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**THEORETICAL AND PRACTICAL APPROACHES TOWARDS
COORDINATION AND INTEGRATION MECHANISMS:
THE CASE OF THE HUNGARIAN DAIRY SECTOR**

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Abstract

Just before Hungary's EU accession (2004), the dairy sector was one of the most critical industries of the Hungarian agriculture, which is why we chose this for our empirical analysis. Results of our price transmission analysis as well as our previous study on contractual relations in the Hungarian dairy sector obviously show that only the increase of input prices will increase the prices in the production-processing stage. Farmers cannot enforce their interest separately and act against the concentrated processing industry. High investment costs, expensive machinery, the long production cycle from the time of investment, the continuous production and the perishable dairy products are all significant risk factors and deepen the vulnerable situation of farmers.

Independent privately owned farm organisations can not countervail the market power of their business partners. The different coordination mechanisms (including producers' groups, co-operatives etc.) are able to improve and strengthen the position of farmers in the price negotiations for a fairer selling price and for eliminating the fluctuations of the price. Furthermore, some positive effects might go beyond the industry and concern the whole society. Thus, the *two main aims of our paper* are:

- 1) Analysing *imperfections of price transmission and coordination mechanisms* in the *Hungarian dairy chain*,
- 2) as well as, showing possible *theoretical and practical ways of establishing private (market) coordinating organisations*.

As a main body of our study we summarize the strengths, weaknesses, opportunities and threats of the different coordination structures in the frame of a SWOT analysis, assuming two theoretical situations: one is when the coordination is initiated by the processor or when it is initiated by the farmer. As a theoretical background we use New Institutional Economics featuring Transaction Cost Economics (TCE) considerations.

Analysing the statements defined in both SWOT analyses, we find that depending on the initiator of the coordination, there are significant differences between the strengths, weaknesses, opportunities and threats. There are common points, since transaction costs decrease and production is more cost effective in both cases. However, some factors occur as a strength in one system and as a weakness in the other, for e.g. quality. However, we can claim that in any organization the key points of the successful coordination are financial power, quality consciousness, and professional management, and these factors are included as strengths in the processor-initiated coordination.

At the end of our paper we present a successful organisation the Hungarian Alföldi Tej Kft. (Alföldi Milk Selling and Supplying Ltd.) which is a good example for the vertical integration in the dairy chain based on the horizontal coordination of farmers as initiators.

Key words

Dairy sector, price transmission analysis, Contracts, contractual relations, SWOT analysis governance structure, vertical co-ordination, agribusiness, producers' group, co-operation, Transaction Cost Economics, Hungary

JEL Codes: Q13, L14, L22

1. Introduction: background, motivation, aims and methods

Just before Hungary's EU accession (2004), the dairy sector was one of the most critical industries of the Hungarian agriculture, which is why we chose this for our empirical analysis. Results of our price transmission analysis as well as our previous study on contractual relations in the Hungarian dairy sector obviously show that only the increase of input prices will increase the prices in the production-processing stage. Farmers cannot enforce their interest separately and act against the concentrated processing industry. High investment costs, expensive functional machinery, the long production cycle from the time of investment, the continuous production and the perishable dairy products are all significant risk factors and deepen the vulnerable situation of farmers.

Depending on the above characteristics, we formulated the starting point of our analysis: independent privately owned farm organisations can not countervail the market power of their business partners. Accordingly, as a key element of the motivation of submitting our recent study, coordination seems an appropriate solution as it tries to solve the most critical problem: the great deficiency in pursuing the interest of producers in the chain. Thus, the *two main aims of our paper* are:

- 1) analysing *imperfections of price transmission and coordination mechanisms* in the *Hungarian dairy chain*, as well as
- 2) showing possible *theoretical and practical ways of establishing private (market) coordinating organisations*.

It is worth to mention, that our study mainly deals with the producers-processor(s) relationship keeping in mind that retailers are the main players in the field. Despite the above fact and also the new trend of exporting larger quantity of Hungarian milk abroad, we think that market strength and countervailing power of dairy producers is indispensable for stable and well coordinated dairy sector.

We used New Institutional Economics especially Transaction Cost Economics as a theoretical background and carried out a literature review on coordinating matters as well as on bargaining power issues.

Regarding our (previous) empirical works we employed econometric analysis (linear autoregressive model) in our price transmission analysis (see Popovics 2007 a,b, 2008, etc.), and some multivariate techniques regarding contractual issues in the Hungarian dairy chain (see Szabó G.G. – Bárdos, 2005a,b, 2006). We also carried out a case study (on Alföldi Milk Selling and Supplying Ltd.) demonstrating a very interesting case from the Hungarian practice.

The structure of the paper is organised as follows: after *introduction*, the *second session* briefly shows of an analysis of price transmission in the Hungarian dairy sector. The *third session* deals with imperfections in the coordination mechanisms (featuring contractual relations between processors and producers). *The fourth session* contains a SWOT analysis of possible theoretical ways of establishing private (market) coordinating organisations initiated by the producers as well as by the processors. *Section five* presents a brief case study on the successful Hungarian producers' group named Alföldi Milk Selling and Supplying Ltd. which is a good example for the vertical integration based on the horizontal coordination of farmers as initiators. *At the end of our paper* we draw conclusions with their implications and also outline some ideas for future research.

2. Analysis of price transmission in the Hungarian dairy sector from the practical point of view¹

The issues of profitability and the distribution of profits within the sector are of high importance. Our analysis showed that producers within the sector are in a vulnerable situation, they sell milk at nearly the unit cost. Contrary, the retail price of milk we come across in the retail shops is higher than double the farm price. This contradiction drove us to compare the prices of the different stages. To analyse the imbalance in the sector, we have conducted a price transmission analysis for the whole sector that deals with the rate of transmission of price increases and decreases between the specific stages (Popovics, 1997a, b, 2008).

To construct the model, we used *monthly price data of 8 years between 1995 and 2003*. The model uses output prices of the production, processing and retail stages. These prices from the database of the Hungarian Central Statistical Office (KSH) allowed us not only to analyse the price symmetry between the production and retail stages, but also to look at the symmetry between the production-processing and the processing-retail prices by breaking down the stages into two sub-stages through inserting the processing stage.

Our analysis (Popovics, 1997a, b, 2008) proved that *two parallel effects of different directions prevail in the formation of the market price*. One is the upward price mechanism, when the change of raw milk prices induces price changes in the processing and retailing stages. However, in the oligopolistic market there is a downward price mechanism as well.

¹ Since the limitation of the length of present paper we do not go into details of the Hungarian milk market. Description of the Hungarian dairy sector in English and further references can be found for example in Popovics – Tóth 2005; Popovics 2007, 2008; Szabó G.G. – Bárdos 2005a, 2006).

The reason for this development is the effort of the commercial sector that forces processors and farmers in a price taker position. The latter puts raw milk producers in a vulnerable position; as a consequence, they get the worst of the fight for favourable prices. The problem stems from two things. One is that milk is a perishable product; therefore there is no way to retain or to stock it. The other is historical, i.e. Hungarian producers are unwilling to join forces and establish effective co-operatives. However, if farmers integrated in bigger organizations, they could reduce the transaction costs per unit that would improve their profitability position.

We assumed that price transmission between the retail and the production stages is imperfect, i.e. price changes in the production stage are not transmitted properly in price changes in the consumer stage. We tried to answer the following questions:

1. Within the sector, significant realignments have taken place. It is worth examining, which participant within the sector starts this realignment.
2. Is there an unambiguous relation between the different prices in the stages of the chain? If there is, which is the price that moves the others?
3. We examined how producer price influences prices in other stages, and to what extent these changes are market-like.
4. Are the price changes symmetric, do the prices in the retail stage change at the same rate as prices changed in the production stage, or they increase the asymmetry in the sector? How long does it take the price effect to pass through?

We neither analysed the factors that increase or decrease producer prices, nor we wanted to decide whether the distribution of profit between the stages is fair or unfair. Our analysis tries to reveal at what rate the price changes between the specific stages are influenced by the effectiveness of their market functioning.

To solve these problems, we have conducted an *econometric analysis*: we adapted a *linear autoregressive model* using a time series of price data showing changes at national level.

To decide whether an asymmetric price transmission prevails, we assumed the price correlations from the model by Kinnuchan and Forker (Kinnuchan - Forker, 1987; Tóth, 2003). The characteristics of marketing costs are excluded from our analysis, as we do not analyse whether price margins between the output prices are market-effective, but the appearance of price changes in the following stage.

We would like to emphasize the *following results* that concern the functioning of the sector. The results obviously show that *price determination process moves upstream in the production-processing stage*. Consequently, it seems that the transmission of values is based on the value added, by summing up the production and processing costs. Thus, the value is *determined rather by the production than by the market*. However, the prices of the retail stage are determined in the consumer market (Mészáros – Popovics, 2004; Popovics – Tóth, 2006).

In addition, fragmenting the marketing sector for the analysis seems definitely necessary: *the characteristics of the production-processing stages are absolutely different from those of the retail stage*. This finding highlights that analysing only the production-consumer price relations is not sufficient.

3. Imperfections in the coordination mechanisms and the vulnerability of producers in the Hungarian dairy sector

The essential problem within the dairy sector is the issue of profitability and its distribution within the chain. Our earlier studies (e.g. Popovics – Tóth, 2005) revealed that producers are

in vulnerable positions in the chain; they can sell milk near the cost price. In such circumstances only large-scale enterprises can survive and small producers go bankrupt. Such changes in the firm structure can have serious social consequences. Many thousands might lose their living by this transformation taking place in the Hungarian dairy sector.

The *crisis of the Hungarian dairy sector can be traced back to the imperfections of the coordination mechanisms*. One reason is the *functional disorder of the national coordination mechanism* (necessary interventions by the government), the other is the *imperfect market (private) coordination procedures* e.g. lack of cooperatives, producers' groups (Szabó G.G. – Bárdos, 2005a,b, 2006).

The vulnerable position of the producers is made even worse by the fact that the dairy sector is oligopolistic and distorted. In order to be able to compete with the prices set by the commercial sector, the players in the lower levels of the chain act as price-takers. The problems are originated from two factors. One is that milk is a perishable product i.e. storage and stockpiling are impossible. The other is that, based on historical ground, *Hungarian producers are unwilling to join forces and establish effective business cooperation*.

As European (Danish, Holland etc.) and North-American examples show, if farmers integrated in bigger organizations, it would increase their lobbying power and reduce the transaction costs per unit, therefore improving their profitability position. (Szabó G.G., 2002; Szabó G.G. – Bárdos 2006).

In theory and according to Western European (Dutch, Danish etc.) and US practical experiences, one of the main important private institutions which can strength producers and help to co-ordinate (agricultural) chains is the co-operative form. Agricultural co-operatives used to be considered as the *classical form of co-ordination of different and independent farmers*. Co-ops were founded through a *voluntary base* (Meulenbergh, 2000) in order to protect members against the large commercial and/or industrial companies which are often in a monopolistic or oligopolistic position. They are very efficient marketing tools in a number of sectors, like fruit-vegetable and dairy branches.

The development of countervailing power – even only regionally - through the disposal of the milk collected by co-operatives and other producer-owned organisations can get results such as *strengthening market competition* (e.g. 'radiation effect' on prices).

The different coordination mechanisms improve and strengthen the bargaining power of producers by allowing for higher selling price and by eliminating price fluctuations. Furthermore, they can have other positive effects concerning not only the industry, but the whole society as well, such as benefits from the stabilized prices and supply or cheaper food prices via more effective organisation (Szabó M., 1999). Higher degree of co-operation among producers is important from the point of better coordination of the whole chain and it can enhance (consumer) welfare as well.

Regarding the whole society, the effect of developing and strengthening trust and social capital has primary importance apart from direct economic aims.

Approaching the above problems, Szabó G.G. and Bárdos K. carried out a postal survey among milk producers in the second quarter of 2005 (Szabó G.G. – Bárdos, 2005a,b, 2006). A total of 300 questionnaires containing closed and open questions were sent out for milk producers, 68 of them could have been evaluated. The results were structured, electronically converted for applying SPSS-software. The data was analysed by employing multivariate techniques (cluster analysis, linear regression, multidimensional scaling, etc). 7 hypotheses were grouped into three sections: ones related to governance structure, to contract features and to bargaining power-cooperation field (see Table 1 below). As results of the above empirical research, Szabó G.G. and Bárdos (2005a,b, 2006) found that two of the hypotheses had to be rejected, all the others were accepted as can be seen in Table 1.

Table 1: Summary of results and methods employed Szabó and Bárdos (2005, 2006)

		Hypotheses	Methodology	Result
Governance structure	I.	We can put farmers participating in homogeneous milk transactions into three, significantly different subgroups based on governance structure.	non-hierarchical clustering	✓
	II.	Variables regarding governance structure (asset specificity, bargaining power and contract determination) have a significant role in grouping/categorizing farmers in participating survey.	K-means clusters, F-tests	✓
	III.	The reason for changing partners is the same in subgroups as in the total sample	K-means clusters, comparing means	✓
	IV.	One or all of the variables that are significant in the formation of the subgroups significantly influence the contract period.	linear regression	X
Contract features	V.	Space composed by the whole set of variables of contracting features can be reduced to two or three dimensions and respondents can be separated on the basis of the reduced dimensions.	Multidimensional scaling	✓
	VI.	Change in bargaining power can be explained by the variations of contract features.	linear regression	X
Bargaining power	VII	The volume of sold milk has a positive, significant effect on bargaining power.	linear regression	✓

Source: Szabó G.G. - Bárdos, 2006: p.78

The last hypothesis (VII) investigates the potential collaboration of producers, i.e. its theoretical results. The hypothesis of “significant and positive relationship can be found between the quantity of sold milk and bargaining power” was accepted.

Producers’ organizations (producers’ groups, co-operatives etc.) can be solutions and able to *increase bargaining power* in a number of cases, at least as marketing tools.

As a conclusion, we underline the *importance of Western-European (Danish, Holland etc.) experiences* and the need for more producer-owned organisations, like co-operatives and producers’ group in Hungary since we found that higher volume of milk sold has got an effect of better countervailing power. According to our results, we have to point out the role of co-operatives and producers’ groups in integrating small, individually weak agricultural units.

As a main body of our study we summarize the strengths, weaknesses, opportunities and threats of the different coordination structures in the frame of a SWOT analysis, assuming two theoretical situations: one is when the coordination is initiated by the processor or when it is established by the farmer.

4. Possible ways of establishing private (market) coordinating organizations in Hungary²

Due to limitations in human resources (e.g. skills and motivation to start and run a private business) and the shortage of financial and social capital, the establishment of privately initiated organizations was and still is slow and difficult. Although the vertical integration is maintained by the possibilities of mutually achievable benefits, we have to admit that the *different aspects are of different importance for market participants*. The participants at *different levels of the chain* (producers, processors, retailers) have *different approaches* towards economic benefits; therefore, in the more and more competitive market conditions contrary to the mutual benefits, they might act as if they were enemies.

To maintain their competitiveness in the enlarged European market, the individual producer groups have to exploit the opportunities offered by the integration. According to their financial situation, they have *two possibilities*:

1) The simplest way is to join an already established organization at a higher level of the chain. In this situation, the *expected benefits of producers* are the following: (Figure 1)

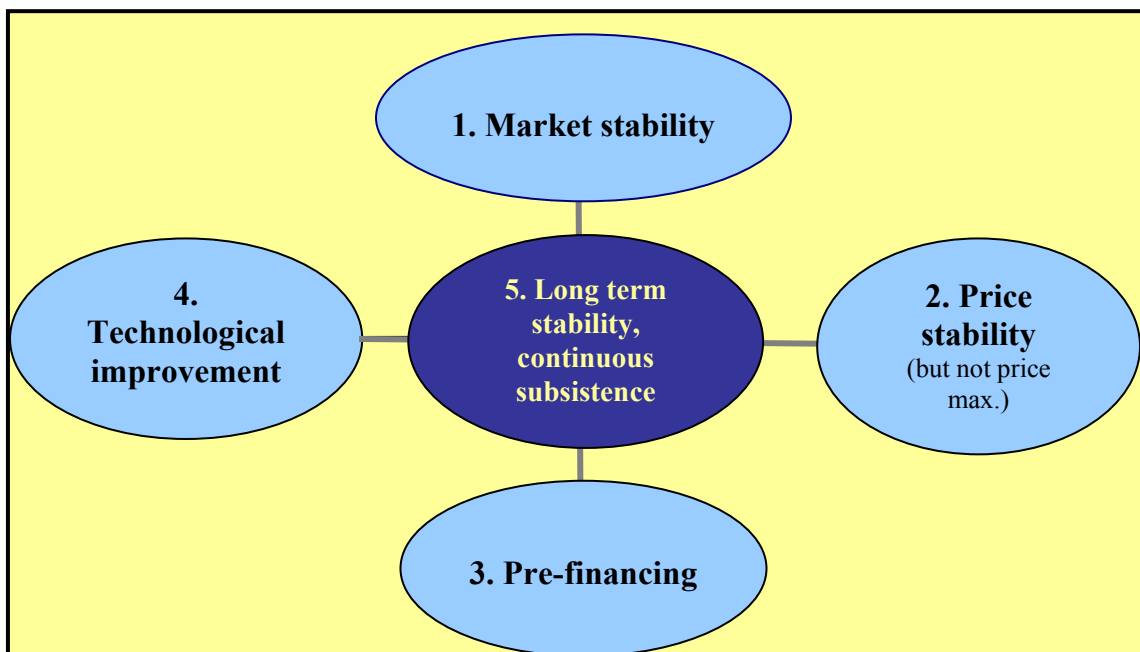


Figure 1: Possible benefits for producers originating from processor-initiated vertical integration

Source: Popovics, 2007b: p. 746

However, in this case the processors act as integrators and, although through the production system they and the farmers mutually depend on each other; because of the different balances of forces their relation stays imbalanced. The essential interest of the integrators is to continuously decrease the significant raw material costs, which often come out at 60-65% of the total costs. Thus, the behaviour of the integrators makes the position of

² If the processor is the initiator of the coordination, we talk about downstream coordination; if the farmer organization initiates the integration (e.g. Alföldi Milk Ltd.) it is called upstream coordination.

farmers more complicated. In such a relation, the bargaining power and interest enforcement possibilities of farmers stay weak.

SWOT analysis of the coordination structure established by the processor (as initiator) from the farmers' point of view can be seen in Table 2.

Table 2: SWOT analysis of the coordination structure established by the processor

Strengths	Weaknesses
<ul style="list-style-type: none"> • decreasing transaction costs; • cost effectiveness of the production stage can be enhanced; • more assessable, more secure market through long term contracts; • more-or less-balanced prices guaranteed in contracts; • the processor takes part in ensuring the current assets of farmers through pre-financing • long term stability, permanent subsistence; • bad quality products are filtered out by the system; • transportation is organised and financed by the integrator. 	<ul style="list-style-type: none"> • the different market power causes imbalanced relationship between the integrator and the farmers; • the integrator is interested in cost cuts (raw materials, pre-financing current assets etc.); • price-asymmetry; • the integrator might arbitrary change the contract; • bargaining power and the interest enforcement of farmers remain weak.
Opportunities	Threats
<ul style="list-style-type: none"> • easier technological and product development; • better flow of information; • food safety is ensured via central control and monitoring. 	<ul style="list-style-type: none"> • milk is a perishable product, that leads to opportunist behaviour of the contracting partner; • hold-up (relationship) problem based on the vulnerability of farmers because of functional investments.

Source: Popovics, 2008: p. 68 based on Szabó G.G. - Bárdos, 2006; Szentirmay - Gergely, 2005

It is very important to emphasize hold-up problems in case of co-ordination offered and led by the processor. The *hold-up problem*, probably the most known example for ex post problem/cost, relevant in agriculture, "... arises when one party in contractual relationship seeks to exploit the other party's vulnerability due to relationship-specific assets" (Royer 1999, p. 49). The hold-up problem is significant in the dairy and fruit-vegetable sectors, explaining the existence high share of co-operatives in these industries (Staatz, 1984; van Bekkum and van Dijk, 1997; Kyriakopoulos, 2000). The *members of a marketing co-operative are not likely to fear* that after investing into relationship-specific assets, the other party (e.g. the processor or wholesaler) will change its mind and force them to accept lower prices for their products otherwise terminate their contractual relation. (Szabó G. G., 2006)

2) To avoid the disadvantages mentioned above and utilizing the power of self-organising, farmers establish so-called promotion-type, facilitating (e.g. marketing) co-operatives, in order to create a countervailing power against the monopolistic commercial and industrial

corporations. In this study we use the *basic USDA co-operative concept* which reflects three basic criteria: "A cooperative is a user-owned and user-controlled business that distributes benefits on the basis of use" (Barton, 1989: 1). According to the above definition *three main relations* exist between the member and the marketing co-operative: the *product*, the *capital* and the *democratic managing-control* line. The co-operative does not produce the raw material.

The dairy co-operatives in Western Europe are specialised to process and sell the milk and milk products of their members. The most important types are the milk collecting-, bargaining- and marketing-co-operatives. They use *long, medium and short term contracts* to secure the raw material for them and to be able to govern the whole marketing chain. The co-operative, *in the modern sense, is a hybrid formula*, because apart from the common property the members sign a special "contract": the statute or bylaw, which are the formal legal guarantees that the co-operative will never act against the members (hold-up problems usually are not as significant as in the case of processor initiated coordination structure), and on the other hand that members will enjoy their advantages and fulfil their duties.

The recent co-operative literature (see Szabó G.G., 2006 for a review) emphasizes the following *potential incentives* for the establishment of *co-operatives as a form of vertical integration on the basis of Transaction Cost Economics considerations*. *First*, co-operatives traditionally can provide *access and secure markets* for the long term, therefore give *protection for independent farmers* against the large commercial and/or industrial companies. They can also carry out *services otherwise not or available at very high costs*. *Second*, co-operatives *build up countervailing power* and above a certain economics of scale they act as *competitive yardstick* for non-co-operative, conventional firms and the whole sector with a *better influence on the market and prices*. *Third*, co-operatives in some cases can *increase technological and market efficiency* and carry out activities with a *higher added value*. *Fourth*, co-operatives can *decrease and internalize transaction (information) costs*, with a better flow of information on consumer demand - closer proximity of consumer to farmer and with a unified decision role between two or more levels of the marketing channel. The co-operative can also *lowering both economic and technological uncertainties* therefore decrease transaction costs. To *avoid (ex post) hold-up problems* in the case of perishable products and different types of asset specificity is also a main reason to use a co-operative as a governance structure. *Finally*, co-operatives can *increase the income of the members* above by lowering transaction and production cost, by *reimbursement of the surplus for the members made at another level* of the marketing channel.

In addition to economic aims, there are *several non-economic reasons* (Szabó G.G., 2006), which can also be important for the successful development of co-operatives (Hakelius, 1996). First, co-operatives used to be considered as organised trust, which can determinate the success or failure of a certain co-operative: "Trust (between the member and co-operative, authors) is a major co-operative advantage" (Spear, 1999). Second, the social and informal network of members or potential members is also relevant as a determining factor in decreasing transaction costs and in the process of establishing and the running of the activity of a co-operative. Better knowledge and confidence (Røkholt, 1999) among members is vital to how co-operatives can be highly efficient in terms of the management of human relations. Stryjan (1989) deals with organisational consequences of different membership and ownership issues in his seminal book, which also emphasises the human or "soft" side/way of organising activities and thus organisations.

The above type co-operatives are the *first step towards structural improvement*. The primary goal is to ensure their raw material in the market by better bargaining power through the increased product volume (by fighting for the highest possible price), and to increase the market share.

SWOT analysis of the coordination structure by the farmer (as initiator) from the farmers' point of view can be seen in Table 3:

Table 3: SWOT analysis of the coordination structure established by the farmer

Strengths	Weaknesses
<ul style="list-style-type: none"> • decreasing transaction costs; • cost effectiveness of the production process can be enhanced; • lower technological and market risks; • more influence on the market and on prices; • cost savings through the shortened flow of information; • rearranging some of the profit from a certain level of the marketing chain to farmers; • better interest enforcement , better bargaining position; 	<ul style="list-style-type: none"> • inexperienced management; • inexperienced independent marketing activity; • members often have to cope with shortage of capital, therefore the investment structure is not optimal; • the current assets of the farmers have to be financed under their own capital; • members often cannot recognise that investments serve their interest – internal conflicts (horizon problem); • contact with the co-operative, transparency of its operation and practicing their managing and controlling role might cause problems for members; • ensuring food safety, quality control • weak logistics
Opportunities	Threats
<ul style="list-style-type: none"> • accessing and retaining new markets; • high value added activities. 	<ul style="list-style-type: none"> • shortage of capital; • technological and product developments are not materialised; • some members might gain benefits without paying-in (“free rider” symptom); • the co-operative is sometimes unable to control the quality and quantity of the supplied product; • milk is a perishable product.

Source: Popovics, 2008: p. 69 based on Szabó G.G., 2002

Though the hold-up problems usually are not as significant as in the processor-initiated case, agency problems still might occur in co-operatives (Szabó G.G., 2006; Fertő - Szabó, G.G. 2002). As a very closely related issue to TCE and the (democratic) decisionmaking process, there are a number of *potential problems of the traditional (countervailing power) co-operative model* (van Bekkum and van Dijk, 1997; Nilsson, 1998b) according to the *agency theory* (Nilsson, 1998a; Cook, 1995; Vitaliano, 1983). Based on the incomplete contract assumption, the *agency theory concentrates on incentive and measurement* problems featuring the *individual* and not focuses on the transaction which is the basic unit in TCE (Mahoney, 1992; Royer, 1999). The basic source of the agency problems of *complex organizations is the separation of ownership and control*. In the case of co-ops, the separation of the management (agent) and the owner-members (principals) can arise different incentives, therefore managers sometimes carry out business according to their objectives at the expense of the owners (Royer, 1999).

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 one can find the *common property problems* including external and internal free rider

problems, *horizon* and *portfolio* problems, which are connected to the member interest to invest into the co-operative. The *decision-making process agency costs* are relating to *monitoring* and *follow up the management activities*, as well to the *influence cost* acquiring if there are different groups with different interests in the co-op, and finally linked to *decision problem of the management* caused by large and heterogeneous membership with different priorities and opinion.

Cook (1995) employs a co-operative life-cycle model consisting from five stages, whereas on stage three he definite five problems. *The five inherent organizational problems of co-operatives* are the following: *freerider, horizon problem, portfolio, control and influence cost* problems.

Analysing the statements defined in both SWOT analyses, we find that *depending on the initiator of the coordination*, there are *significant differences between the strengths, weaknesses, opportunities and threats*. There are common points, since transaction costs decrease and production is more cost effective in both cases. However, some factors occur as a strength in one system and as a weakness in the other, e.g. quality. We cannot decide which organization is more beneficial, since the factors listed might include many subjective factors that make the judgement more difficult, furthermore, the development, fulfilment and emphasizing of the specific points might cause significant differences even for two similar organizations. However, we can claim that *in any organization* the key points of the successful coordination are *financial power, quality consciousness and professional management*; and these factors are included *as strengths in the case of processor-initiated coordination*.

We can only hope that the above types of co-operations would spread in Hungary. However, one thing is sure. Hungarian farmers have a lot to do to become real competitors of the EU's farmers. Their situation is made even more difficult by the fact that they also have to compete in the national market with foreign multinational companies and retail chains. The Alföldi Milk Ltd. has stepped on this road. Their story shows how theory is put into practice.

At the end of our paper we present a successful organisation the Alföldi Milk Selling and Supplying Ltd. which is a good example for the vertical integration based on the horizontal coordination of farmers as initiators. The Ltd. is an independent group of farmers, of which members co-operated not for production but for selling and marketing in order to establish market power against the monopolistic processors and retailers in the region, and to ensure the benefits of the members.

5. Case study of Alföldi Milk Selling and Supplying Ltd.

5.1. The funding and history of the Alföldi Milk Ltd.

The Alföldi Milk Ltd. is a *special type of cooperation operating as a producers' group in form of a business enterprise in Hungary*. It is a self-organised group of farmers, which members cooperate not for production but for selling purposes, in order to create the countervailing power against monopolistic commercial and processing players in the chain, and to help members benefiting from the membership. The Ltd. had 153 owner-members, as well as 427 employees at the end of in 2007. Only producers can be members, if the members sell their cows they membership are terminated automatically. The uppermost authority is the general assembly which is usually gathered together at least 4 times a year. Votes are distributed according to shares capital, so the traditional co-operative principle: 1 member – 1 vote does not apply in their case. However, the company can gain *similar advantages* (secured market, higher milk price, less vulnerability due to hold-up problems etc.) for their *members traditionally co-ops use to offer to their members!*

The process, which in April 2005 ended in the final (official) governmental recognition of the successful producers' group, *started in 30 April 2003*, when 23 big cattle farms, most from Hajdú-Bihar County funded the firm. The *objective* was to ensure a *profit higher than the Hungarian average*, by supplementing the income with 6% government subsidy. This amount reached 30 million HUF already in the first year for the milk purchased by Friesland Hungaria Joint-stock Company, and the company's turnover reached 516 million HUF.

The owner-members of the organisation have *300 cows/farm as an average*, i.e. most members of the cooperation are large-scale farmers. However, there has not been and there is *no minimum limit for milk delivery and small-scale farmers are also welcomed*. Already in 2004, the company had serious price negotiations, and was selling milk not only to Friesland Hungaria Joint-stock Company but to other processors as well, such as SOLE Hungary Joint-stock Company. Thus, the *company managed to utilize this market counterweight and could ensure prices for the members higher than the Hungarian average*. They applied for and won every year the subsidy provided for suppliers, which was maximized in 20 million HUF. These successes contributed to the fact that, by the end of 2004 the cooperation had already 83 members and 252 million l milk quota, which meant 9.6 billion HUF turnover.

5.2. Value added activities added: buying up the Parmalat plant in Székesfehérvár

By the end of 2006, the company has significantly extended. It supplied 7 processing firms with milk and its quota reached 400 million litres, which was *30% of the 1.4-1.5 billion litres national quota*. At that time the company had 153 members, its monthly turnover was near 3.2 billion HUF, which came out at 38 billion HUF per year (See Figure 2 below).

This fast and dynamic growth allowed for the *possibility of a vertical integration based on horizontal co-operation* (Markovszky, 2004). This process materialised in buying-up Hungarian processing firm earlier owned by Parmalat.

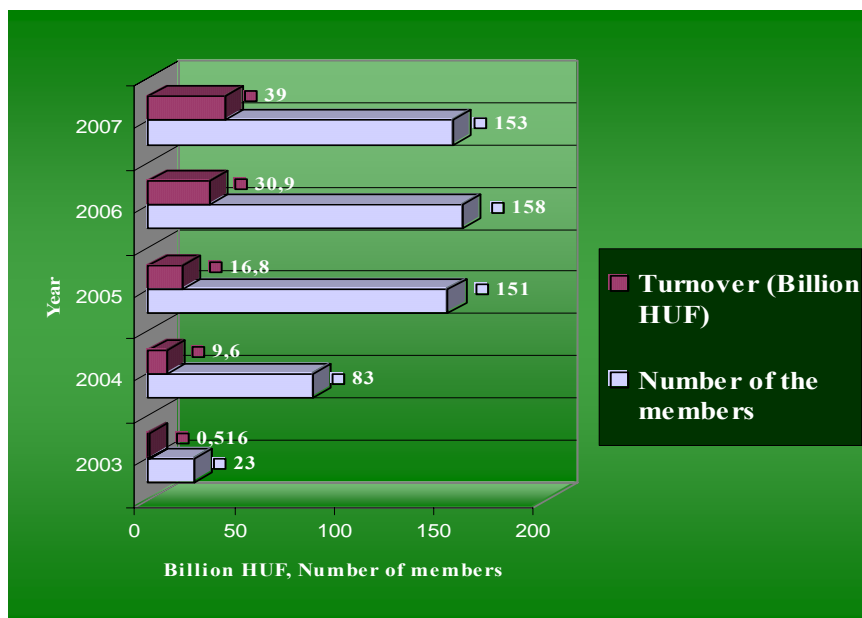


Figure 2: Dynamic growth of the Alföldi Milk Ltd.

Source: Annual reports of the Alföldi Milk Ltd.

The firm in Székesfehérvár was bought by Alföldi Milk Ltd. on 1st November 2005. According to Tibor Mélykúti (managing director of the company) in order to raise the

sufficient own capital to buy the Székesfehérvár firm, the members of the Ltd. had *increased the shared capital with 500 million HUF*. Furthermore, more than 4 billion HUF credit was borrowed, most of which was *granted by the state through the Hungarian Development Bank (MFB)*, and some were supplied from other credit institutions for a two-year loan period (Nagy, 2005).

The firm - earlier owned by Parmalat - being a farmer-oriented processing company functioned primarily as a *market regulating tool (puffer capacity)*, however in 2008 they process *83% of their raw milk in their own plant producing higher added value*. The Székesfehérvár firm, depending on its tied-up capacity, processes not only the milk produced by the members, but *also processes milk produced by other farmers*. The members see the benefits provided by the producers' group in the fact that through better bargaining power they can get better prices in the market. They are paid 1 HUF/litre more³ than the country average, which is a remarkable feat and strengthens members commitment.

5.3. Actual situation and future developments: plans⁴

Their *share of the Hungarian milk market is about 30%*, which is very important since 1/3 of the milk marketed on market is controlled by producers.

Regarding *profitability* in 2007, the plant has become profitable with the help of the above mentioned long-term loans and with the joint work of the management and Alföldi Milk Ltd., contrary to years 2005 and 2006. The profit of the plant was higher than 300 million HUF in 2007 contrary to the loss made in 2006 (250 million HUF).

The surprisingly strong Hungarian currency (HUF) was an advantage from the point of paying back loans, however since their *export get higher and higher share* in their turnover (their share from the exported Hungarian milk is about 1/3), it causes losses in the last few months. Their main export markets are Italy and Romania, but they are present in Slovenia, Germany, Slovakia, Czech Republic, Bulgaria and Cyprus as well.

Regarding *domestic markets*, they are *in every big retail chain* (hype- and supermarkets) with 160 products but some wholesale chains and EU export costumers are also their clients. They are not fully satisfied with the roles of the chains e.g. their price margin is too high, the quality of their products is sometimes very bad etc.. It is very important to take into consideration that *import of dairy products*, especially different types of relatively cheap cheeses, has been increasing since 2005. The share of import in the Hungarian market is about 25-30% depending on the seasonal surplus of milk in EU as well as on the current rate of the Hungarian currency (HUF). However, it is a relatively new phenomenon that at the same time there is a shortage of milk on the EU market which caused instability in contractual relations with fixed prices.

There was a *continuous increase in the domestic trading delivery prices* in the second half of 2007, however the profitability of processing activity has not changed since the surplus has gone to the producers (Alföldi Tej Kft., 2008). Their *main domestic processor partners* in 2007 are Sole-Mizo Joint-stock Company, Köröstej Ltd., M and M Sajtgyártó Ltd., Pannontej Joint-stock Company, Mark-Nagisz Ltd., Fino-Food Ltd. apart from their own processing activities.

Members use *HACCP* in their raw milk production and the processing plant also employs the same *quality assurance system*.

Commitment is relatively high among the owner-members due to the above average milk price paid as mentioned above, however last year (2007) some of them left (terminating their

³ The actually paid-out average price was 71.35/litre in their case compared to Hungarian average of 70.39 HUF.

⁴ This section is mainly based on annual reports (Alföldi Tej Kft., 2008) and on an interview (2008) in Hungarian with Bihari Gáborné (Auditor of Alföldi Tej Kft.).

contracts) for a little bit higher prices, therefore the number of members was only 153 at the end of 2007 contrary to 2006 (158). Since their violation of contracts, they can not be member again which will cause of a very hard situation for those individual producers on the Hungarian milk market. There is a non-member trade as well, they have got ad hoc agreements with the processing plant.

On short term future opportunities and tasks include:

- 1) re-creation of financial stability, decrease of banking costs,
- 2) increase suppliers' trust, saving liquidity of the firm,
- 3) strengthening market position regarding final products and export,
- 4) access to some support from EU and state,
- 5) product development, new packaging design in case of products with higher price margin,
- 6) communication and IT development between the producers' group and the processing plant,
- 7) modernisation of milk delivery and accounting system.

Long term strategies include enlargement of the group in logistically optimal regions of the plant and planned export activities, development of logistics and distribution system, modernisation of product assortment of the processing plant, as well as uniform handling of the total milk produced by the members.

6. Summary

Results of our price transmission analysis as well as our previous study on contractual relations in the Hungarian dairy sector obviously show that only the increase of input prices will increase the prices in the production-processing stage. *Farmers* are very *vulnerable* and they *cannot enforce their interest separately* and they are *not able act against the concentrated processing industry*.

It must be emphasized that the *problems of farmers and co-ordination of the dairy chain cannot be solved simply by EU and/or government support*, but it seems to be vital in the case of emerging *producers' groups, like co-operatives*, to be able to set up (Meulenberg, 2000).

As a main body of our study we *summarised the strengths, weaknesses, opportunities and threats of the different coordination structures in the frame of a SWOT analysis*, assuming two theoretical situations: one is when the coordination is initiated by the processor or when it is established by the farmer. *Analysing the statements defined in both SWOT analyses*, we found that depending on the initiator of the coordination, there are significant differences between the strengths, weaknesses, opportunities and threats. There are *common points*, since transaction costs decrease and production is more cost effective in both cases. However, *some factors occur as a strength in one system and as a weakness in the other*, for e.g. quality. However, we can claim that in any organisation the key points of the successful coordination are financial power, quality consciousness, and professional management, and these factors are included as strengths in the processor-initiated coordination.

As a conclusion, we underline the *importance of Western-European (Danish, Holland etc.) experiences* and the need for more producer-owned organisations, like co-operatives and producers' group in Hungary since we found that higher volume of milk sold has got an effect of better countervailing power. According to our results, we have to point out the role of co-operatives and producer groups in integrating small, individually weak agricultural units.

So, further establishment of the milk-collecting and the bargaining type co-ops and the development of existing dairy producers' groups would be essential for the Hungarian milk producers.

The *success story of the Alföldi Milk Selling and Supplying Ltd.* is a good example for the vertical integration based on the horizontal coordination of farmers as initiators. The existence, development and the efficient production of the business conducted by the producer owned organisation proves that *by co-operation of farmers there is a chance and opportunity to significantly improve their countervailing power and to establish ownership for farmers in the processing stage of the Hungarian dairy chain.* Higher degree of co-operation among producers is important from the point of *better coordination of the whole chain* and it can *enhance (consumer) welfare as well.*

Further studies on producer – processors relationship, as well as on developments of producers' groups and other coordination structures in the dairy sector would be useful to *help farmers, decision makers of agricultural policy and politicians* in order to establish a *more functioning chain with more value added activities* and a *more balanced distribution of profits* within the sector.

Regarding the whole society, the effect of *developing and strengthening trust and social capital* has primary importance apart from direct economic aims; therefore in our future research, we try to pay attention to the human/soft side of the coordination and co-operation issues.

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References

1. **ALFÖLDI TEJ KFT. (ALFÖLDI MILK LTD.) (2008):** Annual Report. (In Hungarian)
2. **BARTON, D. G. (1989):** What is a Cooperative? In Cobia, D. W. (ed.), *Cooperatives in Agriculture*. New Jersey: Prentice-Hall, Inc., 1-20.
3. **COOK, M.L. (1995):** The Future of U.S. Agricultural Cooperatives: A Neo-Institutional Approach. *American Journal of Agricultural Economics*. Vol. 77, December 1995, pp. 1153-1159
4. **FERTÓ, I. – SZABÓ, G.G. (2002):** Vertical Co-Ordination in Transition Agriculture: a Hungarian Co-Operative Case Study. Budapest: MTA KTK, Discussion Papers, New Series), MT-DP 10., 2002. 1-24 (<http://econ.core.hu/doc/dp/dp/mtdp0210.pdf>)
5. **HAKELIUS, K. (1996):** *Cooperative Values – Farmers' Cooperatives in the Minds of the Farmers*. Swedish University of Agricultural Sciences, Uppsala, Dissertations 23
6. **KINNUCHAN, H. W. - FORKER, O. D. (1987):** Asymmetry in Farm-Retail Price Transmission for Major Dairy Product, *American Journal of Agricultural Economics*, Vol. 5, pp. 285-292
7. **KYRIAKOPOULOS, K. (2000):** *The Market Orientation of Cooperative Organizations*. Assen: Van Gorcum.
8. **MAHONEY, J.T. (1992):** The choice of organizational form: Vertical financial ownership versus other methods of vertical integration. *Strategic Management Journal*. Vol. 13, No. 8, 559–584

9. **MARKOVSZKY, GY. (2004):** A termékpálya integrációk vizsgálatának lehetőségei (Possibilities of analysing of integrations in chains). *Gazdálkodás*, vol. XLVIII., nr. 3, pp. 25-32 (In Hungarian)
10. **MÉSZÁROS, S. – POPOVICS, P. A. (2004):** Price Transmission and its analysis in the milk and dairy sector: a survey. *Studies of Agricultural Economics*, No. 101, pp. 5-21
11. **MEULENBERG, M.T.G. (2000):** Voluntary marketing institutions in food marketing systems, in: van Tilburg, A., Moll, H.A.J., Kuyvenhoven, A. (Eds.), *Agricultural Markets beyond Liberalization*. Kluwer Academic Publishers, Dordrecht, pp. 213-233.
12. **NAGY, O. (2005):** A termelőké lett a tejüzem: A székesfehérvári Parmalat sorsa most a gazdálkodók kezében van (The dairy plant belongs to the producers. The fate of the Parmalat in Székesfehérvár is in the hands of farmers). *Magyar Nemzet*, Budapest 2005. november 4. p. 13. (In Hungarian)
13. **NILSSON, J. (1998a):** “Agency Theoretical Problems in Cooperatives,” *International Cooperatives Research Conference: “Values and Adding Value in a Global Context”*, 13-17 May, Cork, Ireland.
14. **NILSSON, J. (1998b):** The Emergence of New Organisational Models for Agricultural Co-operatives. *Swedish Journal of Agricultural Research*. Vol. 28, pp. 39-47.
15. **POPOVICS, P. A. – TÓTH, J. (2005):** Analysis of price transmission and the asymmetric effect of prices in the Hungarian dairy sector. *IAMO Forum, Halle (Saale)*, in CD, pp. 1-16 (ISBN 3-938584-02-5)
16. **POPOVICS, P. A. – TÓTH, J. (2006):** Az ártranszmisszió és az árak aszimmetrikus alakulása Magyarország tejvertikumában (Price transmission and asymmetric price development in the vertical structure). *Közgazdasági Szemle (Economic Review)*, LIII. évf., április, pp. 349-364 (In Hungarian)
17. **POPOVICS, P. A. (2007a):** A tejtermékpálya ökonómiai elemzése, különös tekintettel az ártranszmisszióra (Analysis of economic issues relating to the dairy sector, with emphasis on price transmission). *Ph.D. Értekezés (Ph.D. dissertation)*, DE ATC AVK Interdiszciplináris Társadalom és Agrártudományok Doktori Iskola 2007, 150 p. (In Hungarian)
18. **POPOVICS, P. A. (2007b):** *Producer Organizations to cure vulnerability of the Hungarian dairy farmers*. Collection of papers of International Scientific Conference: Agrarian Prospects XVI. Sustainable development of an agrarian sector – challenges and risks. Prague, 2007 Second part, pp. 743-753
19. **POPOVICS, P. A. (2008):** Analysis of economic issues relating to the dairy sector, with emphasis on price transmission. *Applied Studies in Agribusiness and Commerce – APSTRACT*. Agroinform Publishing House, Budapest. Vol.2. Numbers 1-2/2008.
20. **RØKHOLT, P.O. (1999):** Strengths and weaknesses of the co-operative form; A Matter of Perspective and Opinion. Paper presented at the *ICA International Research Conference*, Quebec, 28-29 August 1999 (manuscript)
21. **ROYER, J.S. (1999):** Co-operative Organisational Strategies: A Neo-Institutional Digest. *Journal of Cooperatives*. Vol. 14, pp. 44-67
22. **SPEAR, R. (1999):** The Co-operative Advantage. “*ICA European Research Conference on Continuity, Transition and Renewal: New Trends in European Cooperation*”. Weimar, October, 1999, 1-12 (manuscript)
23. **STAATZ, J.M. (1984):** A Theoretical Perspective on the Behaviour of Farmers’ Cooperatives. Michigan State University, *Ph.D. Dissertation*.
24. **STRYJAN, Y. (1989):** *Impossible Organizations. Self-Management and Organizational Reproduction*. Contributions in Sociology, Number 83. Westport, Connecticut: Greenwood Press.

25. **SZABÓ, G. G. (2002):** A szövetkezeti vertikális integráció fejlődése az élelmiszer-gazdaságban (Development of vertical integration by co-operatives in the agri-food economy). *Közgazdasági Szemle* (Economic Review), XLIX. évf., március, pp. 235-250 (In Hungarian)
26. **SZABÓ, G.G. – BÁRDOS, K. (2005a):** Vertical coordination by contracts in agribusiness: an empirical research in the Hungarian dairy sector. (Szerződéses vertikális koordináció az élelmiszer-gazdaságban: empirikus kutatás a magyar tejszektorban). Budapest: MTA KTI, Discussion Papers New Series, 1- 38 (DP-2005/15) (<http://www.econ.core.hu/doc/dp/dp/mtdp0515.pdf>)
27. **SZABÓ, G.G. – BÁRDOS, K. (2005b):** Tejtermelők szerződéses kapcsolatai és piaci ellensúlyozó ereje Magyarországon: termelői tulajdonú szervezetek szükségessége (Contractual relationships and countervailing power of milk producers in Hungary: need for producer-owned organisations). *Élelmiszer, Táplálkozás és Marketing* (The Hungarian Journal of Food, Nutrition and Marketing) Vol 2, Nr.1-2, pp. 81-88. (in Hungarian)
28. **SZABÓ, G.G. – BÁRDOS, K. (2006):** Contracts in agribusiness: A survey in the Hungarian dairy sector. In: Bijman, J - Omta, S.W.F.- Trinekens, J.H.- Wijnands – Wubben, E.F.M. (eds.): *International agri-food chains and networks. Management and organization*. Wageningen Academic Publishers, the Netherlands, pp. 65-80
29. **SZABÓ, G.G. (2006):** "Co-operative identity"- a concept for economic analysis and evaluation of co-operative flexibility: The Dutch practice and the Hungarian reality in the dairy sector. *Journal of Co-operative Studies*, Vol. 39, No. 3, pp. 11-26
30. **SZABÓ, M. (1999):** Vertikális koordináció és integráció az Európai Unió és Magyarország tejgazdaságában (Vertical coordination and integration in the milk sector in Hungary and the EU). *Agrárgazdasági tanulmányok, Budapest, AKII, Nr. 9, pp.36-61*(In Hungarian)
31. **SZENTIRMAY, A. – GERGELY, I. (2005):** Vertikális integrációk az élelmiszer-gazdaságban (Vertical integration in the agri-food economy). *Gazdálkodás*. Budapest, vol. XLIX, nr. 2, pp. 63-71 (In Hungarian)
32. **TÓTH, J. (2003):** Aszimmetrikus árhatások az osztrák húsiparban – hazai tanulságokkal (Asymmetric price effects in the Austrian meat industry—lessons for this country). *Közgazdasági Szemle* (Economic Review), vol. L., April, pp. 370-380 (In Hungarian)
33. **VAN BEKKUM, O. F. - VAN DIJK, G. (eds.) (1997):** *Agricultural Cooperatives in the European Union*. Van Gorcum, Assen.
34. **VAN BEKKUM, O. F. (2001):** *Cooperative Models and Farm Policy Reform*. Assen: Van Gorcum.
35. **VITALIANO, P. (1983):** "Cooperative Enterprise: Alternative Conceptual Basis for Analyzing a Complex Institution," *American Journal of Agricultural Economics*, 65, pp. 1078-1083

Interview

1. **Bihari Gáborné** Auditor of Alföldi Tej Kft. (ALFÖLDI MILK Selling and Supplying LTD.), July 30, 2008