet their expectations, then a positive subjective norm is expected. Attitudes and subjective norm are measured on scales (as an example the Likert Scale) using phrases or terms such as like/unlike, good/bad, and agree/disagree. A positive product indicates behavioural intent (Glanz et al., 1997). Behavioural intention's third determinant is perceived behavioural control. This perception can reflect past experiences, anticipation of upcoming circumstances, and influential norm attitudes that surround the individual (McKenzie & Jurs, 1993).

3. Methodology

The overall research design has been quasi experimental and multifactorial. It is therefore largely quantitative and deductive, rather than qualitative and interpretive (Galser & Strauss, 1967).

Focus group interviewing was the method used to study consumer experience regarding safety of food industry products. Topics were selected in advance but actual questions were not precisely specified.

Based on interview results, we developed multi-item scales, following standard psychometric scale development procedures. To determine the consumers' attitude system, we utilised Likert-type interval scales. In general, for these surveys, 1-7 scales are utilised, but in Hungary from elementary school to universities the 1-5 scales are utilised (5-very good ... 1-unsatisfactory). That's why the questions about attitudes were scored on a five-point Likert scale, with options 5 strongly agree, 4 basically agree, 3 uncertain, 2 rather disagree, 1 strongly disagree.

To save respondents' time, two surveys were completed. Each of the surveys was based on more than 600 respondents. The sample was representative in terms of gender. In the samples better educated people were over-represented as well as village dwellers and younger respondents. This does not make interpretating the results inaccurate because relatively younger, better educated respondents can be considered as trend-setters; awareness of their attitudes is revelatory about the future attitude system and Hungarian consumers as a whole.

The questionnaire was composed of more than 500 items. The questions encompassed different aspects of consumer behaviour.

It is well-known that factor analysis attempts to identify underlying variables, or factors, that explain correlation patterns within a set of observed variables, but utilising factor analysis for quantities, determined on an interval scale, is rather biased (Joereskog & Sordom, 1999). That's why we had to apply an analogous method for categorical data. This algorithm was categorical principal component analysis, of which the procedure simultaneously quantifies categorical variables while reducing the data's dimensionality (SPSS Inc., 2002).

Based on Chronbach's alpha, a reliability analysis was conducted In Colon's (2000) opinion, the interpretation of Cronbach's alpha coefficients of 0.75 and above are generally acceptable. Between 0.65 and 0.75, they are often used, although it must be recognised that there is some instability in the instrument. Below 0.65 it is difficult to form solid conclusions regarding the data, although you will notice that sometimes this occurred.

Based on eigenvalues and Cronbach's alpha, for further research we utilised three dimensions. As with classical factor analysis, it is possible to determine each respondent's component scores. Using the individual score values as starting points, the city–block method of cluster analysis (based on Euclidean-distance measure) have been used (Horváth et al., 2001). Relying on the experts' opinion, using heuristic methods, a quasi-optimal number of principal components and factors was determined.

To operationalise this model we utilised a series of questions. Regarding the consumers' information study, the "behaviour" was determined by answering four questions.

Using the Fishbein-Ajzen theory, we were able to determine the factors system, influencing consumer behaviour by confirmatory factor analysis and structural equation modelling. Confirmatory factor analysis was used to study the relationships between a set of observed variables and a set of continuous latent variables. Concepts such as "attitude" or "perceived control" are hard to quantify and that's why we approximated them by the respondents' level of acceptance toward certain statements, which reflected a given statement, or its negation.

Structural equation modelling included models in which regressions among the continuous latent variables were estimated. The conventional way of determining structural equation models is Lisrel software. We utilised analogous, more user-friendly software for this purpose: Mplus, Statistical Analysis Software for Latent Variables analysis (Muthén, 2002). The algorithm applied was the weighted least square parameter estimates with conventional standard errors and chi-square test statistic using a full weight matrix (Muthén & Muthén, 2004).

4. Results

The application of categorical principal component analysis to our data set led to the conclusion that the first six dimensions (with terminology of factor–analysis: factors) had an eigenvalue above 1. Each of the dimensions listed in Table 1 was labelled by an appropriate name according to the components that loaded most highly for that dimension.

Drawing from eigenvalues and Cronbach's alpha, three dimensions were accepted for further investigation. According to their individuaual score, respondents were classified by cluster analysis. Utilising these scores we were able to determine the most important groups of Hungarian consumers (Table 2).

The model construction to determine the most important influencing factors yielded a chi-square test acceptable result (Fig. 1). The chi-square test showed that model's suitability was not significant, indicating null hypothesis. One cannot dispute that the model corresponds with the data. This finding was corroborated by Root Mean Square Error of Approximation (RMSEA) statistics. According to Hu and Bentler (1999) the recommended cut-off value is 0.06. The RMSEA estimation was 0.04, and that's why the model fits well. The structural model describes two types of relationships: the relationships between observed variables and latent variables, and that among latent variables. The directly observed variables are indicated by ellipses. The continuous latent variables (attitude, norms, perceived control) are indicated by rounded rectangles. The behaviour itself (marked by a rectangle) was measured by four indicators. These indicators were marked by pentagons. The graph shows the unstandardized coefficients. Each unstandardized estimate represents the amount of change in the outcome variable as a function of a single unit change in the variable causing it. For instance, for each single unit change in the "attitude" latent factor, plus the agreement level with the statement: "I want to be informed on food safety" increases by 1.301 units. By definition, the first estimate in each group of variables is set as 1.

Figure 1

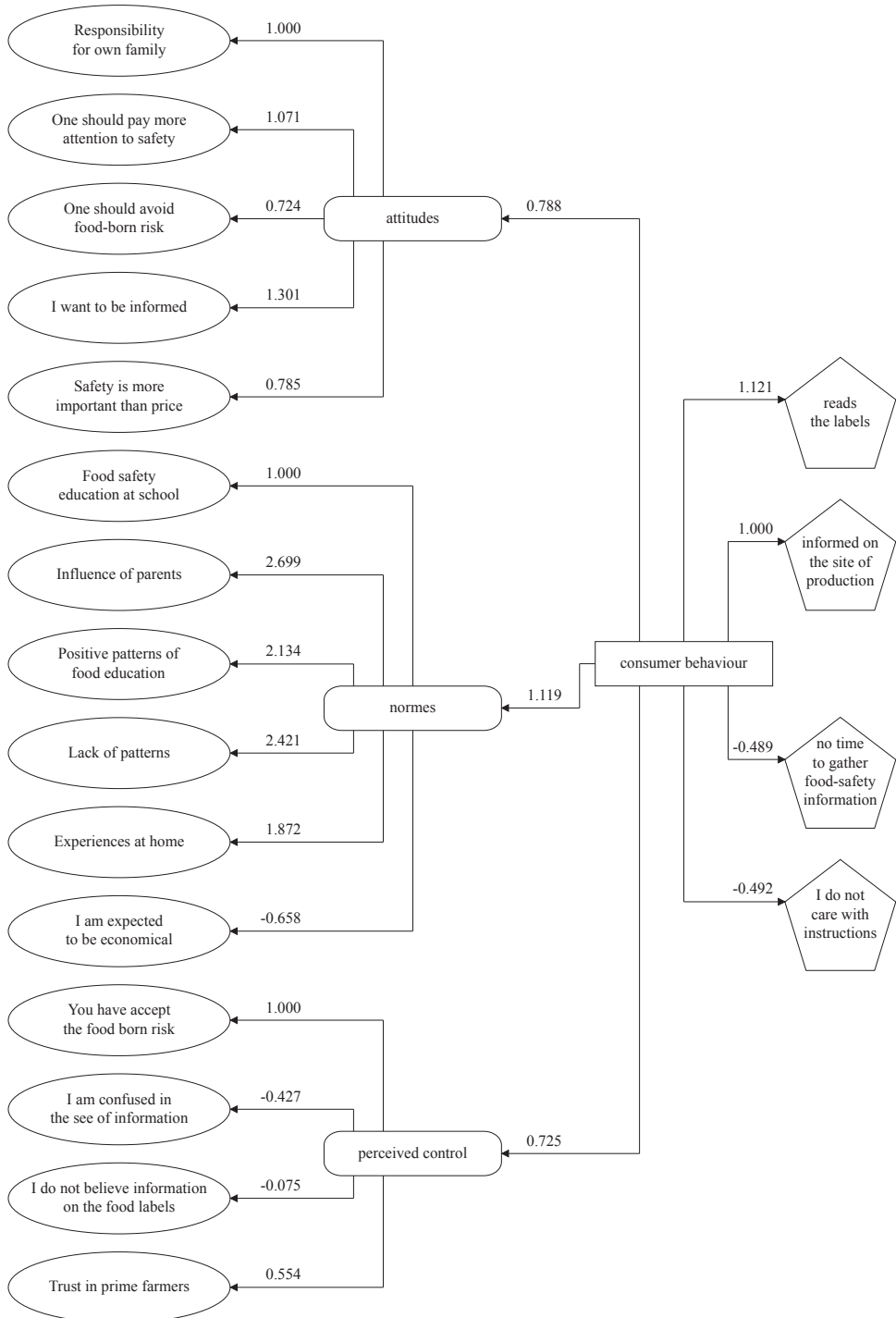**System of factors, influencing the food consumer behaviour**

Table 1

Results of principal component analysis

Statement	Dimension					
	1	2	3	4	5	6
	Carelessness	Optimism	Responsibility	Demand	Anti-globalisation	Risk-acceptance
The food products in the Hungarian trade are safe and do not mean any threat to consumer	0.136	**0.572**	0.142	-0.296	0.013	-0.009
The import of foreign products increases the danger of food-borne diseases. One has to buy food with great precaution	0.034	0.110	-0.032	0.104	**0.645**	0.021
The food quality and safety has been increased as a result of technical progress and the improvement of food processing technologies	0.057	**0.666**	0.162	0.011	-0.077	-0.183
The main cause of food-borne diseases is the carelessness of the food consumers	0.134	-0.056	0.249	0.236	0.342	0.188
The consumers do get so much, sometimes contradictory information on food safety, that the man/woman of the street hardly get ones bearings	0.050	-0.114	0.063	-0.012	0.410	**0.591**
The food safety in Hungary is well regulated and guaranteed by severe government control	-0.115	**0.729**	-0.125	0.058	0.157	0.119
If the health of others depends on you (e.g. you have children) you must do all in your capacity to supply them with safe food	-0.138	0.116	**0.748**	-0.148	0.065	0.053
It is very important for the consumers to be continuously informed on food safety issues	-0.087	-0.021	**0.767**	0.175	-0.029	-0.048
The Hungarian consumers have access to a wide range of reliable pieces of information on food safety	-0.023	**0.646**	-0.055	0.160	-0.054	0.026
The food consumption is a dangerous thing with its own threats.	0.207	0.148	-0.038	-0.027	-0.088	**0.715**
The quality of Hungarian food products has been increased as a result of the foreign direct investments into Hungarian food industry	0.120	0.506	-0.026	0.108	-0.321	0.316

Statement	Dimension					
	1	2	3	4	5	6
	Carelessness	Optimism	Responsibility	Demand	Anti-globalisation	Risk-acceptance
I have not time and energy enough to pay special attention, when and what I eat	**0.815**	-0.032	0.072	0.024	-0.037	0.095
I have a lot of more important problems in my life. I do not worry myself with the food safety problem	**0.839**	0.038	-0.093	-0.086	-0.081	0.076
One has to pay special attention to food-borne risks	-0.190	0.022	0.447	**0.497**	0.192	-0.082
I want to know more on that, how to defend myself and my family against the food-born diseases	-0.219	-0.042	**0.508**	**0.468**	0.198	0.022
In the era of our parents and grandparents the food safety issue got much lesser emphasis, but they were in a good health condition. This is an overemphasised topic	**0.598**	0.076	-0.171	-0.210	0.198	0.103
This food safety issue is the problem of yawning housewives	**0.610**	0.012	-0.321	-0.016	0.096	0.061
I am ready to pay more if I can get a serious guarantee on the safety of the food product	-0.232	0.032	0.094	**0.708**	-0.041	0.261
In opinion of my relatives and acquaintances I am too meticulous on food safety related questions	0.091	0.106	-0.040	**0.772**	0.100	-0.181
In era of our parents and grandparents the quality of food was much more safer. The modern, industrialised food production is more hazardous	0.208	-0.270	-0.071	0.097	0.473	0.322
The globalisation of the food trade threatens the food safety. The safety of imported food products is lower	-0.058	-0.064	0.133	-0.022	**0.722**	-0.065
Eigenvalue	3.562	2.468	2.048	1.474	1.368	1.083
Cronbach's alpha	0.854	0.723	0.636	0.337	0.282	0.080

Table 2

Typology of Hungarian food consumers
(in brackets the average evaluation values of possible answers, on an 1-5 itnerval scale)

| | Phantasy –names of the segments | | | | |
	Unsure curious	Optimistic technocrat	Indifferent	Distrustful curious	Conservative cautious
Share (%)	38	5	12	27	18
Typical respondent of the cluster	Middle aged respondent, who is living in a middle-scale country town. Hers/his highest qualification level is secondary school. Hers/his qualification or work is not joining to the food chain	Food industrial specialist with college or university level of qualification	Young respondent living in the capital of the state, having no children yet. higher Hers/his qualification or work is not joining to the food chain	Elder small town or village resident, with college or university qualification, not joining to the food production; or town dweller with small children	Respondent with at least accomplished high school, elder (45+), living in small town or village, with an above average income level
The safest sources of food procurement	own-produced fruits and vegetables (4,11); meat of own-fattened animals (3,97) biomarket, bio-shop (3.92)	own-produced fruits and vegetables (4.15); expensive restaurants (4.08) super-and hypermarkets (3.85)	sown-produced fruits and vegetables (3,90); expensive restaurants (3.87) super-and hypermarket (3.68)	own-grown fruits and vegetables (4.37); meat of own-fattened animals (4.02) biomarket, bio-shop (3,80)	high –level restaurant (4,14) bio-market, bio-shop (4,05); own-grown fruit or vegetable (4,00)
The most risky sources of food procurement	Salad-bar, (2,94) moving vendor (2,45) street corner snack bar (2,17)	Agricultural producer on the market (2,64) moving vendor (2,10) street corner snack bar (1,86)	exotic restaurants (2,87) moving vendor (2,27) street corner snack bar (2,17)	exotic restaurants (2,78) moving vendor (2,11) street corner snack bar (1,88)	salad-bar, (2.83) street corner snack bar (2,28) moving vendor (1,88)
The most important food product attributes	shelf life (4.57) price (4,42) organoleptic value (4,41)	shelf life (4.84); readability of food label (4.65) organoleptic value (4,57)	price (4,29) shelf life (4.15); price (4,12)	shelf life (4.79); price (4,35) readability of the food label (4.32)	shelf life (4.79); price (4,44); readability of the food label (4,36)

	Phantasy –names of the segments				
	Unsure curious	Optimistic technocrat	Indifferent	Distrustful curious	Conservative cautious
Share (%)	38	5	12	27	18
The less important food –product-related attributes	bioproduct (3,20) energy content (3,18) TV promotion(2,48)	brand name (3,27) bio product (3,17) TV promotion (2,32)	aesthetic packaging (3,32) bioproduct (2,95) TV promotion (2,80)	aesthetic packaging (2,93) brand name (2.78) TV promotion (1,99)	energy content (3,27) aestetic packaging (3,19) TV promotion (2,50)
Attitude to the food labels	Each ingredients should be indicated even when they are not understandable to the consumers	Each ingredients should be indicated; this is not confusing to the consumer	The indication of the ingredients has not too much importance, but they do not disturb the consumers	Each ingredients should be indicated; this is not confusing to the consumer shelf life	The indication of every and each ingradients is of primary importance. For him/her the information dumping is not disturbing
The most important food-related risks	chemical residuals from environmental production (4.52) agro-chemical residuals (4.42) mildew and micotoxins (4.23)	chemical residuals from environmental production (4.69) mildew and micotoxins (4.55) microorganisms (4.46)	agro-chemical residuals (4.25) chemical residuals from environmental production (4.17) residuals of natural toxicants (4.15)	agro-chemical residuals (4.78) antibiotic residuals in meat or milk (4.17)	chemical residuals from environmental production (4.79) mildew and micotoxins (4.68)
Main sources of food safety related knowledge	TV(3,52) domestic experiences (3.30)	university, college studies (3.75) social life (3.00)	domestic experiences (3.50) TV (3,38)	social life (3.70) studies in the secondary schools (3.40)	university, college studies (3.40) domestic experiences (3.32)

5. Discussion

The H$_1$ hypothesis has been proven: there are well-defined patterns toward food safety regarding Hungarian consumers' attitudes.

From these attitude-systems a rather well-defined consumer profile could be developed. Moreover, the H$_2$ hypothesis can be considered as proven. In this regard, there is potential to communicate effectively with different groups of consumers. The major communication focus for food safety should be multi-faceted and geared toward different groups of consumers. These are as follows:

1. *unsure curious consumers*-to supply reliable information on a given firm, coupled with a scientific approach that emphasises the ill-founded nature of some current and fashionable theories of health and food safety;
2. *optimistic technocrat*s-to strengthen this consumer type's optimism, at the same time stressing the potential threats of food consumption
3. *indifferents*-accentuating the importance of food safety, via media utilised by these consumers;
4. *distrustful consumers*-greater attention on communication and reliability
5. *conservative cautious consumers*- stressing the impact of region of origin in dealing with this group of consumers.

One can consider the H$_3$ hypothesis as proven. The Fishbein-Ajzen model seems appropriate to evaluate consumer behaviour. After applying the Fishbein-Ajzen theorem, one observes the importance of the family in food safety education.

Attitudes and perceived control equally influenced consumer behaviour. The role of norms was especially high. Interestingly, parental influence had a higher than average impact. We were not able to prove a significant relationship between the attitudes, control and norms. This can be attributed to the rather low number of respondents.

Moreover, the school's role in food safety education seemed to be limited, and did not play a significant role. This reveals the relatively low level of food safety education in Hungarian schools. This fact is especially significant because if both parents work and grandparents are absent, in the future the importance of family/home education will diminish.

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A review of traditional Hungarian products' reputation with a special focus on consumer behaviour

Anett Popovics[1]

Abstract

The quality of traditional and regional products is essentially determined by geography, history and culture. Being protected by a distinctive quality label (based on the geographical origin, traditions and special features) may enhance traditional Hungarian and regional products' competitiveness.

Based on our survey's questionnaire results (N = 425) (basic statistics, factor and cluster analysis) it can be proved that consumers are able to identify and appreciate Hungarian products. They also highly value traditional quality.

Key words

traditional Hungarian products, consumer survey, reputation, value added

Introduction

Since 1st May 2004 when Hungary joined the European Union, Hungarian agricultural products have no longer enjoyed a protected local market. As the EU is the most important producer and consumer of processed food, Hungarian agricultural products have to compete with those products from other EU countries. Only by having the highest quality products can Hungary compete in the saturated EU market. However, traditional Hungarian products just might possess the necessary quality standard to do so.

In our research we began by describing traditional Hungarian food as a concept and subsequently by probing consumers' behaviour in terms of traditional products.

1. Hungaricum

In everyday parlance, the word "hungaricum" has again become a fashionable word. In numerous contexts it is used by people and experts, but its exact meaning has not yet been established.

There is no officially accepted definition for the proper use of this word. Every Hungarian knows that it not only refers to food, but also has a broader meaning related to Hungary and Hungarian traditions. Andrásfalvy (2003) offers a useful agribusiness definition:

'Hungaricum can be a plant, or an animal itself, but also a processed product made of that which is associated with Hungarian production culture, know-how, and Hungarian traditions, and which is accepted as typical of Hungary both by inhabitants and foreigners.'

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Based on the above, it is noteworthy that Hungaricum is not the proper word to use when examining consumer behavior toward traditional products.

2.   Regional products

In contrast to the 'Hungaricum' concept, the term 'regional product' refers only to agricultural products and foodstuffs. According to Ittersum (2002) a regional product is one with a quality and a reputation originating from the specific region and its market entry is highly influenced by the the region's name.

An EU regional product's quality features are clearly defined and they are also accepted by Hungarian regulations. Regional products must differ from standard products from the same market. Based on the above definition, regional products can be distinguished from standard products if they have clearly measurable attributes and if these attributes are obvious to consumers (Kisérdi – Palló, 2003).

The other parameter for establishing regional products' protection is *typical traits* meaning the particular value enhanced by the region and by the region's specific human factors which is intrinsic to the product. Due to this synergic effect it also has an additional cultural value (Casablanca – De Sainte Marie, 1997). Based on these two criteria, it is possible to determine regionality as a parameter. Tregear (1999) contends that when accepting a product as regional, its physical and cognitive psychological caracteristics should mesh with a sense of of traditon.

To preserve regional products' additional value and to protect their special identity from being illegally assumed by other parties, and to help consumers in gathering product information, the EU passed the Council Regulation (EEC) 2081/92 on the protection of geographical indications and the place of origin for agricultural products and food. However, in 2006 this was set aside by the new Council Regulation (EC) No. 510/2006. Those agricultural products and foodstuffs come under Council Regulation ruling (EC) No. 510/2006 where there is a relationship between the product itself (its features) and its origin (EC No. 510/2006).

The regulation contributes to diversification in agricultural production, which is also a rural development policy objective. It gives preference to the rural economy and also furthers increasing farmers' income and maintaining the rural population (Strossová, 2006).

The regions have other important roles as Kovács (2004) points out: "...the region itself is not only a physical place, but a concept having spiritual aspects as well. In many cases the traditional culture, the national identity or the authentic way of life may also define the relationship with the region".

For consumers the EU regulations were also essential: generally speaking, when selecting a product, consumers value quality over quantity.

According to some international studies the demand for specific products is generating increased demand for agricultural and food industry products of which the origin is definite and certified. (Kisérdi – Palló, 2003).

Given that on the market there are numerous similar products and a barrage of information, it is important that consumers have the necessary information on product origin.

EU regulations provide protection against copying, fakery, and unauthorized appropriation of rights: 'The designation of origin or the geographical indication shall not be registered if – considering the good reputation of a certain trademark and the period of time it has been used for – the registration might mislead the consumers' (EC No. 510/2006).

3. Specific (traditional) quality

Council Regulation (EEC) 2082/92 and a new Council Regulation (EC) No. 509/2006 declared the certification of specific caracteristics and created the 'Traditional Special Product' concept.

As previously mentioned, there is a wealth of cheap products and information and in order to arouse consumer interest, one must conduct a brief yet extensive information campaign. This should be beamed via the appropriate channels to establish the products' unique quality.

Council Regulation EC No. 509/2006 outlines how to protect given traditional agricultural products and foods and procedures related to this. To further provide protection specific traditional products need to be registered. This registration should provide information to companies and to consumers. 'The registered labels are protected against any practice aiming to mislead the consumer (EC) No. 509/2006)'.

Definitions applied by Regulation (EC) No 509/2006 are the following:
a) 'specific characteristic' means the characteristic or set of characteristics which clearly distinguishes an agricultural product or a certain food from other products or foodstuffs of the same category;
b) 'traditional' means the product which has been on the market for the required period of time for the product presented to the next generation; this period of time usually means usually a period of one generation, but at least 25 years;
c) 'traditional special product' means a traditional agricultural product or food having a specific characteristic recognised by the EC in accordance with the registration of this regulation.

4. Traditions – Tastes – Regions program

The Traditions – Tastes – Regions (in abbreviated form HÍR) was a national Hungarian initiative aiming to identify and assemble traditional Hungarian and regional foodstuffs and to improve their competitiveness.

In 1998 the Ministry of Agriculture and Rural Development (MARD) entrusted the Hungarian Community Agricultural Marketing Centre (AMC) with implementing the program in Hungary. This included the organisation of data collection, product description evaluation, and database maintenance.

From this program came two published volumes containing 300 traditional and regional products (excluding wines and recipes); the HÍR trademark was registered by the Hungarian Patent Office. Also the volumes were made into a CD with versions in Hungarian, English, and German, which is marketed by the AMC (Kisérdi-Palló, 2003).

In Tregear's (1999) theory on physical and psychological cognition, the consumer is influenced by two different factors: first come product related factors (name, appearance, packaging and trademark), but when actually buying the product various psychological subconscious factors influence the consumer such as tradition, habits, knowledge and experience.

Our main question is the impact of such psychological factors as product origin when buying traditional Hungarian goods. Moreover, what do customers consider a traditional Hungarian product?

In our study, the focus was on local characteristics and Hungarian consumers' opinion on buying traditional Hungarian products. The reason for this focus is related to Hungary's economic objectives. In order for traditional Hungarian products to preserve their competitveness on the overstocked EU market, the government aimed to protect the local market and domestic products. For the sake of clarity, when presenting our results we will use the terms 'traditional product' and 'traditional Hungarian product'.

Material and Methods

The consumer survey's samplings were based on an arbitrary selection, which were not representative. Therefore the data are diagnostic, and limit the scope of interpretation.

During the Foodapest exhibition at the Hungarian Community Agricultural Marketing Centre's stand interviewers completed the questionnaires. Using the Microsoft Excel and SPSS 10.0 statistical software package, 425 questionnaires containing valuable data were processed

On Table 1 is the distribution of the sampled persons (N = 425).

Table 1

The distribution of the sampled persons

Sex	
male	30.6%
female	63.1%
Age	
18-24 years	23%
25-34 years	21%
35-44 years	15%
45-59 years	27%
60-74 years	7%
more than 74 years	1%
Place of living	
Budapest	29%
other big city	34%
smaller town	15%
village	16%
Education	
higher education	47%
high-school graduation	39%
skilled worker	6%
pimary school	3%

Source: own research

Using factor analysis, we analysed the relationship based on the correlation between the variables, meaning we strived to uncover those groups of variables relating to each other. We determined the number of factors defining the own values. As the own value expresses the variance of a certain factor itself, only those factors were included in the model whose own value was bigger than one (Malhotra, 2001).

To interpret those factors, we had to apply the transformation method of orthogonal rotation, and within that we applied varimax procedure. For the factor analysis we used SPSS 10.0 statistical software.

Table 3 and Table 4 show the results of the rotated factor matrix.

In the Appendix there is information about the significance of the T-test values which includes two samples, and there is also information regarding the variance analysis. We set up independent hypotheses which don't exclude each other.

Results

Hypothesis 1: Consumers are able to define the concept of a traditional Hungarian product and able to place it in time and space.

In the first part of our questionaire we wished to know what a traditional Hungarian product means to consumers? Figure 1 shows the result.

Figure 1

Defining the traditional Hungarian product (reference%)
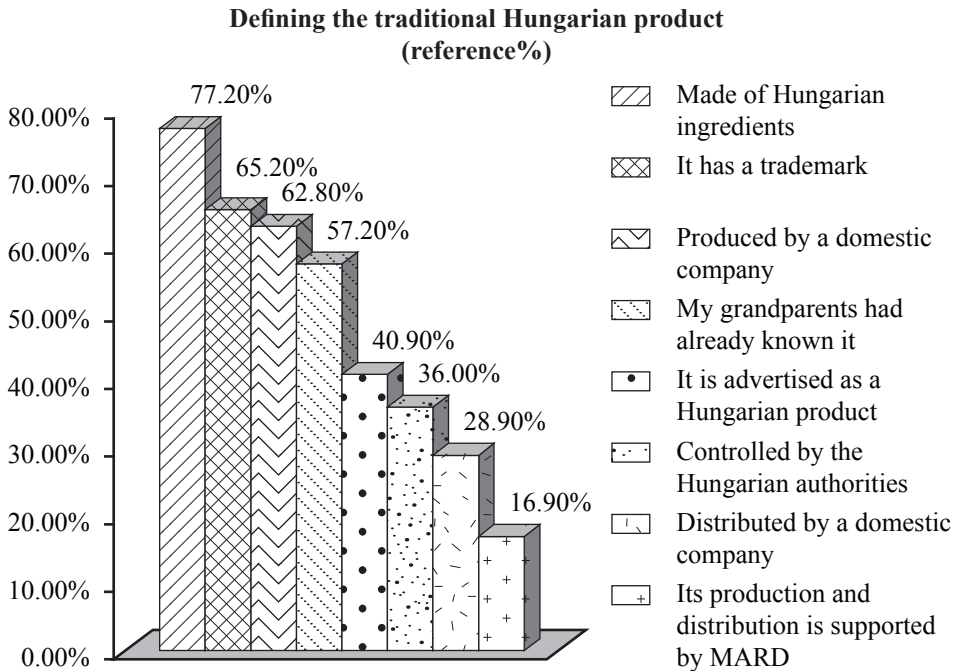
Source: own research

It can be seen in Figure 1 that consumers are able to place the concept of traditional Hungarian product both in terms of time and space (heritage and location). Based on this, dimensions of space and time can be clearly separated. (''Made of Hungarian ingredients = space'', ''My grandparents had already known it = time''). As a third dimension, culture is closely connected to a given region and to the time dimension because, rather than simply capitalizing on existing opportunities, production also requires tradition and know-how.

It proved important to highlight the importance of registered trademark, which comes second on the list of factors determining a traditional product's parameters. The system of certification protecting food origin and traditional specific characteristics has been created to further the quality of European agricultural products and food. It also serves to increase their competitiveness and and to provide more specific information to customers.

Both the previously mentioned EU regulations determine and introduce three different kinds of trademarks. These are protected designation of origin (PDO), protected geographical indications (PGI), traditional specific product (TSP). These help consumers find better quality and outstanding product features (FVM – AMC, 2004).

Hypothesis 2: Hungarian consumers seek out traditional Hungarian products and often buy them. Rural people consume more traditional products than city dwellers.

According to consumers, traditional Hungarian products are of superior quality and are more expensive than foreign products.

Figure 2

Frequency of consuming traditional Hungarian products

⊠	no answer
⊡	daily
⊿	weekly
⧄	monthly
⊡	rarely
⊠	never
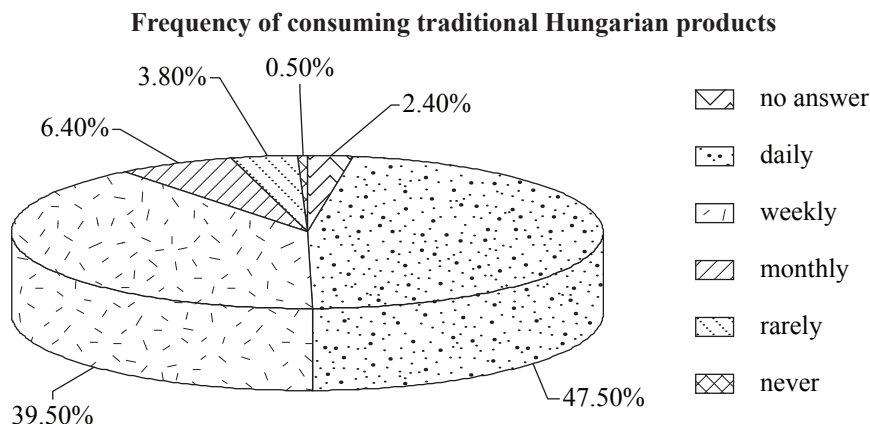
Source: own research

On a daily or weekly basis, Hungarian consumers buy those products identified as traditional Hungarian. According to Tolvéth (2005) there is a relationship between purchasing frequency and purchase location.

Once a week to save time they shop in a supermarket or hypermarket, and this becomes a new habit. However, what matters is the variety of traditional Hungarian products which can be found on the shop shelves. Probably these products are more limited in supply, and are more available in smaller shops and in a market-halls. A further objective is to estimate traditional Hungarian products' supply in hypermarkets and supermarkets.

It can be generally stated that the consumption of Hungarian products is not related to a consumer's age. However, extreme values were found among 18-24 and 25-34 year olds as among them there was a trend toward less frequent consumption of Hungarian products. Our hypothesis was not supported by the statistical results: country people do not consume more often traditional Hungarian products. The daily consumption of these products is higher among those living in bigger towns and cities.

According to 38.1% of people the quality of Hungarian products matches the quality of the foreign products. 6.4% of them said that it was worse and 41.9% answered that it was better.

The answer to the question on the quality of Hungarian products versus the quality of foreign products is independent of one's sex, age and place of residence. However, people with a higher education prefer traditional Hungarian products compared to people with only primary school education.

We have a "symmetrical" answer for the question related to the price of Hungarian food: 23% of respondents thought the prices were generally the same. 35-35% of them answered that the price was lower or higher and 2-2% thought it much lower or much higher. One can thus draw the same conclusions as those based on Tolvéth's (2005) research where the following answers were given for the same question: 60% of respondents felt Hungarian products to be of better quality and 54.1% felt Hungarian products were more expensive than the imported products.

Hungarian customers are therefore seeking traditional products, and consider them to be of higher quality. However, consumers' price sensitivity may explain why they choose foreign products over Hungarian ones, and one can only hope this tendency doesn't strengthen and, for the same product, the gap in prices between Hungarian and foreign goods narrow. In order that people permanently consume these products a reliable supply is required.

By using SWOT analysis, Lakner-Szabó (2004) examined the potential of those traditional Hungarian product's included in the HÍR collection (Traditions – Tastes – Regions program). Due to traditional goods' unique character, the two researchers thought that selling them might prove profitable and that, due to consumer interest, marketing them could be pursued. However, other than their unique nature, they were not sure of the products long-term competitiveness.

As regards sex and age, there is no difference in price sensitivity. More highly educated people consider traditional Hungarian products to be more expensive while most Budapest residents think Hungarian products are cheaper than imported goods.

Hypothesis 3: When examining a consumer's decision making process, origin and traditional features are more important when buying traditional Hungarian products than for other products. Consumers appreciate the value added by the traditional features and they are willing to pay more for these products.

Pursuing this hypothesis we asked the consumers to evaluate separately the importance of 12 parameters when buying food in general and when buying traditional Hungarian products. The 12 parameters were: habit, taste, price, packaging, smell, brand, Hungarian origin, place of origin (region), traditional features, advertising, availability and trademark on the package. The importance of the various factors were evaluated on a 5 degree scale with the following extreme values: 1 = absolutely not important, 5 = very important. The statistical results can be seen in Table 2.

Table 2

Statistical parameters of product characteristics valued by scores of responders, in case of buying foodstuffs versus traditional Hungarian products

Statistical parameters of scores in case of buying foodstuffs (N = 425)				Statistical parameters of scores in case of buying traditional products (N = 425)			
Caracteristics	**mean**	**mode**	**standard deviation**	**Caracteristics**	**mean**	**mode**	**standard deviation**
Habit	3.05	4	1.71	**Habit**	2.94	5	1.90
Taste	3.95	5	1.69	**Taste**	3.68	5	1.91
Smell	3.51	5	1.71	**Smell**	3.38	5	1.86
Price	3.36	4	1.61	**Price**	2.99	3	1.71
Packaging	2.80	3	1.48	**Packaging**	2.54	3	1.60
Origin	3.33	5	1.70	**Origin**	3.31	5	1.90
Place of origin	3.02	4	1.67	**Place of origin**	3.13	5	1.86
Traditional features	3.00	4	1.63	**Traditional features**	3.26	5	1.85
Brand	2.88	3	1.59	**Brand**	2.91	5	1.79
Advertisement	2.02	1	1.34	**Advertisement**	1.90	3	1.39
Availability	3.08	4	1.64	**Availability**	2.68	4	1.73
Trademark	2.96	3	1.64	**Trademark**	2.89	5	1.83

Source: own research

To explore the variables and the demographical relationships we applied t-tests with 2 samples and we found the following results: when buying food the consumer's age is important for the following parameters: habit, taste, smell, packaging, origin, place of origin, traditional features, brand, availability and trademark on the package. It has no relationship with price and advertising.

When buying traditional food the consumer's age is significant for the following parameters: taste, smell, price, packaging, origin, place of origin, traditional feature, brand, availability and trademark on the package. It has no relationship with habits and advertising.

After examining the previous hypothesis results indicated the same both in the case of buying food and in the case of buying traditional food:

- Habits have a smaller influence in the 18-24 age group and in the 60-74 age group, but have a stronger influence in the 25-59 group.
- Taste and smell have a significant influence in every age group, except in the 60-74 group.
- For those above 60 price is also highly important.
- Regarding origin, place of origin,and traditional features there is no significant deviation between the different age groups.
- Young people are strongly influenced by advertising, while availability and the package trademark are more important to the older respondents.
- From variance analysis we conclude that there is at least one subgroup whose average significantly differs from the mean of other groups: this is the group of

people above 74 (remark: for 1-2 parameters this can also be found for the 18-24 and 60-74 age groups).

Lehota (2006) states that consumers do not have all information when making a purchase decision. Cognition of a product's characteristics also depends on the type information available. Based on that the product characteristics can be defined as follows:
- 'characteristics based on the information seeking process'
- 'characteristics based on empirical advantage'
- 'characteristics based on inherent trustworthy product components'

On focusing on the origin and traditional features, our research results were the same factors as above. Table 3 and Table 4 show the results of the rotated factormatrix.

Table 3

Factor weights of caracteristics from the rotated factor matrix of buying foodstuffs

Caracteristics	1st factor	2nd factor	3rd factor
PLACE OF ORIGIN	**0.829**	0.269	0.278
ORIGIN	**0.829**	0.273	0.321
TRADITIONAL FEATURES	**0.688**	0.381	0.265
TRADEMARK ON THE PACKAGE	**0.540**	0.428	0.358
ADVERTISEMENT	0.244	**0.663**	0.200
AVAILABILITY	0.320	**0.663**	0.355
PACKAGING	0.393	**0.601**	0.363
BRAND	0.435	**0.560**	0.307
TASTE	0.421	0.374	**0.773**
SMELL	0.408	0.295	**0.773**
PRICE	0.288	0.536	**0.563**
HABIT	0.192	0.471	**0.480**

KMO = 0.938 Bartlett Approx. Chi-Square = 3929.448 Sig = 0.000
Rotation Suns of Squared Loadings (%) = 68.466 Maximum likelihood, varimax
Source: own research

Factor weights of caracteristics from the rotated factor matrix of buying traditional products

	1st Factor	2nd Factor	3rd Factor
Packaging	**0.716**	0.370	0.290
Availability	**0.700**	0.342	0.316
Price	**0.681**	0.282	0.487
Advertisement	**0.669**	0.308	0.213
Brand	**0.554**	0.512	0.356
Habit	**0.480**	0.319	0.425
Pace of origin	0.386	**0.777**	0.349
Traditional features	0.402	**0.661**	0.475
Origin	0.457	**0.657**	0.417
Trademark on the package	0.520	**0.541**	0.347
Taste	0.385	0.435	**0.814**
Smell	0.383	0.477	**0.659**

KMO = 0.946 Bartlett Approx. Chi-Square = 5136.958 Sig = 0.000
Rotation Suns of Squared Loadings (%) = 75.165 Maximum likelihood, varimax
Source: own research

There is an obvious relationship among the 'inherent trustworthy product components': place of origin, origin and traditional features. The trademark on the packaging is connected to these parameters. The importance attributed to a trademark indicates that consumers want to be sure that the place of origin is truly traditional and the best way to achieve this is a trademark or logo showing geographical origin. This is one way to reduce the risk to which consumers are exposed (Lehota, 2006).

The second factor covers those advantages related to 'information seeking'. The following features are part of this category: availability, packaging, brand and advertising.

The third group contains the 'empirical advantages'. Besides taste and smell, price also belongs here and this may reflect Hungarian consumers' strong price sensitivity.

Price and shopping habits reveal a relationship with the 'information seeking' process advantages. When buying traditional products, price and product familiarity are important. This might indicate that it is quite difficult to market one regional product in another region, especially if the products are significantly different.

Hypothesis 4: By forming consumer groups we can create one or more target groups which might prove important toward buying traditional Hungarian products and, following purchasing process parameters, certain marketing tools can be allocated to them.

In addition to the factor analysis we also applied cluster analysis. Rather than using only factor analysis, in order to decrease the number of consumers by sorting them into fewer clusters, we also applied cluster analysis.

Our aim was to organize the observed units into relatively homogenous groups based on the selected variables. We searched for those clusters whose elements are similar to each other, but they differ from other culsters' elements. We applied Euclidean distance to define similarity or difference and the method was non-hierarchical K-mean cluster analysis. Table 5 shows the results of this cluster analysis.

Table 5

Results of the cluster analysis

Order and name of cluster	1st Cluster	2nd Cluster	3rd Cluster
	Exacting and conscious consumers	**Rambling consumers influenced by advertisements**	**Consumers preferring traditions and high quality**
No. of persons (N)	139 capita	79 capita	131 capita
Caracteristics of clusters	Products arealways overvalued	Products are over and undervalued with a changing frequency	Products are usually undervalued
	The parameters related to the place of origin are also overvalued	The parameters related to the place of origin' is undervalued!	The parameters related to the place of origin is extremly overvalued!
	The number of females within this group is outstanding (77%)	The ratio of the males and females is the same asin the sample (40-60%)	The ratio of the males and females is the same asin the sample (40-60%)
	Mailnly elderly, married pairs belong to this group	Mainly young married pairs, families with young children belong to this group	Mainly elderly people or the average distribution
	They think a bigger percantage of the Hungarian products have a better quality than the foreign products have	They think a bigger percantage of the Hungarian products have a lower quality than the foreign products have	They think a bigger percantage of the Hungarian products have a better quality than the foreign products have
	They think the prices of the Hungarian products are lower than that of the foreign products	Most of them think the prices of the Hungarian products equal to the prices of the foreign products	They think the prices of the Hungarian products are higher than that of the foreign products
	They consume Hungarian products every day	They consume Hungarian products every week	They consume Hungarian products every week

Remark: The certain clusters were described on the basis of the significant deviations of the clusters full mean sample.
Source: own research

When marketing traditional Hungarian goods consumers belonging to the first cluster can be a highlighted target group, as they appreciate the place of origin and they are ready to pay more for this additional value. The marketing tools proposed are: sales promotion and reduced prices at the purchase location. The third cluster is inconsistent as the consumers value the traditional features and origin, but probably this is only due to 'nostalgic feelings' felt by elderly people. Accepting the second cluster as a target group might also prove correct despite the responses, but it is deemed advisable to change certain marketing-mix elements as the members of this group are young people who are more susceptible to advertising and special event promotions.

Conclusions

Our research is a non-representative one, and therefore it provides only diagnostic-type results.

Basically all of our four hypotheses proved correct.

H1: Consumers are able to define a traditional Hungarian product, and they can place it in time and space and also connect it to a third dimension, meaning culture.

H2: Consumers are seeking and buying traditional Hungarian products, which they consider of superior quality, but the highlighted target group thinks those products are cheaper. Rural area residents do not consume traditional Hungarian products more frequently, and daily consumption of these products is higher among urban residents.

H3: Consumers appreciate the value added by the traditional features.

H4: We managed to create separate target groups and to determine their characteristics.

To sum up one can state that consumers are sensitive to traditional Hungarian products' additional value and, on the overstocked EU market, these products can thus obtain a competitive advantage. Obtaining collective trademarks might help in cementing these advantages, but priority should be placed on providing producers and potential producers information. Then products and trademarks can be widely marketed by establishing the proper marketing-mix. As traditional products form a part of our cultural and agricultural heritage, collective marketing tools should be applied while focusing on the target groups.

The results also indicate that in the saturated EU market, competitive advantage can be achieved only through our domestic products' special features (the value added). Therefore highlighting the traditional nature of our innovative products is an optimum way to capitalize on our research results.

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Acknowledgement

Appendix I.

Significance of relations between product caracteristics and ages of responders

Scaled question	Value of significance*
In case of buying foodstuff	
Habit	0.004
Taste	0.000
Smell	0.000
Packaging	0.002
Origin	0.001
Place of origin	0.000
Traditional features	0.000
Brand	0.003
Availability	0.002
Trademark on the package	0.000
In case of buying traditional products	
Taste	0.000
Smell	0.002
Price	0.001
Packaging	0.001
Origin	0.000
Place of origin	0.000
Traditional features	0.001
Brand	0.003
Availability	0.002
Trademark on the package	0.000

*Note: Values < 0.005 are significant.
Source: own research

Efficiency and total factor productivity in post-EU accession Hungarian sugar beet production

József Fogarasi[1]

Abstract

This paper analyses efficiency and total factor productivity (TFP) in Hungarian sugar beet production applying non-parametric frontier techniques. For 2004 and 2005 efficiency and TFP are calculated by Data Envelopment Analysis (DEA) and by a Malmquist index respectively. Betwee 2004 and 2005 the average technical efficiency wasvery stable, around 0.80 for CRS efficiency and 0.87 for VRS efficiency, suggesting that in both years farms were similarly clustered towards the frontier. The analysis of returns to scale reveals that during both years half (48%) of the sugar beet growers were operating under increasing returns to scale. In the two analysed years changes occurred between decreasing returns to scale and scale efficient farms, when the first increased from 32% to 37%, while the second decreased from 20% to 15%. In 2004 the highest technical efficiency can be observed in Szerencs district followed by Kaba district and then Szolnok district, while the efficiency rating changed in 2005 when the most efficient district was Kaposvár, followed by Szerencs and Petőháza.

Between years TFP increased by 9%. The main reason for the observed TFP increase was technical progress of 8%, while technical efficiency played a limited role in improving the performance of sugar beet production. At the same time there was a clear convergence which can be identified and thus improving efficiency scores among individual holdings. Although in the analysed period TFP increased, our empirical results have revealed pure technical inefficiency. In the first three most efficient sugar beet production districts the technical efficiency decreased while in the two least efficient districts technical efficiency increased and they became more homogenous to the frontier compared to the former three districts in 2005.

Key words

Efficiency, TFP, Data Envelopment Analysis, Sugar beet production, FADN.

1. Introduction

The aim of this article is to analyse efficiency and productivity in Hungarian sugar beet production in the first two years after EU accession. This is carried out after taking into account reform in the sugar regime driven by an institutional price cut and slight trade liberalisation, which should encourage beet producers to improve efficiency. Many studies have analysed the total factor productivity of Hungarian agriculture. These include Hughes (1998), Banse et al., (1999), Mathijs and Vranken (2000), Mathijs and Vranken (2001), Daviova et. al (2002), respectively Mathijs and Noev (2002) analysed the total factor productivity of Hungarian agriculture. These articles explore efficiency and productivity, especially in Hungarian argriculture's main sectors (crops and livestock). In the literature there are however no studies regarding the efficiency and productivity of Hungarian sugar beet or other agricultural goods production. Curtiss (2002), however, argued that industriousness and market arrangements may vary from production to production, and therefore may influence the specific efficiency scores.

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After accession sugar beet producers faced a different policy which led to higher profitability than for other Common Agricultural Policy (CAP) agricultural activities. This article scrutinizes policy change consequences on sugar beet producers' performance. Based on Data Envelopment Analysis, this is done by using a panel of 54 Hungarian sugar beet growers in the first two years after accession. The following questions are analyzed empirically:

Have sugar market regulation changes influenced the performance of sugar beet producers?

Due to an absence of competition, one can expect there to be inefficient sugar beet growers. This is because distribution quotas determine a guaranteed high price for sugar beet and purchase of output. In inefficient sugar beet operations, the degree of inefficiency reveals the potential for improvement in the use of factors. To predict future trends in sugar beet production, a decrease or increase in efficiency is important.

Which producers will survive in a more market oriented environment?

This question is examined according to production districts. Future sugar beet production utterly depends on the sugar beet processing factories decision to continue production or not. Through greater compensation in the intitial Common Market Organization (CMO) reform, these factories are encouraged to close down. In subsequent years this compensation will diminish.

Our assumption is that, in the future, the most technically efficient and prosperous total factor productivity districts will continue sugar beet production.
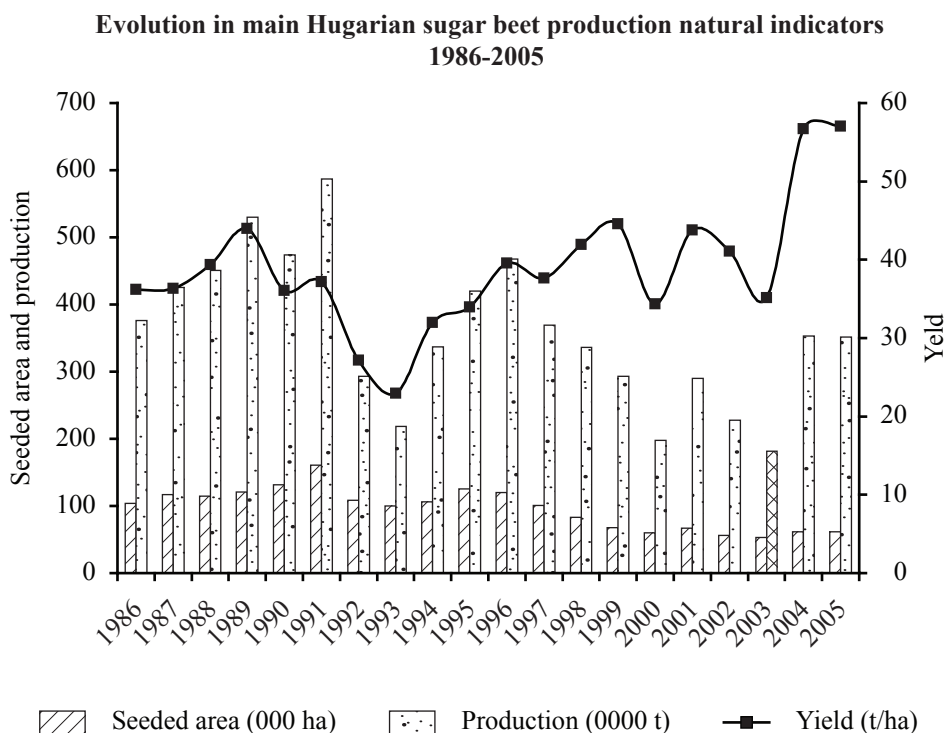
The paper is organized as follows. The next section provides a short overview of trends in Hungarian sugar and sugar beet production. Reference is made to international sugar market trends as well as reform of the EU sugar market structure. The third section details the methodology, and the fourth section describes the data sets. Results are presented in section 5 and in section 6 the article offers conclusions.

2. Trends in sugar beet production

2.1. Overview of sugar beet and sugar production

In the two years after EU accession Hungarian sugar beet production was limited by EU sugar quotas and stabilised at 3.52 million tonnes. The crop was produced on nearly 62 thousand hectares with an average yield of 57 tonnes per hectare. After a 1991 peak of 5.87 million tonnes, in the last fifteen years sugar beet production declined and fell to almost 2 million tonnes in the pre-accession years. (Figure 1). The 1991 peak was obtained on 161 thousand hectares of seeded area yielding 37.16 tonnes per hectare. This means that in the event of abolition of the production quota or dispersal of the existing quota among member states, Hungarian sugar beet production can increase as long as sugar beet growers are more efficient than their competitors.

Figure 1

Evolution in main Hugarian sugar beet production natural indicators 1986-2005

Seeded area (000 ha)   Production (0000 t)   Yield (t/ha)

Source: Hungarian Central Statistical Office (2006).

In the two years after EU accession Hungarian crop producers faced increasing input costs, and changes in producer prices, but also received higher subsidies (Potori and Udovecz, 2005). Compared to the pre-accession period, sugar beet producers' income has increased almost tenfold, this stemming from the CMO sugar policy. For example, in the case of sugar raw material, the minimum price for sugar beet has been increased. After the CMO sugar reform, this income is estimated to decrease, but will remain double or triple that of the pre-accession period. According to Csillag and Fogarasi (2005), if there are no changes in technology and input costs, compared to 2004 only 35% of Hungarian sugar beet can be produced. In 2004 the estimated sugar beet price was € 25.05 per tonne minimum. However, for three reasons this sharp decline in sugar beet production will not occur. Firstly, because the minimum price reduction will occur in two steps, allowing farmers to more easily adjust their production to new market conditions. Secondly, short-term production decisions are based on variable costs, and thirdly the Hungarian currency has depreciated against the Euro, which in the short term has resulted in a higher price for sugar beet.

During the transition to a market economy and subsequent preparation for EU accession, the sugar industry became more highly concentrated. This was due to privatization of existing capacities and an opening to foreign capital investors (Jansik, 2001). In this respect the number of sugar factories decreased while the capacity of remaining factories increased from 3,825 tonnes per day in 1989 to 7,400 tonnes per day in 2004.

In Hungary there are five sugar beet processing factories. Depending on the area, sugar beet is produced at different average costs and consequently the income per hectare varies between these areas. According to Fogarasi and Radóczné Kocsis (2005), the lowest per hectare sugar beet income was around Petőháza, where there was a Magyar Cukor Ltd.[2] Factory. In this area the institutionalized sugar beet price cut has been a significant burden for beet producers. Morevover, in coming years sugar companies' decisions will be of utmost importance regarding sugar beet production.

Compared to other agricultural products, world sugar prices have historically been characterised by a high degree of volatility. Since 1995, due to excess production, Berkum et al. (2005) confirmed the decreasing trend of sugar prices. Between 1980-2002 the annual growth rate for production and consumption was 2.5% and 1.9% respectively (EC, 2006). After the CMO sugar reform, the EU-27 sugar price is approaching world price, but the difference will still remain high until 2009/2010 when bilateral trade agreements become effective and preferential imports of sugar at world price are allowed in the common market.

Analysing global sugar consumption, Csillag (2005) concluded that at the international level further increases in demand for sugar can be expected. Due to increasing world population and the processing level of food products, global sugar consumption increased from 60 million tonnes per year in the sixties to 130 million tonnes in 2005. Increases of up to 160 and 176 million tonnes are expected until 2010 and 2015 respectively. However, increasing sugar production was mainly because of sugar cane plantation expansion, while production from sugar beet stagnated. Cane sugar production increased from 56% in the sixties to 75% in 2005. Similar increases in sugar cane production cannot be sustained without further environmental damage. Moreover, after oil price increaes, it has become more profitable for the leading sugar exporter, Brazil, to produce sugar cane fuel instead of sugar. It is therefore expected that the proportion of sugar beet sugar will increase to meet world demand.

2.2. Policy overview

Not until 2006 were there important changes in CMO sugar policy, however, several critics and reform scenarios were formulated. In the first part of this section are presented several criticisms and reform proposals. In the second part are the main changes in CMO sugar policy. For many producers price differences are unfair. This is because beet producers in Ireland, Italy, the Netherlands and United Kingdom (UK) have received an average price for their sugar, regardless of the quota (A-, B- or sometimes C). On the other hand, producers in other countries have received a different price for the three types of sugar. Consumers have also complained about the high price of sugar in the EU and have shifted to other types of sweeteners, raising questions about the long-term sustainability of the regime.

Burou et al. (1996) suggested reforming the sugar regime by allowing quota transfers among EU member countries as well as among regions within the same country. They estimated how transferring cross-border quotas could influence production in various EU regions. They found that roughly 45% of production could be reallocated from Southern Europe and Benelux and then mainly directed towards France, Germany and Denmark. Moreover, substantial transfers could take place between producers in different regions within the same country.

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[2] Magyar Cukor Ltd is part of the Agrana Group, who own 36.36% of Hungarian sugar quota (147,137 tonnes), while the other two operators in this industry Nordzucker Group and Eastern Sugar Group are owner of 36.36% (146,452 tonnes) and 29.96% (108,093 tonnes) respectively of Hungarian sugar quota.

What cannot be accepted are defined quotas based on member states' administratively specified production efficiency level. Bozik and Izakovic (2004) have argued that investments in the Slovak sugar industry were large in the years preceding EU accession and have specified pertinent sugar factories. They concluded that the sugar beet producers' situation is following a similar course. They also have contended that, for Slovakia, until 2011 the projected economic ramifications due to the 'fall in prices' regarding EU sugar reform match pre-accession conditions.

Giha et al. (2006) estimate that even if there were a 40% reduction in sugar beet price, 52% of UK beet production would remain viable. However, farmers would need to reduce their average costs by 20%. If not, only less than 20% of sugar beet production could be attained. Giha and Renwick (2005a) established that the average cost reduction would not be due to farmers' operational changes but basically because high cost producers would simply cease sugar beet production. With respect to output changes, in the event of reduced UK prices Giha and Fenwick (2005b) submitted that the main replacement crop would likely to be winter wheat, then winter barley, oil seed rape and spring crops. For input usage they felt that reduced production would impact significantly on miscellaneous costs, meaning contract harvesting and haulers. Morever, usage of seed, fertiliser, spray and other variable inputs per hectare of sugar beet grown would reduce medium term costs.

Since July 2006, the European Commission has implemented reforms for the EU sugar regime. This is the first fundamental change in CMO sugar policy since its 1968 foundation. More specifically, the Council decided (I) a progressive cut in the EU white sugar reference price of up to 36% (i.e., about 41% of the sugar beet minimum price) over a period of four marketing years;.(II) Direct compensatory payments of 64.2% of the estimated revenue loss over three marketing years.. (III) A single quota arrangement for the period 2006/07-2014/15 (European Council, 2006).

These measures imply further productivity and efficiency improvement for beet growers enjoying a comparative advantage. Consequently they should produce more competitively in a market with lower institutional prices and slightly more free trade (Demont, 2006).

3. Methodology

In order to measure Hungarian sugar beet farmers' efficiency, this study employs Data Envelopment Analysis (DEA) An efficiency analysis of Hungarian wheat, maize, sunflower and pork sectors was performed by Varga (2006). DEA was used coupled with detailed presentation of this methodology. The following section describes the DEA method used in the empirical analysis. As an example, see studies by Lissitsa and Odening (2005), and Latruffe et al. (2005); for more detailed discussion see Coelli et al. (1998).

DEA creates a nonparametric frontier over data points and thus all observations lie on or below the frontier. This method has two alternative orientations, input and output. The input oriented model estimates the proportional decrease in the use of input as output remains unchanged, although slacks can allow nonproportional input changes (Coelli et al., 1998). The output oriented model measures the proportional increase in outputs that could be attained with constant inputs, with slacks providing information about nonproportional changes in outputs.

DEA is a deterministic method devoid of any assumption regarding the original data distribution. Deviation from an estimated frontier is interpreted purely as inefficiency.

DEA requires detailed data about inputs and outputs. The analysis can be performed at the activity or holding level and usually uses micro level accounting and statistical data, such as the Farm Accountancy Data Network (FADN). Activity analysis however requires separability of inputs by activity.

In this study DEA was chosen over the stochastic frontier analysis (SFA) for several reasons. First, it facilitates the split of total technical efficiency into pure technical efficiency and scale efficiency, as well as identifying farms that operate under increasing or decreasing returns to scale. Total technical efficiency is estimated assuming that farms have constant return to scale. (CRS). The term pure technical efficiency is used if returns to scale are assumed to be variable (VRS). Pure technical efficiency estimates the farmers' management abilities rather than farm size. Optimally sized farms can be identified through scale efficiency, meaning the residual ratio between CRS efficiency and VRS efficiency. Second, DEA does not necessitate specification of a functional form for the frontier as it uses linear programming. Third, multiple outputs and inputs can be considered simultaneously.

Table 1

Variables used in the efficiency analysis

Variables	Definitions
Output	
Sugar beet production	Metric tonnes
Inputs	
Labour	Working hours in sugar beet growing activity in the holding
Land	Seeded area of sugar beet in hectares
Capital	Amortisation of assets used for sugar beet production only
Variable inputs	Seeds, fertilisers, pesticides, fuel, paid services, other inputs used for sugar beet production only

In this article we utilise an input oriented DEA method with one output and four inputs. The inputs are labour, land, capital and variable inputs (as specified in Table 1) and this applies to the first two years following EU accession. The inputs expressed in HUF, namely capital and variable inputs, are deflated by the agricultural machinery investment price index (105.6) and the agricultural variable inputs price index (–0.7) at 2004 prices.

4. Data used

The empirical productivity and efficiency analyses are based on individual farm data from the Hungarian 2004 and 2005 FADN database. During both years a sample of 60 sugar beet grower-holdings was taken and, after excluding the farms with unrealistic figures, data from 54 farms per year were used. Extending the balanced panel data to previous years was not possible as it reduced the sample too much.

In Table 2, the basic characteristics of the sugar beet grower-holdings are presented. In 2005 the sugar beet production mean increased comparative to 2004 by 24.5%, while minimum production decreased by 36.8% and maximum production increased by 19.8%.

The labour production factor was based on beet growers' annual average working hours. The mean of labour utilised in sugar beet production increased by 13.6%, which was less than output increase, but at the same time minimum and maximum utilised labour decreased by 23.4% and 7.2% respectively.

The input land is measured in physical units (hectares). The mean of sugar beet seeded area grew by 4.2%, while the minimum and maximum decreased by 71.8% and 7.2% respectively.

Table 2

Descriptive input and output statistics for the analysed farms

	Total output (tonnes)	Labour (hours)	Land (hectare)	Capital (mil HUF)	Variable inputs (mil HUF)
2004					
Mean	2,766	1,779	56.64	1.15	13.19
SD	4,179	3,799	86.36	1.72	19.54
Min	95	94	4.11	0.01	0.57
Max	28,154	27,140	543.10	9.89	127.93
2005					
Mean	3,443	2,020	59.04	1.16	14.49
SD	5,888	3,641	88.27	2.29	20.70
Min	60	72	1.20	0.01	0.30
Max	33,724	25,190	504.10	15.71	128.89
2005/2004 %					
Mean	124.5	113.6	104.2	100.9	109.9
SD	140.9	95.8	102.2	133.1	105.9
Min	63.2	76.6	29.2	156.7	52.6
Max	119.8	92.8	92.8	161.7	100.8

SD: standard deviation; Min: minimum; Max: maximum; mil HUF: million Hungarian Forint.
Values in constant 2004 prices.
Source: Data from Hungarian FADN, 2004 and 2005.

The third capital input variable is approximated by reported depreciation. Efficiency results may be affected if the rate of investment of the farms differs, though this is unlikely for sugar beet production as the market is heavily regulated. The mean of capital in sugar beet production increased in real terms by 0.9%, while the minimum and maximum capital increased by 56.7% and 61.7% respectively.

The fourth production factor is variable inputs which includes seed, fertilizers, pesticides, fuel, paid services and other inputs expressed in real terms. The mean of variable inputs grew by 9.9%, while minimum and maximum decreased by 47.4% and 0.8% respectively.

5. Main findings

5.1. Analysis of technical efficiency

A direct efficiency comparison between different years is not possible. Lissitsa and Odening (2003) remind one that the efficiency values, meaning efficiency as a relative indicator, should be interpreted only with regard to the underlying sample. As seen in Table 3, the average technical efficiency was very stable between 2004 and 2005, around 0.80 for CRS efficiency and 0.87 for VRS efficiency, suggesting that farms are similarly clustered towards the frontier in both years. Just as they did in 2004, in 2005 farms employed homogeneous practices.

Table 3

Technical efficiency and scale efficiency summary
statistics in Hungarian sugar beet production

	Total technical efficiency	Pure technical efficiency	Scale efficiency
2004			
Mean	0.796	0.876	0.912
SD	0.159	0.133	0.131
Min	0.501	0.563	0.501
ShareMax (%)*	17	33	19
2005			
Mean	0.808	0.871	0.931
SD	0.161	0.144	0.114
Min	0.265	0.273	0.527
ShareMax (%)*	15	31	15

* ShareMax – Share of farms with efficiency score of 1.

For scale efficiency one sees a slight increase, meaning that sugar beet growers were more clustered towards the frontier in 2005 than in 2004.

The analysis of returns to scale (not presented here) reveals that in both years half (48%) of the sugar beet growers were operating under increasing returns to scale (IRS). IRS indicates that they are too small to be scale efficient even though these farms increased their size from 18 hectares to 22 hectares between 2004 and 2005. This coincides with Cooper et al. (1999) findings cited by Lissitsa and Odening (2005) that improving efficiency cannot be achieved through increasing the size, but only through rationalisation.

During the two years in question, changes occurred between decreasing returns to scale (DRS) and scale efficient (constant returns to scale, CRS) farms. The share of DRS farms increased from 32% to 37%, while scale efficient farms decreased from 20% to 15%. However, more than half of the farms (52%) didn't alter their status, position, remaining scale efficient, DRS or IRS efficient farms.

Table 4 presents the average slacks for each input for total technical efficiency. All slacks, except for capital, increased between the two years, but labour seems to be the most excessively used input. This means that, during the two years in question, at the 0.80 technical

efficiency scores all inputs can be reduced by 20% without decreasing output. Moreover, labour can be reduced a further 8% and 14% in 2004 and 2005 respectively without decreasing output. Morevoer, utilized capital can be also be further reduced by 6% and 2%, and variable inputs by 2% and 5% in 2004 and 2005 respectively. The former can occur without changing sugar beet output.

Table 4

Input slacks on total technical efficiency in Hungarian sugar beet production

	Land (hectares)	Labour (hours)	Capital (1000 HUF)	Variable inputs (1000 HUF)
2004	0.61	111	79.81	255.90
2005	1.01	215	31.61	660.73
%				
2004	0.58	7.87	5.74	1.48
2005	0.90	14.09	2.10	4.81

5.2. Changes in total factor productivity

In Table 5 are changes in average *total factor productivity* (TFP) for the studied sugar beet farms between 2004 and 2005. Column 1 indicates that the Malmquest Productivity Index (MPI) amounts to 1.087, meaning the TFP increased by almost 9%; this also shows that the TFP scores decreased for 35.2% and increased for 64.8% of sugar beet growers.

The average MPI greater than 1 can essentially be attributed to 7.5% technical progress, whilst total technical efficiency rose by 1.2%. Almost 80% of the sugar beet producers underwent technical progress. For farms technical efficiency decreased for 37.0% and increased for 56.6% of farms. The increase in technical efficiency (column 3) can be attributed essentially to an enhanced scale efficiency of 2.3%. The scale efficiency of sugar beet growers improved for 48.1% of them and worsened for 42.6%.

Table 5

Malmquist index summary in Hungarian sugar beet production

	Malmquist Productivity Index	Technical change	Total technical efficiency change	Pure technical efficiency change	Scale efficiency change
Mean	1.087	1.075	1.012	0.989	1.023
SD	0.303	0.099	0.273	0.174	0.304
Min	0.348	0.772	0.300	0.566	0.348
Max	1.717	1.303	1.664	1.749	1.712
Share of farms, %					
Worsened	35.2	20.4	37.0	37.0	42.6
Unchanged	0.0	0.0	7.4	16.7	9.3
Improved	64.8	79.6	56.6	46.3	48.1
	100.0	100.0	100.0	100.0	100.0

5.3. Changes in total factor productivity on factories' districts

The annual efficiency scores between districts can be compared thanks to the calculations on the same frontier and later separated into districts (see Table 6). The highest technical efficiency can be observed, in 2004, in the Szerencs district, then followed Kaba district and then Szolnok. In these districts during the following year technical efficiency decreased, meaning that the efficiency scores average was closer to the frontier in 2004 than in 2005. In those districts with the lowest technical efficiency, namely Petőháza and Kaposvár, this indicator increased in 2005 compared to the previous year, exceeding technical efficiency level in the other three districts. This shift in sugar beet production technical efficiency can be linked to the processors' future strategy in these districts and was due to improving pure technical efficiency and scale efficiency. However, other than Kaba district's scale efficiency improvement, in 2004 these indicators worsened in the three most efficient districts.

Table 6

Hungarian sugar beet production Technical efficiency and scale efficiency summary statistics by production districts

	Total technical efficiency	Pure technical efficiency	Scale efficiency
2004			
District of Szolnok	0.876	0.901	0.973
District of Szerencs	0.964	0.980	0.984
District of Kaba	0.849	0.951	0.893
District of Kaposvár	0.786	0.825	0.953
District of Petőháza	0.663	0.796	0.833
2005			
District of Szolnok	0.711	0.780	0.911
District of Szerencs	0.810	0.829	0.977
District of Kaba	0.764	0.813	0.939
District of Kaposvár	0.939	0.956	0.982
District of Petőháza	0.774	0.879	0.881

In Table 7 are TFP changes in 5 sugar beet producing districts. In 2004 TFP increased only in Petőháza and Kaposvár, and this was because of greater technical change and technical efficiency. In Petőháza district technical efficiency increased by 20% and was vital to pure efficiency increase (10.4%) and scale efficiency (5.7%). For Kaposvár district the pure technical efficiency increased by 16.0% and scale efficiency by 3.1%.

In 2004 in the more technically efficient districts TFP decreased because of a sharp decline in their technical efficiency. This largely stemmed from a drop in pure technical efficiency. This means that, in the districts where TFP dropped, growth in technical change was not supported by the growth in total technical efficiency change. Therefore, despite technical progress efficient use of inputs worsened.

Table 7

Malmquist index means on the factories' districts

	Malmquist Productivity Index	Technical change	Total technical efficiency change	Pure technical efficiency change	Scale efficiency change
District of Szolnok	0.872	1.076	0.811	0.866	0.937
District of Szerencs	0.890	1.059	0.840	0.846	0.993
District of Kaba	0.950	1.056	0.900	0.855	1.052
District of Kaposvár	1.241	1.038	1.195	1.160	1.031
District of Petőháza	1.287	1.102	1.168	1.104	1.057

6. Conclusions

The empirical results regarding efficiency and total factor productivity estimations indicate that between 2004 and 2005 the increase in sugar beet production was attained with a very stable total technical efficiency, which was around 0.80 for CRS efficiency and 0.87 for VRS efficiency, and a total factor productivity improvement of 9%. The stable total technical efficiency suggests that in both years farms have a similar pattern of being clustered towards the frontier, which means that farms in 2005 had the same homogeneous practices as in 2004. The primary cause of productivity growth was the enterprises' technical change growth of 7.5%. This means that with the same inputs used in sugar beet production the output increased due to sectoral regulatory changes, namely the advent of CMO sugar policy. The technical change increase was not followed by a similar increase in total technical efficiency (1.2%), which suggests that opportunities generated by technological change were not exploited in terms of efficiency. The technical efficiency scores imply that all inputs can be reduced by almost 20% without altering the output, while input slacks suggest further input reduction can be performed. This is especially true for labour and wouldn't entail a decrease in output.

The analysis of returns to scale indicates that almost half of sugar beet producers (48%) operate under IRS, which means that they are too small to produce at scale efficient level. The share of DRS sugar beet growers grew, while the number of scale efficient farms declined.

These support our expectation that the EU sugar beet production regulatory system does not prompt an improvement in efficiency.

During the years in question the efficiency ranking of sugar beet production districts changed . In the first year the most efficient district was Szerencs, followed by Kaba and Szolnok, and in the second year Kaposvár, then Szerencs and Petőháza. As for change in total technical efficiency, only in Kaposvár and Petőháza was technical change exploited. In the districts where the total technical efficiency was higher than technical change, sugar beet producers improved their efficiency performance and these sugar beet growers (districts) become more competitive. However, in the coming years sugar beet production depends on whether or not the processors choose to continue

One of the primary tasks of agricultural policy is to support necessary changes in CMO sugar policy to facilitate productivity and efficiency. Vital to this is allowing quota transfers within member states and between production districts. If this occurs, one can increase the number of scale efficient sugar beet growers.

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Changes in the Hungarian dairy industry after EU accession[1]

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Abstract

Since EU accession the Hungarian dairy industry's domestic market has generally expanded as turnover and consumption have both grown, but this has been increasingly due to cheap imports, while the purchase and sale of domestic products has been decreasing or stagnating (both in the domestic and foreign markets). The growth in imports has cut Hungarian corporations domestic market share to 80%. In Hungary corporate concentration has become even more pronounced with large corporations further strengthening their position and smaller ones further shrinking. Moreover, foreign ownership prevails and has the primary aim of meeting domestic demand. Changes in ownership contribute to the strengthening of vertical integration. Still, in the EU corporate concentration trends also exist. However, in the current fierce competitive market, it is not yet apparent whether non-producer ownership or co-operative ownership is more viable. Therefore the increase in Hungarian owners and ownership of processing plants by (Hungarian) producers does not necessarily signal the end of the crisis, but may in fact still signal decline. Positive aspects are increasing concentration and, from the consumers' standpoint, cheaper dairy products. Cheaper milk products have put great pressure on milk producers (lower milk prices), and have had a positive effect on consumption trends. Milk drinks and some new milk products have been replaced by products with lower milk content and milk-imitations.

Key words

Dairy industry, milk, Hungary, EU, agriculture, trade

Introduction

The 2004 CAP reform restructured the EU dairy industry. In Hungary adapting to the EU internal market has produced insecurity due to the painful process of price adjustments and forced rationalisation imposed by tough competition. This insecurity is compounded by the fact that, at the WTO's Hong Kong negociations, the EU agreed to decrease union duties and export subsidies. Also problematic is accessing markets as there is general overproduction and a more than 100% self-sufficiency rate both in Hungary and the EU. In the future even sharper competition is expected. This is *guaranteed* by a more liberal EU policy, WTO reforms, and the emergence of new competitors. Inevitably the vital transformation of production, processing and sales will continue. Domestic and international consumption trends and those in trade and production presage hard times for the dairy industry.

1. **Corporate structure, concentration and ownership structures of the Hungarian dairy industry**

In the post-assession period, the dairy industry is also affected by increasing competition, which is reflected by corporate transformation. **Within the dairy industry** the major **corporations** (based on revenue) are Friesland, Sole, MiZo, Danone, Tolna, Pannon and Veszprémtej (in 2003 Parmalat was still 6th, but by 2004 it was no longer in the top 10). On the basis of milk quantity purchased from producers, the order is the following: Friesland, Sole, MiZo, Tolnatej, Pannontej, Danone, Északtej, Veszprémtej, Óvártej, Parmalat. In 2004 these companies represented 76% of industry revenue (or 70% of the milk quantity purchased from producers). In the dairy industry between 1997 and 2004 the number of corporations decreased from 104 to 93. The extent of concentration is reflected by the fact that between 1997 to 2004 the major corporations' market participation shot up in terms of revenue, and by 2004 **Friesland reached a market participation of 24%**, followed by Sole's 15%. Based on 2004 net revenue, the joint market participation of **Sole and Új-MiZo,** (considered one company according to 2005 ownership structures) was **26%**. Therefore **Sole-MiZo and Friesland accounted for half of the sector's 2004[4] turnover** (an 8% increase over 2003). Lagging behind was Danone (10%). **One can thus conclude that large corporations further strengthened their position, while the small ones continued to decline.**

Table 1

Increase in corporate concentration between 1997 and 2004, %

Leading corporations	Net revenue in total sales			Net revenue in export sales			Registered capital		
	first 3	first 5	first 10	first 3	first 5	first 10	first 3	first 5	first 10
1997	23.9	35.9	56.4	26.8	34.2	52.5	29.5	38.5	72.9
2000	43.8	56.7	74.9	40.4	46.4	83.8	27.1	51.8	84.1
2003	41.7	57.4	79.9	44.5	55.5	84.9	80.8	86.8	95.2
2004	49.5	66.2	81.9	49.9	62.1	82.6	83.7	87.4	94.8

Note: Sole-MiZo (S. Csányi) and Pannontej-Veszprémtej (Bongrain) were shown separately in this examination.
Source: author's own calculations based on data from Hungarian Tax Authorities and AKI

Total net sales values were solid indicators of domestic sales proportion for the major corporate groups surveyed. This means that the **proportion of domestic and export sales has not changed**. Given that **foreign capital had significantly grown by 2000**, it leads one to think that exports could have expanded as well. After 2000 the sector experienced no significant concentration, either on the basis of export revenue or on the basis of foreign capital share in registered capital (due to the almost 100% value of this latter figure stability can be assumed). Although it tries to gain a large share of the dairy industry (in 2004 their share was 87%), **the primary aim of foreign ownership is to meet domestic demand (and not to increase exports)**. **Foreign participation significantly exceeds the food industry average and it grew until 2004, which was contrary to the food industry trend**. In 2005, due to changes in ownership structure, the previous year's significant **foreign parcipication**

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[4]   The 50% domestic participation of the two dominant corporate groups is not so significant compared to the Dutch concentration, where the two largest groups, Campina and Friesland have a 90% market share.

will probably not further grow as Sándor Csányi acquired the Italian **Sole**. Csányi[5] is also an owner of **Új-Mizo** – who now controls a 25%-20% share in the milk and meat industries. At **Parmalat** there was also a change in ownership, and ownership passed to about 140-150 producers. The main owner is Alföldi Tej Kft, which is controlled by 82 Alföld area producers, but numerous Dunántúl area producers also have a stake. Alföldi Tej Kft. is Sole's largest supplier.

Table 2

Change in foreign participation in the dairy industry's registered capital between 1997 and 2004, %

Year	in the case of the first 3 corporations	in the case of the first 5 corporations	in the case of the first 10 corporations	all the corporations
1997	51.7	56.1	68.2	58.9
2000	94.6	86.5	90.9	80.5
2003	93.0	91.3	88.8	86.4
2004	93.1	91.1	98.0	87.3

Note: Sole-MiZo (S. Csányi) and Pannontej-Veszprémtej (Bongrain) were shown separately in this report. This is important in the case of the first 3, first 5 and first 10 corporations, but does not influence the total.
Source: own calculations on the basis of data from the Hungarian Tax Authorities and AKI

On the one hand, dairy industry **investors'** acquisitions prompt **optimism**, because this reflects financial investors' expectation that this sector's market position will normalise within a few years and they will receive a return on their investments. On the other hand, current investor activity in the industry might **indciate** that **the sector is in a trough** and **now is the time to acquire** the bankrupt **companies** at a good price. However, the question is how much investment is needed to make them competitive. It is also noteworthy that the **investors are Hungarian**, **not foreigners**, although foreign capital also targets promising investments. Therefore, while greater Hungarian ownership is most welcome, the exit or absence of foreign capital foretells further difficulties within the sector (Table 3).

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[5]   The increased competition after the EU accession contributed to Sole's withdrawal from the Central European region, and the withdrawal from Hungary was particularly due to the fact that the export subsidy of feta cheese was stopped (which had a substantial part of their revenue) and in addition, the company had to close down its Pásztó plant, which was not able to meet the EU requirements. The sharp competition resulted in the dismissal of 130 employees in this case. As a result of the rationalisation process after the joint owner of Sole and MiZo took over, the closure of the Kecskemét milk plant was followed by the closure of the central MiZo plant in Pécs as well. This meant the dismissal of 100 + 300 employees. If we add the dismissals (116 employees) after the closure of Friesland's Békéscsaba plant, the dairy industry dismissed about 650 employees. A counter-example is Tolnatej, which even increased the number of its employees in the wake of its developments. This section is based partly on the paper of Mihálovics – Marnitz (2005), Szirmai (2005 a, b), Szabó (2000) as well.

Table 3

**Ownership structure of leading dairy industry corporations (2004)**

Influential participation	Csányi Sándor		Dutch producers	Bongrain		Institutional investors
Corporation (net revenue, percentage of sector, 2004)	Sole (HUF 35 bn, 15%)	Új-MiZo (HUF 26 bn, 11%)	Friesland (HUF 57 bn, 24%)	Pannontej (HUF 12 bn, 4.9%)	Veszprémtej (HUF 10.8 bn, 4.6%)	Danone (HUF 25 bn, 11%)

Note: On the basis of the quantity of milk purchased from producers Sole and MiZo has a 30.5% market share, while Friesland 21% and Danone 4%.
Source: Szirmai 2005, professional interviews and articles

Figure 1

Participation of leading dairy industry corporations selected according to 2004 revenue and examined according to 2005 ownership structures
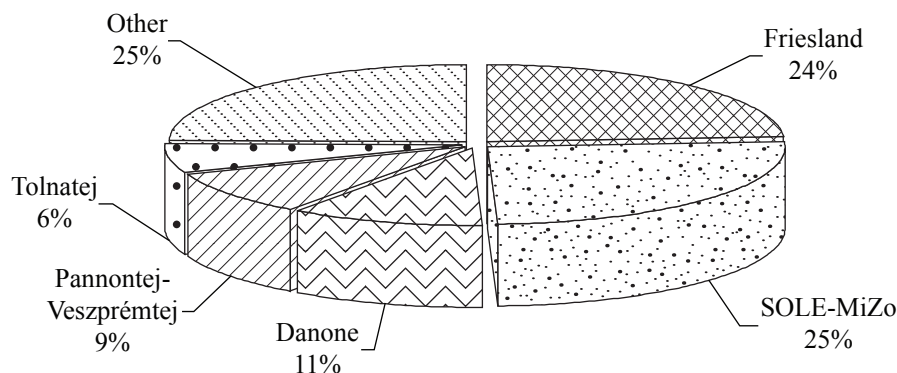
Source: Database of Hungarian Tax Authorities and AKI

In the EU concentration is also taking place. Tight and growing competition, low prices, the need for more efficient production and processing (also cost-efficiency) have meant changes. Among these changes are the formation of more powerful industrial groups and **more concentration in processing**. Greater company size is offsetting the negative effects of lower EU price subsidies on revenues. At the same time this trend bolsters bargaining power against retailers, who would like to drop prices, which would lower prices paid to producers. The emergence of producing and processing corporation groups may be the result of enhanced competition. In **Hungary** this phenomenon can also be observed: for instance, **the Parmalat purchase** proved a good opportunity for Hungarian producers as a processing company became the producers' property resulting in coordination between production and processing[6]. A further step in the struggle against increasing competition may be closer cooperation or fusion.

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[6]   After the establishment of this organisation with government support we will see whether the ambitious plans for purchase (from producers) and sale are viable (eg. exporting 110 million litres of milk and processing 40 million litres of milk). It is particularly thought provoking how far the government loan (from the Hungarian Bank for Developments), making the establishment of this organisation possible, serves the interest of the sector, with special regard to the fact that the main activity of the organisation is delivering milk as raw material to Italy, this way losing the employment opportunities of the potential processing activity.

Integration between producing and processing companies does not only present advantages. **An international example of this is the 2004/2005 unsuccessful attempt at cooperation when the largest EU corporations operated as producer-owned cooperatives** (Fórián, 2005, Dairy Industry news, 2005 Kósa, 2005). Another example of this are the failed negotiations for closer cooperation between **the German Nordmilch and Humana.** These **broke down** at the end of 2004. The early 2005 merger attempt by the Danish **Arla** and the Dutch **Campina** was also a failure, and this despite a year and a half of preparation. One of the reasons for this was the big European companies' less flexible cooperative decision-making system as compared to non-producer ownership. Owing to the stricter market environment in the EU dairy industry, mergers and acquisitions have for several years been commonplace. A good example of this is **the successful 2005 expansion of the privately owned British company Dairy Crest** (Dairy Industry News, 2005). Although **it is clear from the above that corporations not owned by produces can better adapt to the market environment,** there is also a significant number of producer-owned dairy corporations within the EU dairy industry. **Four of the top five largest EU dairy corporations** (based on processed milk in 2004) **operated as cooperatives**. Only one was owned by non-producers while cooperatives and other types of associations were **50-50% in the top ten**. There is a clear intent on the part of the dairy industry to increase concentration. However, negotiations aiming at closer cooperation among four cooperatives from the top five corporations broke down in 2004 and in 2005.

Table 4

Ownership structures of the main dairy industry corporations

Main European dairy companies in 2004, by quantity of processed milk			Main Hungarian dairy companies in 2004, by revenue		
Corporation	Country	Ownership	Corporation	Country	Ownership
Arla	**DK**/SE/UK	producer	Friesland Rt.	**NL**/DE	producer
Groupe Lactails	FR/BE	non-producer	Sole Rt.	HU	non-producer
Friesland Foods	**NL**/DE	producer	Új-MiZo Rt.	HU	non-producer
Campina	**NL**/DE/BE/PL	producer	Danone Kft.	**FR**/USA/UK	non-producer
Nordmilch	**DE**/UK	producer	Tolnatej Rt.	HU	non-producer
Bongrain/CLE	**FR**/BE/DE	non-producer	Pannontej Rt.	**FR**/BE/DE	*non-producer*
Nestlé	CH	non-producer	Veszprémtej Rt.	**FR**/BE/DE	*non-producer*
Sodiaal	FR	non-producer	Északtej Rt.	HU	non-producer
Dairy Crest	UK	non-producer	Óvártej Rt.	HU	non-producer
Humana Milchunion	**DE**/UK	producer	World Proteins Rt.	NL	non-producer

Note: The joint owner of Pannontej and Veszprémtej is Bongrain SA (CLE), and Sole and Új-MiZo have a joint owner as well, therefore their joint role is more significant. In 2005 Parmalat became owned by the Hungarian producers of Alföldi Tej Kft. and operates in the form of cooperative. Although Friesland operates as a cooperative in its mother country, controlled by Dutch producers, the Hungarian Friesland company is governed by its management and not by Hungarian producers, since it is not a cooperative.
Source: Dairy Industry News 2004, Database of Hungarian Tax Authorities and AKI

In Western Europe there is better cooperation between the producing and processing sector. This stems from the the necessity to counterbalance the power of chains, a phenomenom which also exists in Hungary. This coupled with increased price competition

from imported products likely means there will be **closer cooperation among stakeholders in the Hungarian sector[7]. To generate the greater flexibility** required because of increased competition, it would likely be preferable **for Hungary to retain concentrated non-producer ownership** instead of the less flexible producer-owned cooperatives, thus preventing a likely natural elimination process among cooperatives. However, **increased concentration may also entail risks.** A good example of this is **the collapse of** one of the largest international dairy processing corporations (**Parmalat**), which has affected thousands of dairy producers (Popp, 2004). **A major challenge for the Hungarian producer-owned cooperatives is** creating and maintaining competitive sales prices, while at the same time paying high marketing costs and having high producer prices. However, an argument that counters theories questioning the contemporary viability of producer-owned processing corporations is that, in the autumn of 2005, Hungarian **Parmalat became producer-owned.** Moreover, there are about 10 other processing companies owned by producer groups. **Domestic (Hungarian) ownership's increasing role will only prove beneficial** if it means the company can better meet growing competitive challenges and become more sensitive to the problems in the Hungarian environment, which will lead to decisions which are more beneficial toward the Hungarian dairy industry.

As for competitiveness, the **low level of horizontal coordination between milk producers** (except for e.g. Alföldi Tej Kft) and the **low level of vertical coordination between producers and the processing plants** (except for the relationship between Dalmand and Sole) is undesirable. Vertical coordination among producers, processing plants and retailers, only extends to maintaing a business level which serves the interests of retailers and processing plants[8]. The low prices paid to the producers encourage greater concentration in the now **decentralised production structure** because more and more farms fail due to production losses. However, even today there are about 4,400 direct sale producers/farmers (even without having a quota), who sale less than 100 thousand litres of milk per year. Hungary's low standard of competitiveness is mainly due to technological deficiencies and low concentration in production. A trend toward **growing elmination and concentration among the producers coupled with processing side concentration** will lead to more cost-efficient products, and there is also potential for greater cooperation between the two participants. The above trend will in turn help **the sector offer more competively priced products**, enabling it to meet the needs of retailers and consumers and to compete against cheap imported products. **Although increased corporate concentration and high foreign participation increases the Hungarian dairy sector's competitiveness,** it is still not enough to successfully compete against imports and to counter retailers' dominant position. In order to improve efficiency as soon as possible issues related to ownership structures need to be resolved. This is because cheaper fodder produced on freehold land may provide a basis for making the products more competitive.

2. Supply and demand in domestic and foreign markets

The 2004 CAP reform had a serious effect on the EU dairy industry as it lowered the intervention quantity of butter plus the intervention price of butter and skimmed milk powder, which caused milk prices to decline. This ***milk crisis*** has also made it to Western Europe.

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[7] A good example for the cooperation between the production and processing sectors is Danone's cost optimisation programme, which can make the production of farms cooperating with Danone more competitive.

[8] See more about this topic by Fertő et al. (2005 and 2006), and Szabó (2005).

Since the CAP reform, **farmers have been going bankrupt.** In Hungary the cap reform coupled with post-assession **forced price adjustment** (decrease), has increased pressure on domestic market participants. The change in industry regulations may result in **greater cheese production and stronger cheese exports,** but this will be at the expense of butter. The EU's commitment (at the WTO Hong Kong negotiations) to decrease union duties and export subsidies by 2013 is also worrying for the dairy industry. General **overproduction** in Hungary and the EU makes access to the market difficult as the self-sufficiency rate being over 100%.

Cheese, cottage cheese and milk constitute 82% of sales in **domestic milk products** and sour milk products account for 10%. Milk powder and flavoured milk constitute about 2-2%. In 2004 the amount of milk purchased was 1.6 billion litres. **Milk purchased from producers decreased by about 4%** in the first 10 months of 2005 as compared to 2004 to date figures. **Although the purchased amount decreased, the quality improved** because, in 2005 and 2004, 98% of milk purchased was of extra quality, a 7% quality improvement over 2003. In Hungary **the initial year** 2000 **decrease in milk and milk products consumption** continued into 2003. In 2003 **consumption decreased by 1.6 litres per capita, as compared to the year-to-date figure,** descending to 156.5 litres. This was 11.6 litres less than the average between 1995 and 2000. The 2003 decrease was caused by a decline in milk consumption, but there was a slight growth in consumption of other milk products. This was due to changes in consumer habits and milk prices, which, compared to the previous year, grew by 3.2%, while the average cheese consumer price only grew by 1%. Szabó (1999) had already referred to the close relationship between consumption and the level of revenues. In relation to other countries, **Hungary consumes less milk and fewer milk products**. For example, per capita cheese consumption is 8.9 kg while in the EU 15 it sits at 18-19 kg. The previous figures include cottage cheese, which according to EU standards is fresh cheese. In Hungary the year 2003 per capita butter consumption was 1.3 kg, whereas the EU-15 consumed 4.5 kg. In France per capita cheese consumption was 24 kg, and the French surprisingly consumed 8 kg of butter per year! Not only in the old member states is cheese consumption higher than in Hungary (Table 5); Czech, Polish, and Slovenian cheese consumption is about 10 kg. Morevoer, the Polish and Czechs consume per capita about 4 kg. of butter. Within Hungary and internationally the 2005 **consumption and production trends provide few grounds for optimism**. In Hungary the 2005 rise in consumption was triggered by growth in imports, while the milk purchased from Hungarian producers decreased slightly. This food consumption analysis was backed up by data from the Hungarian Central Statistical Agency (2005) and the Élelmiszer (2005).

Table 5

Consumption of milk and milk products in the enlarged EU in 2002

	EU-15	**EU-10**	**Hungary**
Consumption of milk and milk products kg/capita	244.5	186.3	143.1
Butter consumption kg/capita	4.4	3.7	1.0
Cheese consumption kg/capita	18.9	10.8	8.9

Source: Agrár Európa 2004, Central Statistical Agency, FAO Agrostat 2002 and own calculations

The fact that imports' share in domestic consumption grew from 12% in 2003 to about 15% in 2004 illustrates a foreign market surplus and import pressures. **Since 2004 the dairy industry's trade balance (expressed in value) has been negative.** The **increase in imports** has primarily been caused by **cheese supplies**, amounting to almost half of 2004 and 2005 imports. When examining the 2000-2005 **trends in the sale of milk and milk products**, one concludes that from 2003 to 2004 the value of exports expressed in USD slightly decreased, while in 2005 the value grew by 30% due to the increase in liquid milk exports. It is **noteworthy** that in **2004 imports shot up by 115% and that in 2005 they grew by 36%.** As for **cheese exports,** in 2005 Hungary's **main markets remained Saudi-Arabia, Lebanon** and the other traditional Middle-Eastern target markets, as well as **Macedonia and Japan** (with a total share of approximately 70%); In 2005 Italy constituted the the main foreign market for Hungarian milk. Hungarian exports to the Middle East may get a temporary boost because of Arab countries' anger at the Mohamed cartoons published in Denmark. Because of the cartoons, the Arab countries might slap a limit on Hungary's main rival (Arla). An indication of suppliers' optimism in maintaining their unexpected Arab market is that Köröstej purchased Friesland's Hajdúböszörmény cheese factory in order to satisfy increased Arab consumer demand. Arab hostility toward Denmark peaked in 2005, but in the spring of 2006 some Arab consumers still continued their boycott of Danish cheese, which helped Hungarian exports to the region. Shifting trade in milk and milk products is revealed by an increase in imports from our northern neighbours and an increase in exports towards the south (e.g. to Italy).

In 2003, 2004 and 2005 imports of milk and milk products as raw material grew less than imports of processed milk products. This was because demand for products requiring larger quantities of liquid milk (cheese, butter) was less than that for products requiring relatively less liquid milk. From 2003 to 2005 milk imports expressed in tonnes grew thirteenfold, by 50 thousand tonnes (expressed in value this is a twelvefold growth). Cheese imports grew by 51 thousand tonnes, which is a 57% increase. The same phenomenon, albeit more moderate, is also present for **exports.** Between **2003 to 2005 in both exports and imports** there was **an increase in less processed products. Unfortunately, growth in imports considerably exceeded growth in exports.**

Table 6

Export and import of main milk products, 2000-2005

Name			2000	2002	2003	2004	2005	2005/2000, %	2005/2003, %
Export	thousand USD	Milk	17,304	17,080	15,657	20,478	46,621	269	298
		Milk powder, condensed milk	4,902	12,567	16,645	2,533	2,541	52	15
		Cheese	40,221	41,347	49,484	50,539	50,875	126	103
	thousand tons	Milk	66.4	60.4	45.6	49.4	105.9	159	232
		Cheese	1.2	20.2	23.4	19.7	17.1	1,425	73
Import	thousand USD	Milk	1,016	753	3,384	21,801	41,409	4,076	1,224
		Sour cream, yoghurt	5,743	5,976	10,680	25,564	26,881	468	252
		Butter	1,372	1,294	4,304	14,092	13,615	992	316
		Cheese	22,040	27,885	34,644	63,798	92,051	418	266
	thousand tons	Milk	1.7	1.1	4.0	29.4	54.6	3,212	1,365
		Sour cream, yoghurt	8.4	7.4	12.1	18.5	22.0	262	182
		Butter	0.9	0.8	1.6	4.3	3.4	378	213
		Cheese	11.1	11.3	12.7	18.3	20.0	180	157

Source: author's own calculations on the basis of Central Statistical Agency and AKI database.

For the past few years a major increase in domestic **cheese consumption** has been expected. However, despite an increase in imports, it hasn't occurred yet. The anticipated rise in consumption is mainly associated with cheap milk.

Cheese remains one of the most promising products. Based on consumption structures in the more developed countries, international trends forecast growth in special milk products consumption. **These include products with higher value added** such as flavoured milk, special fruit yoghurts, and cream cheese, and low-fat products. Also included are products enriched by special additives, dessert products, special types of cheese, vitamin enriched highly processed products, and probiotic cultures. **The slight increase in our consumption may be explained by the post-accession emergence of cheap import products. Another factor could be that Hungary currently lags well behind the international and former domestic level. However, this is certainly not indicated by international and long-term domestic consumption trends[9]. To boost demand continual innovation and the launch of new modern milk products are very important.** The dairy industry is not geared to the export market and for this reason foreign markets do not offer solid growth potential.

By terminating the **quota-free direct sale of 250 million litres of milk** (including milk for personal use) and directing it to official sales channels, corporations' excess capacities could be reduced. This would bolster milk processing and the quantity of milk products in

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[9]   According to GfK, consumption of milk products grew by 5% in the first nine months of 2005 as compared to year-to-date data. This also includes the fact that milk consumption was the highest in Hungary among Central European countries, amounting to 78 litres per capita.

shops (Kőnig et al., 2004). However, there is some doubt as to whether this will work due to difficulties in estimating consumer capacities. Obviously, from a social and economic standpoint, there is still a need for small producers selling directly from their own homes, of whose milk mostly lies in the grey milk category. For the small producer such direct sales are often the only way to make money. Moreover, large processing plants and retailers may not be able to meet this market need as such direct sales offer accessibility and can accommodate specific consumer requirements. The Austrian example confirms the likely survival of such direct sales, but in Austria producers have a permanent direct sales quota, which does not exist in Hungary.

Based on the above, one may conclude that although the post-accesion dairy industry structure has already been substantially altered, the process is not yet complete. On the contrary, this is only the start of a process which, if accompanied by thorough structural transformation, will hopefully create a competitive dairy industry. Such a transformation must be adapted to the quickly changing market environment. Transforming the dairy industry may be facilitated with loans designed to alleviate problems caused by lack of capital. Also the government could increase marketing support to boost sales.

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Hungarian meat sector restructuration
in the post-EU accession period

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Abstract

In Hungary corporate concentration in the meat processing industry based on revenue is lower than in other Hungarian food industry sectors and also compared to the concentration level in West European countries. In the sector the share of foreign capital is also very low (17%). Because of the low share of foreign capital and relatively small concentration, structural and ownership changes were to be expected, resulting in a more concentrated and competitive sector. The restructuring process involved a number of steps. First of all, Sándor Csányi acquired Délhús and then later acquired Pick Szeged, and in 2005 these two corporations' sectoral share was about 25%. As for the other two large corporations – R-KO-N and Carnex – in late 2005 the latter weakened significantly causing a loss in market share and the bankruptcy of two companies within its industrial group. Currently the meat sector is undergoing rationalisation of costs and activities, coordination, and an elimination process, all brought on by increasing competition. Pork consumption tends to run counter to the rising standard of living as consumption has been stagnating for years. Domestic production of pork is going down but imports (mainly live pigs) are shooting up. Now a portion of produced pork (mainly carcass meat) can be sold in Hungarian's export markets at the pre-accession level. Even today the elimination process is affecting numerous abattoirs. Changes in ownership structure could hasten the elimination process, leading to a reduction in the large surplus capacities. For example, in 2003 50% of pig slaughtering capacities were used, similar to the capacity used in salami and sausage production.[3]

Key words

Pig, food industry, EU Accession, trade

1. Corporate structure, concentration and ownership structure

The meat-processing sector entails the following: cattle and pig slaughtering, processing and *further processing*, meaning activities of Nos 1511 and 1513, but not including poultry processing companies. The meat-processing sector generates the food industry's largest revenue. The major market players in pig processing are the following: Pick, Délhús, Pápai Hús, Kométa and Debreceni Hús Rt, which accounted for 34% of the entire 2004 sector. The top 10 corporations account for 53% of the sector's total revenue and 74% of exports. The top 10 processing companies share of 2004 net revenue did not match the 1997 level and concentration according to export income also dropped. In meat processing **concentration is only moderate and** has dropped slightly (Table 1).

Table 1

Corporate concentration between 1997 and 2004, %

Number of corporations	Net revenue in total sales			Net revenue in export sales			Registered capital		
	first 3	first 5	first 10	first 3	first 5	first 10	first 3	first 5	first 10
1997	28.6	41.3	60.7	38.2	55.7	79.4	29.1	37.1	56.8
2000	27.9	40.4	57.3	39.0	48.6	75.3	31.7	39.0	57.7
2004	25.0	34.5	53.3	30.9	38.1	73.7	20.0	34.5	56.1

Source: own calculations based on the data from Hungarian Tax Authorities and AKI

The extent of concentration in meat processing lags behind other sectors, and the sector also suffers from a lack of foreign capital. Foreign capital's share of registered capital is significantly below 52%, which is characteristic for the food industry as a whole (Table 2). **In 2004 foreign capital's share in meat processing was 17% indicating a significant decrease from the previous years**. Pig processing has mainly Hungarian ownership.

Table 2

Foreign participation in the registered capital, %

Year	in the case of the first 3 corporations	in the case of the first 5 corporations	in the case of the first 10 corporations	All the corporations
1997	79.6	74.3	48.9	41.2
2000	61.1	60.3	47.5	37.6
2004	20.3	17.3	19.6	17.4

Source: own calculations based on the data from Hungarian Tax Authorities and AKI

Kometa is a major foreign company and it is located in Kaposvár. Kometa is owned by the Italian Pedranzini family. In Kuskunféleghéza, the slaughterhouse's owner is also an Italian family by the name of of Pini. Up to 1999 they owned the now Kometa Co. Other than the phenomenom of decreasing concentration, it is also clear that foreign capital is also leaving the country. The main reason for this is the 2001-2004 transfer of ownership between Zimbo and Délhús (from Austrian to Hungarian ownership). Because of the ownership transfer between these two major companies, the sector's level of foreign ownership has sharply declined. This can be explained by a decentralized processing system, the surplus capacity, a weak internal market, and a lack of strong brand names.

One of the sector's main problems is that numerous abattoirs only serve the domestic market. According to the National Food Investigation Institute, in September 2005 there were 287 such abattoirs in Hungary. 80 of the abattoir/processing plants had EU codes and there were 91 which were only involved in processing; the latter figure being the most noteworthy.

In 2003 the sector went through a series of closures. In 2003 the national **capacity use** level **was only 51%**, which is very low. At 38-53%, salami and sausage production lines were also under-utilized, while meat product production was slightly higher at 73%.

Due to surplus capacity and low concentration, structural and ownership changes were expected, and these changes will lead to a more concentrated and competitive sector. **In 2005 meat processing ownership structure changed significantly[4].** The most important change in ownership was Délhús's acquisition of Pick Szeged which meant that Pick's was transferred from Arago to Sándor Csányi. Their joint market share accounts for 20%. In the meat sector such a large market share is remarkable as the second largest owner accounts for less than 10% in revenue. In 2005 the three leading owners' share (Csányi, Mónos, Román) accounted for 40% of the sector (Table 3, Figure 1). Other than growing competition, the sector's restructuration was also explained by competitors biding their time until weak companies were eliminated. However, during this period they became indebted and one significant creditor grew strong enough to acquire Délhús and Pick and thus became a dominant market player. The next target for concentration and acquisition could well be the meat processing plant in Gyula as it shares traits with other companies that were either closed down or acquired (Zalahús, Pick). Like previous meat processing failures, the Gyula plant is suffering financially.

Table 3

Leading corporations in meat processing in 2005

Owners	Gyula Román R-KO-N-group	Péter Mónos CARNEX group*	Sándor Csányi
Corporations	Debreceni Húsipari Rt.	Pápai Hús Rt.	Délhús Rt.
	Csabahús Kft.	Falcotrade Rt.	Pick Szeged Rt.
	Sole-Meat Kft.	Borsi Húsipari Rt.	
	Kapuvári Hús Rt.		

* Remark: At the beginning of 2006 CARNEX became bankrupt.
Source: Szirmai 2005, articles and interviews with experts

In 2005, Hungarian meat processors lost both Hungarian and external markets. Among other reasons, this was due to increasing costs and to expensive Hungarian raw materials. In December 2003, two Carnex Rt companies declared bankruptcy. These were Falcotrade and Borsi which had lost about HUF 3 billion.

In 2006 sectoral structural changes continued. Délhús merged with Pick Szeged Rt. The new company's market share is expected to reach 30% and thus R-K-O-N group's share will be 17%. Also in 2006 CARNEX Group broke up. In 2006 Hungary-Meat may expect a 10% share while Kometa and Gyula will have to be satisfied with 7% each.

After EU Accesssion, competition strengthened and subsequent rationalisation, closures and liquidations (Ringa Sopronban, Zalahús, Gyulai Húskombinát, Borsi Rt.) seriously affected the sector. **About 3000 employees** were laid off, totalling 20% of the sector's employees. Closures and lay-offs signal a serious crisis. However, the new owners and professional financial investors feel that in the future the sector might enjoy stability.

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[4]   It is important to note that the structure of the sector analysed on the basis on the balance sheet data of APEH (2004) can reflect only approximately the permanently changing structure. It is probable that the data of 2003 reflect better the real position of the companies in the sector since at that time the balance sheet indicators were less affected by the changes performed in order to reach business interests (acquisition-sales).

In meat processing – as in poultry processing – **specialisation** has already started. Pick-Délhús has undertaken rationalisation measures. Under the new ownership domestic sales are managed from Délhús in Pécs and the export sales from Pick in Szeged. In Szeged sausage and salami continued while Délhús produces other meat products. Another sign of specialisation is that slaughtering and the production of finished products are done separately. For example, new processing companies are Alföld and Szigetfő.

A good example of **vertical integration** is that in spring 2005 the retail store **SPAR** opened its own **meat processing company** in Bicske. To counter the power of retailers, processors (mainly from the meat sector) plan to establish their own chain stores.

Figure 1

Market share of the leading meat processing corporations at of end of 2005*
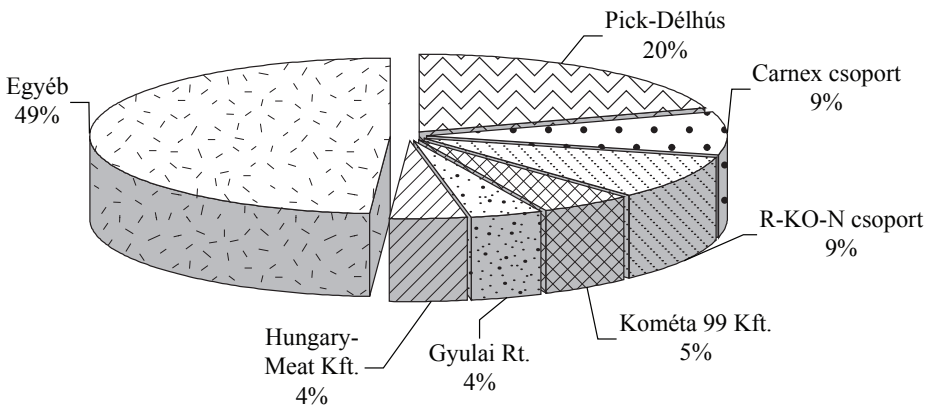
* Value based, on 2004 revenues. Carnex Rt. Borsi Hús Rt revenue. is not included.
Source: databases of Hungarian Tax Authorities and AKI, Szirmai 2005, Kaiser Almanach 2004, Szirmai 2005, articles and interviews with experts

In the developed countries concentration in the meat sector is strong. It is increasingly frequent for companies involved in pig slaughtering to also slaughter poultry. In Germany the top 10 companies' share accounts for 62% in the value of total production (Kohlmüller, 2005), quadruple that of the 2003 indicators for Hungarian meat processing. However, one must consider that the German market is eight times larger, and the companies are all bigger than their Hungarian counterparts. The 10 largest EU abattoirs serve 30% of the common market (Table 4). First among the 10 largest companies is a Danish company, and there are four German and three French companies.

Table 4

The ten largest abattoirs in the EU (2003)

Name of the corporation	Market share, %	Member State
Danish Crown	10.0	Denmark
Vion Foods	8.0	Netherlands/Germany
Westfleisch	2.4	Germany
Tönnies	2.3	Germany
Cooperl	1.6	France
Socopa	1.6	France
Glon Sanders	1.0	France
Grampian	1.0	UK
Swedish Meats	1.0	Sweden
Gausepohl	0.8	Germany

Source: Harris, 2005

Concentration in EU meat processing is below the US CR4 indicator. In the USA the four largest meat processors in 1997 controlled 57% of the market. During the eighties concentration in the pig sector grew by 10 percent (Ollinger et al. 2005). However, it is necessary to mention that the four largest companies control only 20% of the market.

On the list of the world's 50 largest meat and poultry processors only two European companies are in the top ten. On the same list are mainly American companies, and one Japanese. Danish Crown, the top company in Europe, is only 9th on the world list (Annex 21). It is noteworthy that the revenue for the total Hungarian meat processing industry, including production of meat products, comes to HUF 350 billion. This equals only one fourth of the Danish company's revenue: EUR 6 billion (HUF 1,500 billion).

According to foreign experts' opinion, Danish and German investment will fuel future meat processing in Poland, the Czech Republic and in Hungary. The proximity to large markets in Ukraine and Russia will undoubtedly provide the new EU member states with opportunities. The large Swedish meat processors are targeting the Baltic markets, while the American Smithfield Foods is targeting Eastern Europe (Foreign Agricultural Service – USDA and CIAA).

2. Supply and demand

In 2003 pork consumption decreased **by 3.2%** from the preceding year, but compared to the averages between 1995-2000 it increased by 1.1%. In other words, it is stagnating at 27.5 kg/capita. The demand for pork depends significantly on one's income. This is revealed by the more than 50% difference in expenditures between upper and lower income households. Hungarian consumption is significantly below EU consumption but the consumption in other Member States also varies considerably.

In general, economic progress (increasing incomes and purchasing power) favour consumption. However, Figure 2 shows that, despite economic progress, pork consumption

is losing out to other products. These tendencies confirm that growth in **pork consumption** is **not, despite economic progress, meeting expectations.** The main reason for this is improving health consciousness and growing poultry consumption.

Figure 2

Trends in the standard of living and the consumption of main food products (indices: 1991 = 100)
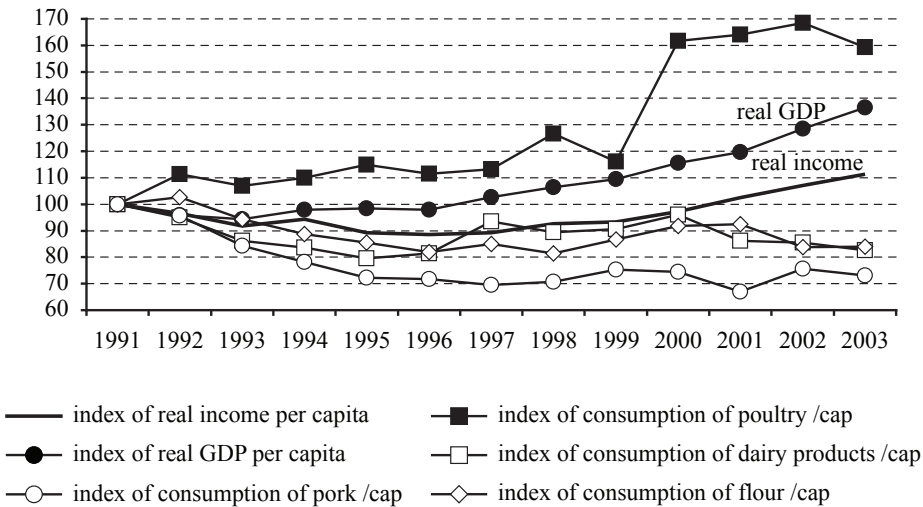
* Between 1999 and 2000 poultry consumption increased by approximately 10 kg/capita according to the data of Central Statistical Office.However, it is doubtful the recorded annual increase is accurate. According to various experts' opinion, 2-3 years previous to this consumption volume was already larger than that recorded by the Central Statistical Office.
Source: Food balances, own calculations base on the data of the Central Statistical Office, Kőnig (2005).

Due to unprofitable production and the current market environment**, supply of Hungarian raw materials is uncertain**. **The high raw material prices and other low market prices favour** (both regarding trade and processing) **an increase in imports**. In 2005 the number of pigs went below 4 million, and in early 2005 there were only 3.9 million pigs.

After the 2004 EU Accesssion, the pig sector's export value did not decrease and this also held true for 2005. Moreover in 2005 it reached its highest level since the turn of the century. This was first of all thanks to the growing export income generated by pork. In considering export volume, we see that it **dipped** slightly **in 2004, meaning that more valuable meat parts were exported.** Moreover, the volume of highly processed products such as salami and sausages dropped for the fourth time in six years time (Table 5).

Table 5

Export of the Hungarian pig sector, 2000-2005

Product	2000	2002	2003	2004	2005	2005/2000
Million USD						%
Live pig	32.3	25.5	14.3	17.5	27.5	85.1
Pork	185.9	199.5	194.8	223.4	247.8	133.3
Sausage, salami	57.2	51.7	54.8	62.3	56.7	99.1
Bacon	5.6	6.1	5.2	4.0	4.0	71.4
Total	280.9	282.8	269.1	307.2	336.0	119.6
Thousand tonnes						%
Live pig	34.0	22.9	15.5	12.9	16.9	49.7
Pork	105.0	84.5	83.0	81.0	82.9	78.9
Sausage, salami	32.9	15.7	11.3	10.1	7.9	24.0

* estimation
Source: AKI database and preliminary data of KSH

Hungary's main **export market** is the European Union. In 2005 the EU-25 composed 48% of Hungary's pork exports. Traditionally Spain and Germany are important markets for Hungary, but so are Japan and South Korea to which special meat products including fat are exported. Hungary's main exports are pricey meat parts, while its imports tend to be cheap raw materials which could potentially replace Hungarian raw materials.

In the four years previous to Accession imports in the sector were very low, but in 2004 **the number of imported live pigs shot up** and imported meat products tripled (Table 6). This stemmed from price competitiveness and the problems detailed above. In 2005 the increase in imported pork and live pigs increased and in one year live pig imports doubled. **Most of the live pigs came from Holland.** In 2005 pork volume increased by one third against the already high 2004 volume. In 2005 the pig sector's external trade balance showed a surplus of USD 51 million compared to 2003 which totalled USD 227 million.

Table 6

Import of the Hungarian pig sector, 2000-2005

Product	2000	2002	2003	2004	2005	2005/2000
Million USD						%
Live pig	0.2	0.4	0.3	47.1	95.8	..
Pork	31.1	50.9	39.5	122.1	177.3	570.1
Sausage, salami	0.7	1.2	2.2	6.2	11.7	1,671.4
Thousand tonnes						%
Pork	26.8	38.6	26.9	60.0	78.4	292.5

Source: AKI database and preliminary data of KSH

During recent years transformation involving meat processors – often hard to trace – created a fragmented corporate structure and consequently a weakned lobbying position and weakened sectoral competitiveness. The 2005/2006 corporate restructuration is a by-product of EU Accession, which has created greater transparency and enhanced competition, but which has also revealed the Hungarian sector's weaknesses. During the last years the sector has undergone a process aimed at increasing efficiency, decreasing capacities and hastening a natural elimination process. Though painful, one can only hope this process will eventually strengthen the meat sector. In fact, the first signs of this are now modestly apparent, hinting at greater cooperation in the sector. Using Hungarian resources, the goal is to satisfy the still stagnant domestic demand. In doing so, it is hoped that one can counterbalance increasing imports and enhance the current stagnant state of Hungarian exports.

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Imre Fertő: Agri-food trade between Hungary and the EU[1]

Štefan Bojnec[2]

This is one of the first books that is based on in-depth analytical research and which, in a scientific and comprehensive way, analyzes agri-food trade between East and West. In the wake of the now defunct Soviet era COMECON trade organization, it also deals with the post-Soviet implications for European Union (EU) integration. More specifically, the book represents ground-breaking in-depth analytical research work on agri-food trade between Hungary (a former COMECON socialist country) and its attempt at integrating with the West, and the EU-15. The analyzed period between 1992 and 1998 focuses on the opportunities stipulated by the 1991 Association Agreement between Hungary and the EU-15. During the transition period, the Hungarian food sector was significantly restructured through foreign direct investment, a likely driving force toward increasing the agri-food sector's international competitiveness. For Hungary, then an EU cnadidate, the year 1998 marked the end of the transition period and was followed by a more intense adjustment period. Endowed with excellent trade theory knowledge, the book's author, Imre Fertő, delves into empirical trade theory, methodology and approaches for in-depth investigation of trade patterns. Fertő does this through continual market share analysis, and through revealing comparative trade advantages, and discussing intra-industry trade. The author illustrates its further decomposition on horizontal and vertical intra-industry trade through explanations touching on specific countries' determinants in intra-industry trade. The book is rich in agri-food trade theory and empirical trade analysis.

Therefore, the book thoroughly examines the agri-food trade pattern between Hungary and the EU-15 during the transition period's initial stage encompassing pre-enlargement adjustments towards EU membership. The author employed various theoretical trade concepts and tested them empirically using as yardsticks various trade shares, comparative trade advantages, intra-industry trade, and some other trade methods. Using statistical and econometric methods, the results are investigated in relation to various partial or multiple determinants in terms of their changes. Fertő's book presents a concise combination of theory, methodology, employed data, and empirical results along with their their policy implications.

The book has eight chapters. First is an introduction which comprises opening statements, theoretical background, and concepts to explain trade, particularly in agricultural and food products. Both traditional and emerging new trade theories are utilized to explain agricultural trade. The first chapter also presents research questions and explains the book's structure.

In the second chapter Fertő looks back on the Hungarian economy and agriculture during the nineties to analyse Hungarian agri-food trade with the EU-15. The focus is on main economic indicators, and trade policy environment. Also examined are the economic importance of agriculture and the food industry as well as government support for agriculture. The chapter also studies Hungarian agriculture's competitiveness and the economic environment's synthesis of changes. Among the main economic indicators analyzed are sectoral output and employment, earnings, unemployment, and productivity. Also examined are consumer and agricultural prices and trade terms. To further examine Hungary's transition

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to a market economy, the author focuses on foreign exchange rates and other main economic indicators and their potential impact on the agricultural and food sectors as well as on trade patterns. To illustrate the extent of changes in trade policy the writer gives special attention to Hungary's Association Agreement with the EU-15 and the subsequent agricultural concessions. Also discussed are concessions stemming from the European Free Trade Agreement, the Central European Free Trade Agreement, and the Uruguay Round Agreement. These policy and trade changes are reflected in the level and size of government support for agriculture, measured by the producer subsidy equivalents. The authors uses calculations gathered by the Organization for Ecnoomic Cooperation and Development (OECD) to study Hungarian individual arable crops and livestock. The competitiveness section on Hungarian agriculture actually defines competitiveness and presents different concepts and methodologies for measuring national, industrial, and corporate competitiveness as well as presenting studies and facts on the evolution of Hungarian agricultural competitiveness. Chapter two provides a context for analyzing Hungarian agri-food trade with the EU-15, underlining changes in international trade, macro-economics and in various sectors and the changes' subsequent impact on the agri-food sector and on agri-food trade.

The third chapter analyzes Hungarian agricultural trade with the EU-15. The analysis is conducted for total Hungarian agricultural trade in terms of main product groups, geographical distribution and individual EU-15 member states. Besides analyzing Hungarian agri-food trade structures with the EU-15, Fertő uses Herfindahl-Hirschman indices to analyze trade similarity and trade concentration

Employing a constant market share analysis, the fourth chapter evaluates Hungarian agricultural trade sources with the EU-15. The author summarizes the various constant market share models and calculation procedures. The empirical results are based on one and two-stage constant market share models in terms of product groups and in terms of the EU-15 member states. The results using the constant market share models are conducted first for Hungarian exports and then imports, and then separately for EU-15 exports and later imports. Applied are the alternative specification and alternative desegregation procedures. At the first level the constant market share model is decomposed by market size effect, market composition effect, competitive effect, changes in export/imports, structural effect, residual effect, and second-order effect. At the second level the constant market share model is decomposed by growth effect, market size effect, pure residual effect, static structural residual, pure second-order effect and dynamic structural residual. To test the results' stability, a sensitivity analysis is conducted using varying assumptions that consider, respectively, variations due to the commodity aggregation, variations due to end of year changes, and variations due to changes in reference market. Constant market share analysis indicates that Hungarian competitiveness in agri-food trade with the EU-15 deteriorated.

The fifth chapter reveals comparative advantageous measures for Hungarian agriculture. This chapter further develops theories and methodologies for measuring revealed comparative advantage. These theories and methodologies were initially formulated by Bela Balassa and various other authors. The book's author is cognizant of methodological issues for measuring revealed comparative advantage and new trends in literature on methodological issues related to measuring. Fertő is also familiar with empirical models and procedures for measuring revealed comparative advantage. This is tested and further developed in the form of alternative approaches for measuring revealed comparative advantage as it pertains to Hungarian agriculture. Fertő carried out different consistency tests and stability measures

for calculated bilateral revealed comparative advantage measures. Other than Hugarian argriculture's bilateral revealed comparative advantages, Fertő also analyzed regional and global revealed comparative advantages in Hungarian agriculture by employing the three different benchmark markets as comparisons. As with bilateral comparative advantages, and also with regional and global revealed comparative advantages, consistency is also evaluated through testing (cardinal test: correlation coefficients of paired indices, ordinal test: rank correlation coefficients of paired indices, and dichotomous test: shares of matching indices). In order to form conclusions and to examine the implications for Hungarian agriculture and the food sector, tests are also done to measure stability. The stability testing entails the following: correlation indices' coefficients, empirical distribution of indices, the Jarque-Bera test, and changes in trade structure and indices' transition probabilities. Revealed comparative advantage indices for the transition period indicate that Hungary experienced comparative export and trade advantagess in livestock and arable crop products, but otherwise lost ground. The approaches used in the book are not only relevant for other countries in the region and in general go beyond analysis of agricultural and food sector comparative advantages.

The sixth chapter is devoted to theoretical and methodological issues for measuring intra-industry trade. Also presented in this chapter is the intra-industry trade concept coupled with its most common measures and various approaches for measuring it. Stress is on measuring static intra-industry trade and its decomposition on vertical and horizontal components. Measuring static intra-industry trade entails the trade imbalance problem, the categorical bias and the geographical bias as a pssobile means for improvement when measuring the degree and level of intra-industry trade. Besides measuring static intra-industry trade, plus the degree and level of intra-industry trade and their vertical and horizontal components, also described are recent advances in the concept of dynamic or marginal intra-industry trade with associate adjustments costs.

The seventh chapter also discusses intra-industry trade, but in a applied empirical manner. Here the author empirically analyzes intra-industry trade between Hungary and the EU-15 in agri-food products. As an introduction to empirical calculations of intra-industry trade patterns between Hungary and the EU-15 in agri-food products, Fertő provides an overview of the empirical studies dealing with intra-industry trade and hypothesis testing for determinants of intra-industry trade in agri-food products. Following this, intra-industry trade patterns between Hungary and the EU-15 in agri-food products are presented. The static traditional Grubel-Lloyd intra-industry trade index and other methods of its decomposition on horizontal and vertical intra-industry trade is provided as is dynamic marginal intra-industry trade with associated adjustment costs. Also evaluated are categorical bias and ranking of the EU-15 in terms of their intra-industry trade level in agri-food products with Hungary. During the 1990s intra-industry trade in agri-food products between Hungary and the EU-15 was found to be weak indicating low external integration of the Hungarian agri-food sector with the EU-15 markets. This is because in the early 90s the EU-15 market for Hungary was in its infancy following the stipulated Association Agreement. Over the examined period an increase in intra-industry trade in agri-food products between Hungary and the EU-15 indicates an increase in external market integration. This trend is consistent with trade liberalization efforts and Hungarian agri-food sector restructuring. It also meshes with the economic growth which is behind the increase in bilateral matched trade flow in similar products. More in-depth results indicate that this was not a uniform pattern as the results vary by product group. This also varies for individual EU-15 member states. In agri-food products different bilateral trade integration patterns between Hungary and the

EU-15 suggest that the transition process remained incomplete. Also restructuring by different product categories and different business and trade relations between Hungary and the individual EU-15 countries could be due to a number of economic and non economic factors. These include transport costs for distant market outlets, common borders, and knowledge of foreign languages Also noteworthy is that matched intra-industry trade is dominated by vertically differentiated products where the difference between export and import unit value is greater. Inter-industry trade's prevalence and the low extent of intra-industry trade in agri-food products are also confirmed by marginal intra-industry trade indices. For marginal intra-industry trade vertical intra-industry trade is again prevalent. Inter-industry trade prevalence and vertical intra-industry trade are more likely to be associated with higher adjustment costs necessary for restructuring and reallocation of production factors between industries or within the same industry. The authors contends that for matched two-way intra-industry trade vertical intra-industry's dominance implies that the Hugarian and EU-15 agri-food sectors have been developing in a complementary way which is reducing adjustment costs. Moreover, the obtained empirical results for various types of intra-industry trade as a dependent variable are tested in the regression framework employing the set of country-specific determinants or explanatory variables. The level of intra-industry trade is found as a more appropriate dependent variable than the degree of intra-industry trade. The country-specific determinants of intra-industry trade are tested to explain results obtained for total intra-industry trade, for horizontal and vertical intra-industry trade, and for marginal intra-industry trade. Among things considered for country-specific determinants or explanatory variables of intra-industry trade are: tests and differences in per capita income measured by per capita gross-domestic product between Hungary and its EU-15 trading partners, differences between partner nations' sizes, market size, and transportation costs. The national determinants' results for Hungarian intra-industry trade in agri-food products with the EU-15 imply that their country-specific determinants differ for intra-industry trade types of horizontal and vertical components.

The final chapter summarizes the empirical analysis's main results and draws conclusions that include main findings, plus implications and directions for future research. The last chapter contains the main findings for the each chapter. In this section there is also a comparitive analysis of Hungarian agri-food competitiveness by combining all applied approaches: constant market shares, revealed comparative advantage, static Grubel-Lloyd intra-industry trade index and dynamic marginal intra-industry trade index. The comparison of the results is presented by two-digit Standard International Trade Classification groups. In another part there are also country-specific determinants for Hungarian agri-food intra-industry trade using regression framework. Fertő also outlines various weaknesses in his research which are explicitly designed as a guide for future research. These are trade distortions caused by government policies and intervention that affect different trade measures, comparative advantage, competitiveness, and trade types. Other than national factors in the pertinent literature, hypotheses are often tested using simultaneously both country and industry-specific factors explaining the various types of intra-industry trade. Due to lack of data, industry-specific factors in regression analysis are omitted. Finally, another goal for future research involves trade dyniamics analysis using marginal intra-industry trade measures and updated analysis.

The book provides extensive references. These encompass general trade literature, relevant references for agri-food trade (still rather rare) plus references on agricultural and food transition and European integration. In the Appendix is a more detailed explanation and list of agri-food commodities than in the empirical analysis. Also included are more detailed results for bilateral, regional and global revealed comparative advantage indices for Hungarian agri-food products. Following that there is the degree of horizontal and vertical intra-industry trade and the Nilsson's measure for the level of horizontal and vertical intra-industry trade in agri-food products between Hungary and the EU-15. Finally, there are also descriptive statistics for variables in regressions for dependent variable (total intra-industry trade, horizontal and vertical intra-industry trade, respectively) and for explanatory country-specific variables.

The book offers more than a mere understanding of agri-food trade between Hungary and the EU-15. Fertő's book is well illustrated with trade literature overviews, theories, methodologies and different approaches to analyze patterns in trade structures, revealed comparative advantages, intra-industry trade and trade types. The author goes even further as he has developed several applications of different theories, methodologies and approaches for the real trade situation and trade analysis for Hungarian agri-food trade with the EU-15. Therefore, this work is becoming the key reference book for research, post-graduate and study material to examine trade, agri-food trade, transition and EU trade related integration processes in Hungary and the EU-15. This also holds true for studying other countries more closely associated with the EU, and the most recent new member states (including Hungary), and for EU candidate countries. Possible updates for the included research can provide comparisons for transition and pre-enlargement trade patterns. These comparisons can also deal with the most recent post-EU-accession developments which are associated with finalizing the Hungarian agri-food transition process, restructuring, the policy changes and trade shifts toward the borderless Single European Market. So far such post-EU-accession trade study is not yet available for any new EU member country. In the coming years this is likely an area for trade research and this particular book offers an excellent methodological and empirical background for such studies. Therefore, the book's strength is its innovative approaches for studying trade structures, revealed comparative trade advantages, intra-industry trade, and trade types. Fertő's work is pertinent for post-graduate education, in-depth trade research, and policy purposes. It is for those who are interested in static and dynamic trade analysis, agri-food trade and their subsequent relationship with agri-food trade and sectoral transition in Hungary and in other Central and Eastern European countries. The work focuses on transition related issues between East and West, and to adjustments and EU membership. For this reason it is also recommended for Western scholars in this field of study. This applies for those studying general trade, agricultural and food trade, transition economics and European integration.

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11. **Acknowledgement.** Short appreciation of work of contributing persons in research, of reviewers or those who gave financial support for the research.

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3. **Összefoglaló** (abstract): A probléma, a vizsgálat és az eredmények lényegét összegező tömörítvény, maximum 100 szavas, a közlemény elejére kerüljön.

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Könyv:

Harris, S., Swinbank, A. and Wilkinson, G. (1983) **The Food and Farm policies of the European Community.** New York: Wiley.

Könyvrészlet:

Tarditi, S. and Croci-Angelini, E. (1987). Efficiency and equity components of sector policy analysis and evaluation. In: I Y. Leon and L. Mahé (eds), **Income Disparities among Farm Households and Agricultural Policy.** Kiel: Vauk, 43-80.

Folyóirat cikk:

Mergos, G.J. and Yotopoulos, P. A. (1988). Demand for feed input in the Greek livestock sector. **European Review of Agricultural Economics** 15(1): 1-17.

Disszertációk, jelentések, konferencia anyagok

Koester, U. (ed) (1988). Disharmonies in the EC and US Agricultural Policy Measures. Report prepared for the Comission of the European Communities. Brussels: EC Commission.

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