



SZENT ISTVÁN UNIVERSITY, Gödöllő

Management and Business Administration Doctoral School

Summary of the Ph.D. Thesis

**PRODUCER ORGANISATIONS' (POs') PROSPECTS OF
COORDINATING FRUIT AND VEGETABLE PRODUCERS,
ILLUSTRATED THROUGH THE EXAMPLE OF 'ZÖLD-TERMÉK'
COOPERATIVE**

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Gödöllő
2009

Doctoral School

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1. RESEARCH BACKGROUND, OBJECTIVES

In the European Union Producer Organisations (POs) are the key instruments for coordinating the fruit and vegetable sector. There were more than 1400 POs in the EU in 2004, coordinating about 34% of the fruit and vegetable production. The European Commission aims to increase this figure to 60% by 2013, so they had to introduce reforms. The EU regulation reforming the fruit and vegetable sector came into force on 1 January 2008. The main goal was to strengthen members' bargaining positions and make them use environmentally friendly production technologies on a wider scale. Every Member State had to elaborate on its own specific National Strategy which outlines the prospects of development in the fruit and vegetable sector, and list the goals of POs, including the means by which they could achieve them.

In 2008-2009 significant changes happened in Hungary, as on 30 April 2009 the recognition period for most of the POs having preliminary recognition expired. By the end of the maximum 5 year-long recognition period POs having only preliminary recognition have to comply with the requirements for recognition. If they cannot comply with the requirements, they have to join a recognised Organisation either by merger or fusion. Fifty-eight POs were operating in Hungary on 1 January 2008, eleven of which had recognition.

The reform urges POs to set up secondary cooperations (Associations of POs) that is again impossible without stable POs. The performance of Hungarian POs operating in the fruit and vegetable sector is well below the EU average. In 2007 PO members' turnover constituted only 16.5% of all the fruit and vegetable turnover so the reasons for this low standard have to be examined immediately. While marketing cooperatives in Western European countries are successful in coordinating product fields, the market share of Hungarian cooperatives is low. One of the reasons for this phenomenon may be the lack of trust between the producers and between the producers and their partners.

In the first part of the study I will introduce the coordinating mechanisms of the fruit and vegetable product field. By doing so, I will examine the process of coordination and its possible forms manifesting in the product field. Based on listed bibliography I will present Western European and Hungarian examples. The question is: to what extent and how POs can coordinate product fields. I will give an outline of the operational parameters of Hungarian POs and POs in other Member States. I will study the changes in the number of Hungarian POs, naming the direct and indirect reasons for the period of 1999-2008.

In order to gain a better understanding of the Hungarian characteristics and processes, I will analyse the operation and production of ZÖLD-TERMÉK Cooperative (a recognised PO) from its formation in 2003 until 2008. My analysis will focus on the role the cooperative plays in production coordination. In other words, I will examine the changes in the number of members, the size of cultivated

land, production structure, product types, turnover and payments, and how these factors affected members' production.

I will evaluate the role of trust in cooperation, relying on works of international and Hungarian researchers. By means of a questionnaire survey I will examine how trust affects group cohesion and members' performance and satisfaction at ZÖLD-TERMÉK Cooperative. I will also concentrate on membership's motivating factors, in order to understand the goals and expectations members have when they join the cooperative and remain members.

The conclusions drawn from the results of the questionnaires are mainly relevant to POs of the Southern Great Plain (*homokháti*) region.

Objectives

Illustrating the importance of the fruit and vegetable sector around the world, in the European Union and in Hungary.

Representing the coordinating mechanisms of agriculture, focusing on the fruit and vegetable sector.

Highlighting the role of POs in coordinating the fruit and vegetable sector both in the European Union and Hungary.

Through an example I will examine ZÖLD-TERMÉK Cooperative's role in coordinating producers, from the Cooperative's formation in 2003 to 2008.

In this primary research, based on the results of a questionnaire survey, I will analyse and evaluate the motivation level and goals of ZÖLD-TERMÉK Cooperative's members, and examine the impact trust had on their performance and satisfaction.

Hypotheses

I formed the following hypotheses concerning the questionnaire survey:

1. The PO provides secure marketing for members and reduces production costs.
2. PO members claim that secure marketing is more important to them than price.
3. Members with a higher educational level use the services provided by the cooperative more actively than those with a lower educational level.
4. Trust among members, and between members and management has a positive impact on group cohesion.
5. Trust among members, and between members and management has a positive impact on members' performance and satisfaction.

2. MATERIAL AND METHODS

My main objectives in this study were the theoretical foundation of my research and I was also focusing on collecting a wide range of primary data from the sector. I completed a case study about a Producer Organisation operating in the form of a marketing cooperative, and by means of a questionnaire survey I also examined its members.

2.1. A case study of ZÖLD-TERMÉK Cooperative

This study is based on ZÖLD-TERMÉK Cooperative's database and farming figures in the period of 2003-2007. The cooperative is based in Üllés, Csongrád county. It had been granted preliminary recognition on 25 August 2003, and on 1 January 2009 it became a recognised Production Organisation. Through a 5 year long period I will examine the annual changes in the size of membership, land, production, turnover and the product range, focusing on the correlations as well.

2.2. Questionnaire survey

The methods used for questionnaire analysis were grouped and described in the same order as the different topics appear in the questionnaire.

2.2.1. *Methods used for analysing questionnaire data*

Questionnaires¹ were filled in voluntarily and anonymously in the autumn of 2008. 57 out of the 99 members submitted a questionnaire at the cooperative's headquarters, indicating that 57.5% of members are represented in the sample. At the time the questionnaires were posted there were 47 founding members and 52 non-founding members in the cooperative. Out of the 47 founding members 29 people answered my questions; the ratio was 28 out of 52 at the second group, so the sample represents 61.7% of the founding members and 53.8% of non-founding ones. Almost all members (89 people) are from Csongrád county, only 10 members are farming in Bács-Kiskun county. Members are farming in 17 localities.

The main goal of this questionnaire survey was to explore cooperative members' opinions about the PO's operation. The questionnaire collected general data from members (company form, year of admission, age, experience in farming, educational level). The size of cultivated land was used to determine the economic size of the holdings, with detailed description of the land used for fruit and vegetable cultivation, listing each product distinctively. I also asked members to disclose their income figures from fruit and vegetable production.

After general and demographic questions I inquired about the following: the reasons of joining the PO, did the PO come up to members' expectations, the reasons for marketing through the PO. Respondents had to evaluate the given statements on a scale of 1-7, with respect to the validity of the statement and

¹ In the interest of comparability of the answers in the survey Imre Fertó gave me the questionnaire that was used by Bakucs et al. (2007, 2008).

whether they agree with the statement or not. I used an independent two factor T-test (with 95% reliability) to check if there is any statistical difference between the answers of founding and non-founding members.

I examined how often members used the services provided by the cooperative (activity).

I studied the role of trust within the cooperative, focusing on the impact it had on group cohesion, performance and satisfaction. Subjects had to evaluate the given statements on a scale of 1-7, indicating to what extent they agree with the statements.

Answers were analysed with the help of descriptive statistics and methods using multiple variables. Data were analysed and evaluated by means of Microsoft Excel and SPSS programmes. The collected data was analysed by frequency distribution and was transferred into cross tables. I also conducted significance analyses. Factor analysis was used to examine the latent structures behind the reasons for joining the cooperative, the results of which formed the basis of the cluster analysis of joining members. With the help of Pearson's Correlation I studied the strength and characteristics of correlations between the different factors (year of admission, age, experience in production, educational level, economic size of the holdings, activity, services used, future plans etc.). I applied hierarchical regression analysis to determine the level of impact trust had on group cohesion, performance and satisfaction.

2.2.2. Analysing respondents' demographic and farming characteristics

I characterised cooperative members by means of descriptive statistical methods with regard to company form, age, farming experience, educational level, and land size. I also studied how important fruit and vegetable production was in terms of members' income (for the period of 2005-2007).

2.2.3. Analysing the reasons for joining the cooperative

I examined the reasons for joining the cooperative with the help of nine questions. First, answers were evaluated with descriptive statistics, then I explored the latent structures behind the reasons given by the members. Following the factor analysis only seven out of the nine elements were used in the final model, which were grouped into two factors. Based on the factor scores I received in the factor analysis I carried out the cluster analysis in two steps. First, I finalized the possible number of clusters (there were four) by means of hierarchical cluster analysis, then I employed the method of K-Means on them.

2.2.4. Analysing the fulfilment of the cooperative's objectives

With the help of 13 questions I enquired about members' opinion on the fulfilment of the cooperative's objectives. The first 9 questions aimed to explore the reasons for joining the cooperative, so I was able to compare each reason with its truth content. Answers were evaluated by means of descriptive statistics.

2.2.5. Analysing the reasons of marketing through the cooperative

I asked 13 questions to examine the reasons of marketing through the cooperative. The answers given at ZÖLD-TERMÉK Cooperative were evaluated with descriptive statistical methods. I compared Bakucs et al.'s² (2008) results from MÓRAKERT Cooperative to the results of ZÖLD-TERMÉK Cooperative, and used the comparison to determine cooperative members' most important reasons of marketing through the cooperative. Like in the case of the reasons for joining the cooperative the latent structures behind the reasons were analysed with factor analysis. However, this time factor analysis failed because following the process of clearing the factor space, only less than 5 elements remained. Cluster analysis helped casting respondents into different groups which were set up in accordance with the different reasons. After the hierarchical cluster analysis I applied the method of K-Means for two, three and four clusters but none of them could be interpreted unambiguously, so I did not include the results of this analysis in my survey.

2.2.6. Analysing cooperative members' activity

I aimed to explore the activity level of cooperative members by examining how often they used the different services available at the cooperative (production organisation, procurement of input materials, production technology counselling, taxation and audit counselling, waste management). I assigned a number to each answer: yes, regularly (4), yes, occasionally (3), no, but intend to (2), no, and do not intend to (1). The question refers to five types of services so the answers outline the activity level of the producers. Higher scores refer to a higher activity level.

In the correlation analysis of members' highest educational levels I assigned a number (on a 7-item scale) to each educational level: less than eight classes finished in primary school (1), primary school (2), vocational school (3), secondary school (4), grammar school (5), college (6), university (7). Based on the Standard Gross Margin (SGM 2004) values assigned to the different fruit and vegetable products I estimated the economic size of the holdings and cast them into 4 groups by means of quartiles. The economic size of the holdings in this case means basically members' fruit and vegetable produce, for I did not have any data concerning production structures and animal stock.

The correlations between cooperative members' activity and demographic and production features were examined with Pearson's Correlation.

² Bakucs, L. Z. - Fertó, I. - Szabó, G. G. (2008): Mórakert Cooperative: A successful case of linking small farmers to markets for horticultural produce. In: Csáki, Cs. - Forgács, Cs. (szerk.): *Restructuring Market Relations in Food and Agriculture of Central and Eastern Europe: Impacts upon Small Farmers*. Budapest: Agroiinform Kiadó 207-249. p.

2.2.7. The impact of trust on group cohesion, members' performance and satisfaction.

With the help of eight questions I examined trust's role in the cooperative, focusing on its impact on members' performance and satisfaction. The analysis and the subhypotheses were based on Hansen et al.'s³ (2002) and Bakucs et al.'s⁴ (2007) research. I used hierarchical linear regression analysis to examine trust's impact on group cohesion, members' performance and satisfaction.

I used the following subhypotheses in examining my hypothesis concerning group cohesion (hypothesis 4 of the objectives):

- a) Trust among members (cognitive and affective) has a greater impact on group cohesion than trust (cognitive and affective) between members and management.
- b) Affective trust among members has a greater impact on group cohesion than cognitive trust among members.
- c) Affective trust between members and management has a greater impact on group cohesion than cognitive trust between members and management.

The following subhypotheses were employed in the analysis of my hypothesis concerning members' performance and satisfaction (hypothesis 5 of the objectives):

- a) Both types of trust (cognitive and affective) on both levels (among members and between members and management) have a positive impact on members' performance and satisfaction.
- b) Affective trust (on both levels, among members and between members and management) has a greater impact on members' performance and satisfaction than cognitive trust (on both levels, among members and between members and management).
- c) Group cohesion has a positive impact on members' performance and satisfaction.

³ Hansen, M. H. - Morrow Jr, J. L. - Batista, J. C. (2002): The impact of trust on cooperative membership retention, performance, and satisfaction: an exploratory study. *International Food and Agribusiness Management Review* 5, 41-59. p.

⁴ Bakucs, L. Z. - Fertő, I. - Szabó, G. G. (2007): The impact of trust on cooperative membership performance and Satisfaction in the Hungarian Horticulture. *Studies on the Agricultural and Food Sector in Central and Eastern Europe*. Volume 44 382-392. p.

3. RESULTS

In presenting the results I followed the order set up in Chapter 2: Material and Methods. Due to limited space, I focused only on the main characteristics of ZÖLD-TERMÉK Cooperative in the thesis book.

3.1. The most important characteristics of ZÖLD-TERMÉK Cooperative

ZÖLD-TERMÉK Producer Organisation produces fruit and vegetable on some 150 hectares of land, providing members with 2100-2600 tons of produce annually. Its most important products are the different kinds of pepper (paprika), cabbage, tomato, potato and root crop. The cooperative's main profile is forward farming. 60% and 40% of its products are marketed in the Hungarian and foreign markets, respectively. The cooperative's annual net income in 2007 was more than HUF 429 million, which was good enough for the 27th place (based on data about 55 POs, provided by the Court of Registration).

3.2. Results of the questionnaire survey (primary research)

3.2.1. Demographic and farming characteristics of the respondents

By means of descriptive statistics I defined the representative parameters of the average cooperative member: he/she is 45 years old, had been in the cooperative for more than 4.5 years and has 17.5 years of farming experience. 77% of his/her income comes from fruit and vegetable production. Size of land cultivated varies on a wide scale, ranging from 0.12 to 15 hectares, however, the majority of members are farming on less than 2 hectares. The area used for forward farming is less than 0.5 hectares.

I found that the average **founding member** is older than other members (49.5 years old), spent more time with farming (20.1 years) but has a lower educational level (3.62). Members who joined the cooperative later (**non-founding members**) are younger (41.0 years old), have less experience in farming (14.67 years) but have a higher educational level (4.21).

The independent two factor T-test (with 95% reliability) indicated a significant difference between the average scores of age and farming experience. In case of educational level the difference was almost significant.

3.2.2. The reasons for joining the cooperative

The principal motivation for joining the cooperative was secure marketing, as it is indicated by the highest average score as well (5.67). **The second most important motivation was the reduction of production risks** with 4.63 points; **in the third place there is the need for common procurement of input materials** with 4.56 points. Production coordination in accordance with market demand (4.38 points) and the need of belonging to a community (4.30 points) were motivations with strong mediocre importance. Access to production technology counselling was less than a mediocre motivation at the time of the admission (3.87 points).

Surprisingly, the predictability of market prices was only the seventh motivating factor. Application of environmentally friendly production technologies came right before the need for taxation and audit counselling, scoring 3.58 and 3.48 points respectively (Table 1).

Table 1. Reasons for joining the cooperative, for all members

Ranking	reasons	Average	Dispersion	Relative dispersion	Number of elements
1	Secure marketing	5.67	1.45	0.26	55
2	Reduction of production risks	4.63	1.83	0.39	52
3	Common procurement of input materials	4.56	1.86	0.41	52
4	Production coordination in accordance with market demand	4.38	2.02	0.46	53
5	Need of belonging to a community	4.30	2.04	0.48	53
6	Production technology counselling	3.87	1.93	0.50	53
7	Predictability of prices	3.77	1.88	0.50	53
8	Application of environmentally friendly production technologies	3.58	1.92	0.54	52
9	Taxation and audit counselling	3.48	2.09	0.60	52

Source: own survey

The independent two factor T-test (with 95% reliability) indicated a significant difference between the average scores of founding and non-founding members, with regard to taxation and audit counselling and application of environmentally friendly production technologies. In both cases founding members better appreciated the factors listed above.

Factor analysis of the motivating reasons for joining the cooperative

In the first application of the factor analysis I employed all 9 reasons. The communality of input material procurement was low (0.159) so it was emitted in the next test. In the second application the communality of the 8 factors was satisfactory, but it would have proved difficult to attach meanings to the factors so I rotated the factor matrix. As a result, only production coordination belonged to both factors so I emitted this factor as well and ended up with 7 factors. The result of the factor analysis applied for 7 factors was two factors, which managed to explain 57.485% of the information content (variance) of the original variables (Table 2).

Table 2. The information content of the factors

Factor	Unrotated factors			Rotated factors*		
	Eigenvalue	Variance (%)	Cumulative variance (%)	Eigenvalue	Variance (%)	Cumulative variance (%)
1	2.873	41.037	41.037	2.145	30.640	30.640
2	1.151	16.448	57.485	1.879	26.845	57.485

Notice(*): in case of Varimax rotation

Source: own survey

The Kaiser-Meyer-Olkin (KMO) measure and the Bartlett-test indicates that there is a latent structure behind the seven reasons, and this structure could be analysed by factor analysis (the KMO index is more than 0.5 (0.743) and the significance of the Bartlett-test is less than 0.05 (0.000). The KMO index shows that the partial correlations are within acceptable limits, and the significance of the Bartlett-test indicates that variables in pairs are not independent. The Chi-square test result (9.245) and significance (0.322) adjust properly. On the basis of these results, the two factors satisfactorily described the space defined by the variables. The communality of the factors I received exceeded 0.25 in each case, meaning they preserved enough information from each original index's information content.

I rotated the factor matrix in order to get a better interpretation of the factors (Table 3). The first factor I received this way stands for 30.64% of the variance. The factor includes taxation and audit counselling, application of environmentally friendly production technologies, production technology counselling and the need of belonging to a community. This factor could be characterised with '**openness**', for it refers to an interest in previously unprecedented, or hardly achievable goals from the farmers' side. The second factor explains 26.85% of the variance. This factor contains the reduction of production risks, the predictability of prices and secure marketing; and it could be characterised as a factor '**striving for security**'. In case of both factors factor weights have positive influence on factor values.

Table 3. Rotated factor matrix and factor contents

Variables	Factors	
	1	2
Taxation and audit counselling	0.824	
Application of environmentally friendly production technologies	0.757	
Production technology counselling	0.681	0.267
Need of belonging to a community	0.543	
Reduction of production risks		0.875
Predictability of prices	0.314	0.717
Secure marketing		0.684

Source: own survey

Based on the results of the analysis, I attached the factor scores to the respondents and applied **cluster analysis**. Table 4 contains the coordinates of the stable cluster centres realised at the end of the K-Means cluster analysis. Those respondents belong to **Cluster 1** who do not think security and openness were the most important motivating factors for joining the cooperative. Those in **Cluster 2** claim both factors were important. Members of **Cluster 3** are more open but found the demand for secure marketing less motivating. On the contrary, respondents in **Cluster 4** are less open and are mainly motivated by security.

Table 4. Centres of the final clusters

Factors	Cluster 1	Cluster 2	Cluster 3	Cluster 4
‘openness’	-.79586	.80441	.44945	-.97849
‘security’	-.95284	.61899	-.65632	.77187
N	11	17	13	11

Source: own survey

To gain further results from the clusters I analysed the demographic and farming characteristics of cluster members (Table 5). Respondents in **Cluster 1** are generally younger, have less farming experience and have the lowest income ratio from fruit and vegetable production (68.48%). On the contrary, respondents in **Cluster 2** are the oldest and most experienced in farming. 83% of their income comes from fruit and vegetable production. Members of **Clusters 3 and 4** are of similar age and have similar amount of experience in farming. Respondents in Cluster 4 joined the cooperative later and have a higher education level than those in Cluster 3.

Table 5. Cluster members’ characteristics

Characteristics	Q.u.	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Average
Years of membership	year	3.70	5.29	5.31	4.09	4.73
Age	year	39.00	49.53	44.31	44.00	44.83
Farming experience	year	11.70	19.94	15.92	16.82	16.63
Total land size	ha	4.35	8.13	4.90	4.83	5.83
Income ratio of fruit and vegetable production	%	68.48	83.33	82.56	71.52	77.50
Educational level (1 lowest, 7 highest)	none	4.09	3.59	3.38	5.00	3.94
N	pcs	11	17	13	11	52

Source: own survey

3.2.3. Members’ opinion on the fulfilment of cooperative objectives

Providing secure marketing was the most successful cooperative objective (5.07 points). Since it was the most important motivating factor as well, I concluded that the cooperative came up to the expectations regarding secure marketing. Respondents selected **common procurement of input materials** as the **second best** objective (4.33 points). The objective in the **third** place: **production coordination improving the prospects of marketing** got better than average scores (4.13 points). Membership’s impact on members’ sense of security was judged moderately (3.98 points).

Table 6. Fulfilment of the cooperative’s objectives, as judged by cooperative members, for all members

Ranking	Cooperative objectives	Average	Dispersion	Relative dispersion	Number of elements
1	Make marketing more secure	5.07	1.63	0.32	55
2	Cut production costs by common procurement of input materials	4.33	1.96	0.45	54
3	By coordinating production improve the prospects of marketing	4.13	1.71	0.41	54
4	Provide the sense of security through membership	3.98	1.86	0.47	54
5	Reduce the risks of production	3.93	1.50	0.38	54
6	Cut production costs by production technology counselling	3.70	1.94	0.52	54
7	Improve administration work by taxation and audit counselling	3.57	1.96	0.55	54
8	Improve the reliability of marketing prices	3.54	1.50	0.42	54
9	Improve the prospects of marketing by applying environmentally friendly technologies	3.17	1.91	0.60	54

Source: own survey

Members claimed that the reduction of production risks (3.93 points) and cutting production costs by production technology counselling (3.70 points) were the least successful objectives. As for the role of counselling, it does not merely offer introduction to cost reducing production alternatives but prepares members to meet the strict requirements of regulations governing environment protection, plant sanitation and food safety. **Prices did not become predictable, and the prospects of marketing were not expanded by the application of environmentally friendly production technologies** (Table 6.).

As for income and profit, PO membership did not come up to the expectations. However, farmers still regard PO membership an advantage (Table 7.).

Table 7. Indexes measuring members’ success and satisfaction, for all members

Ranking	Cooperative objectives	Average	Dispersion	Relative dispersion	Number of elements
1	Satisfied with the services provided by the PO	4.61	1.64	0.36	54
2	PO membership should come up to my expectations	4.41	1.73	0.39	54
3	Members’ income from farming should increase	3.48	1.72	0.50	54
4	Members’ profit from farming should increase	3.19	1.58	0.50	54

Source: own survey

The independent two factor T-test (with 95% reliability) indicated a significant difference between founding and non-founding members concerning taxation and audit counselling and environmentally friendly production technologies. Founding members had a higher opinion of the two factors.

3.2.4. Reasons for marketing through the cooperative

The cooperative usually pays in cash immediately at delivery or within a few days in case of a bank transfer. Respondents think payment speed is very important to them (6.33 points). The scores for the short paying deadline were 46% higher than the scores price itself received (4.33 points). The size of the cooperative might bring out the beneficial effects of personal contacts as it is indicated by the members, who believe this is the second most important reason for marketing through the cooperative (5.37 points). Members had high opinion of the cooperative buying acceptable quantities of produce and state that trustworthiness is important as well. Flexibility at delivery received higher than average scores. The availability of other services such as counselling had a moderate motivating impact on members (4.15 points) so it is only the ninth reason. The availability of counselling was not a popular reason for joining the cooperative either, thus it seems that **it is not production but secure marketing that causes difficulties for members**. Nevertheless, 72% of the members either regularly or occasionally attend counselling on production technology. From the cooperative's point of view, it is necessary to provide counselling because in order to gain homogeneous products the management has to control members' production. The 4.00 points assigned to the reason 'no other option' indicates that there would be alternatives but they probably would not be enough to market all products.

Table 8. Reasons of marketing through the cooperative, for all members

Ranking	Reasons of marketing	Average	Dispersion	Relative dispersion	Number of elements
1	Payment criteria/speed	6.33	1.31	0.21	55
2	Personal contact	5.37	1.70	0.32	54
3	Acceptable quantity	5.25	1.51	0.29	55
4	Trustworthiness (trust)	5.09	1.69	0.33	54
5	Flexibility at delivery	4.89	1.49	0.30	55
6	PO deals with delivery	4.39	1.99	0.45	54
7	Price	4.33	1.47	0.34	54
8	Valid contract	4.30	2.18	0.51	54
9	Services, counselling	4.15	1.75	0.42	54
10	No other option	4.00	1.87	0.47	53
11	Habituation	3.81	1.75	0.46	54
12	Finances input/deposits	3.52	2.15	0.61	54
13	Appreciates (price premium) extra/bio quality	3.04	1.74	0.57	53

Source: own survey

Members think that habituation has less than a mediocre truth content (3.81 points), however, it was not rejected completely. In their opinion the cooperative is less than helpful in financing their input and in offering deposits, and is only moderately appreciative of extra quality, so members do not get price premiums (3.04 points). This is why these are not real motivating reasons for marketing through the cooperative (Table 8).

The independent two factor T-test (with 95% reliability) did not indicate a significant difference between founding and non-founding members' scores.

The comparison of ZÖLD-TERMÉK Cooperative and MÓRAKERT Cooperative with regard to marketing through the cooperative

Bakucs et al.'s (2008) results of MÓRAKERT Cooperative were compared to the results of ZÖLD-TERMÉK Cooperative (Table 9).

Table 9. The comparison of the reasons of marketing through the cooperative

Reason of marketing	ZTC * average	MC ** average	Difference	ZTC */ MSZ** %	ZTC * ranking	MC ** ranking
Payment criteria/speed	6.33	3.39	2.94	186.73	1	9
Personal contact	5.37	4.66	0.71	115.24	2	5
Acceptable quantity	5.25	5.36	-0.11	97.95	3	1
Trustworthiness (trust)	5.09	5.20	-0.11	97.88	4	4
Flexibility at delivery	4.89	5.30	-0.41	92.26	5	3
PO deals with delivery	4.39	2.59	1.80	169.50	6	12
Price	4.33	3.82	0.51	113.35	7	7
Valid contract	4.30	5.36	-1.06	80.22	8	2
Services, counselling	4.15	4.52	-0.37	91.81	9	6
No other option	4.00	3.34	0.66	119.76	10	10
Habituation	3.81	2.43	1.38	156.79	11	13
Finances input/deposits	3.52	3.41	0.11	103.23	12	8
Appreciates (price premium) extra/bio quality	3.04	3.16	-0.12	96.20	13	11

* ZTC=ZÖLD-TERMÉK Cooperative, ** MC=MÓRAKERT Cooperative

Sources: own survey, Bakucs et al. (2008)

Members of ZÖLD-TERMÉK Cooperative gave payment criteria 87% more points than members of MÓRAKERT Cooperative, mainly because the former pays immediately after delivery, while the latter uses an extended payment deadline. **Members of ZÖLD-TERMÉK Cooperative gave 'PO deals with delivery' 69% more points than members of MÓRAKERT Cooperative**, because producers at MÓRAKERT Cooperative have more land to cultivate and they could deliver their produce to markets that fall farther from them. Habituation received 57% more points from members of ZÖLD-TERMÉK Cooperative indicating that members are less active in searching for new marketing channels. It is also supported by the fact that **members of ZÖLD-TERMÉK Cooperative think there are fewer alternatives for marketing while members of**

MÓRAKERT Cooperative are more optimistic. Personal contacts got 15% more points and the importance of price got 13% more points at ZÖLD-TERMÉK Cooperative. Members of MÓRAKERT Cooperative give slightly better points to acceptable quantity, trustworthiness and the flexibility at delivery. **The existence of valid contracts were given 20% more points,** the role of other services and counselling was given 8% more points **at MÓRAKERT Cooperative.** Payment criteria, which was the most important reason at ZÖLD-TERMÉK Cooperative was only the ninth motivating factor at MÓRAKERT Cooperative, and the role of personal contacts dropped to the 5th place. **The best motivating factors for the members of MÓRAKERT Cooperative were acceptable quantity and the existence of valid contracts.** Flexibility at delivery (3rd place) and trustworthiness (4th) are similarly motivating as well. **The least important reasons were habituation, delivery and price premium at MÓRAKERT Cooperative.**

The results from the two cooperatives formed the base of my calculations concerning the reason averages, to which I assigned the subtotal of the ranking figures. I aimed to define those marketing reasons that are equally important to both POs (Table 10).

Table 10. The reasons of marketing – a summary

Reason of marketing	Average total	Ranking total	ZTC* ranking	MC** ranking
Acceptable quantity	5.31	4	3	1
Trustworthiness (trust)	5.15	8	4	4
Flexibility at delivery	5.10	8	5	3
Personal contact	5.02	7	2	5
Payment criteria/speed	4.86	10	1	9
Valid contract	4.83	10	8	2
Other services and/or quality of counselling	4.34	15	9	6
Price	4.08	14	7	7
No other option	3.67	20	10	10
PO deals with delivery	3.49	18	6	12
Finances production/deposits	3.47	20	12	8
Habituation	3.12	24	11	13
Appreciates (price premium) extra/bio quality	3.10	24	13	11

* ZTC=ZÖLD-TERMÉK Cooperative, ** MC=MÓRAKERT Cooperative

Sources: own survey, Bakucs et al. (2008)

The results indicate that **Production Organisations' main motivating factors for marketing through them are the purchasing of acceptable quantities of products, flexibility at delivery, trustworthiness and positive personal contacts.** Flexibility, payment speed and the existence of valid contacts may constitute further motivation for members. Less important factors are price, and the services and counselling provided by the PO.

3.2.5. *Analysing cooperative members' activity with respect to the services they use*

Table 11 lists the averages of available services in decreasing order. The table was constructed on the basis of the answers that were converted to numbers. Members were most likely to participate in input material procurement, and were least enthusiastic in managing waste in an environmentally friendly way and in attending taxation and audit counselling.

Table 11. Activity of cooperative members, for all members

Ranking	Reasons	Average	Dispersion	Relative dispersion	Number of elements
1	Common procurement of input materials	3.09	0.83	0.27	54
2	Production organisation	2.93	1.15	0.39	54
3	Production technology counselling	2.89	0.95	0.33	54
4	Waste management	2.69	1.15	0.43	54
5	Taxation and audit counselling	2.39	1.16	0.48	54

Sources: own survey

After comparing the activity of founding and non-founding members, it seems evident that **founding members are more active than non-founding members in every respect. It is also supported by Pearson's Correlation**, which indicates a weak negative significant correlation (-0.293) between non-founding members and the subtotal of activity scores. If we examine the individual services one by one, it is only procurement of input materials that has a weak significant correlation (-0.335).

I checked the correlation between other factors as well, but found significant correlation in only one case. The higher the educational level, the lower the need for production technology counselling is (-0.305), which implies that **fewer members with a higher educational level need counselling**.

There was no significant difference between years of membership, age, farming experience, the economic size of the holdings and activity. The connection between educational level and activity shows a negative correlation because this connection is not significant, so hypothesis 3 cannot be justified.

3.2.6. *The impact of trust on cooperative members' group cohesion, performance and satisfaction*

Based on the questions in Table 12. I studied the impact of trust on group cohesion and the role of trust in members' performance and satisfaction separately. In my study I distinguished cognitive trust from affective trust. The first three subhypotheses in Chapter 2: Material and Methods were used to explore the connection between trust and group cohesion, while with the help of the remaining three subhypotheses I examined the impact of trust on cooperative members' performance and satisfaction.

Table 12. The questionnaire’s statements concerning trust

<i>Statements concerning cognitive trust</i>
I used a business-like approach to determine if I could trust other cooperative members. (Cognitive trust among members)
I used a business-like approach to determine if I could trust the cooperative’s management. (Cognitive trust between members and management)
<i>Statements concerning affective trust</i>
I feel that other cooperative members are trustworthy. (Affective trust among members, 1)
I feel that the cooperative’s management is trustworthy. (Affective trust between members and management, 1)
I feel that other cooperative members trust me. (Affective trust among members, 2)
I feel that the cooperative’s management trusts me. (Affective trust between members and management, 2)
<i>Statements concerning performance and satisfaction</i>
My co-operative membership has resulted in increased profits. (<i>performance, satisfaction</i>)
<i>Statements concerning group cohesion</i>
Apart from the financial benefit I also have a sense of belonging to a community. (cohesion)

Sources: own survey

Trust’s impact on group cohesion

I analysed trust’s impact on group cohesion by means of hierarchical regression analysis. Variables were introduced in the following steps: 1) the three control variables (land size, membership years, highest educational level), 2) answers concerning cognitive trust among members, 3) answers concerning affective trust among members (1), 4) answers concerning cognitive trust between members and management, 5) answers concerning affective trust between members and management (1).

Subhypothesis 4/a was justified: **trust among members** (cognitive and affective) **has a greater impact on group cohesion than trust** (cognitive and affective) **between members and management**. Trust among members justified 26.5%, trust between members and management justified only 6.2% of the variance.

As for group cohesion, affective trust among members justifies 12.4% of the variance as opposed to cognitive trust’s 14.1%. On the contrary, the standardized regression coefficient (Beta) indicates that it is affective trust among members (0.574) that has a greater impact on group cohesion, not cognitive trust (0.384). The same applies to the final model as well; affective trust among members (0.814) has a greater impact on group cohesion than cognitive trust (-0.217). Consequently, **affective trust among members has a greater impact on group cohesion**, which justifies subhypothesis 4/b.

The results also justified subhypothesis 4/c: **affective trust between members and management has a greater effect** (6%) **on group cohesion than cognitive trust between members and management** (0.2%). I would like to emphasize the fact that in this case the variance of the examined factors is extremely low, and that the correlation between members and management is not significant.

In the final model (following step 5) which contains every variable, **only affective trust among members and affective trust between members and management is in a significant correlation with group cohesion. Affective trust** among members and between members and management **has a greater impact on group cohesion** than cognitive trust. Surprisingly, affective trust's direction between members and management is negative, so growing affective trust directed at the management decreases group cohesion. The model explains 39% of the complete variance.

The impact of trust and cohesion on members' performance and satisfaction

I again used hierarchical regression analysis to examine the impact of trust and group cohesion (an additional variable) on members' performance and satisfaction. The first five steps are the same as the steps in the previous analysis, but in this case I added the sixth step of group cohesion, which appears as an independent variable. In step 3 the answer concerning affective trust among members (2) was used in the final model, while in step 5 it was affective trust between members and management (2).

Subhypothesis 5/a states that both types of trust (cognitive and affective) on both levels (among members and between members and management) have a positive impact on members' performance and satisfaction. **The results justify the subhypothesis only partially** because cognitive trust between members and management explains only 1.9% of the variance and does not indicate significant correlations. Only affective trust between members and management shows a significant correlation in the final model, where all variables are present.

Subhypothesis 5/b is only partially justified by the result. **Affective trust represents a greater part** (24.9%) of the variance in members' performance and satisfaction than cognitive trust (13.6%). However, **as for trust among members**, it is **cognitive trust** (11.7%) that **has a greater impact** on members' performance and satisfaction not affective trust (7.3%). On the contrary, **affective trust** (17.6%) **between members and cooperative management is more decisive** than cognitive trust (1.9%). **The subhypothesis** claiming affective trust (on both levels, among members and between members and management) has a greater impact on members' performance and satisfaction than cognitive trust (on both levels, among members and between members and management) **was only partially justified**.

I justified subhypothesis 5/c: **group cohesion has a positive impact on members' performance and satisfaction**. Group cohesion stands for 9.4%, group cohesion and trust stand for 54.7% of the variance concerning members' performance and satisfaction.

3.3. New and novel scientific results

1. By means of a questionnaire survey I justified that **both founding and non-founding members' main motivation** for joining ZÖLD-TERMÉK Cooperative (a fruit and vegetable PO) **was secure marketing**. On the contrary, predictability of price was a less important motivating factor. I also proved that the **PO made marketing more secure for members, decreased production costs** by common procurement of input materials and **improved members' marketing prospects**.
2. Based on the survey I declared that the PO urges its members to market through the PO by **purchasing acceptable quantities** of products, **flexibility** at delivery, **trustworthiness** and positive **personal contacts**. Price is not as important as the factors mentioned above.
3. The survey justified that the PO can only offer alternatives to those farmers who would be able to produce quality products on their own, without the help of the PO. **The most important role of the PO is to build out various marketing channels**. Services provided by the PO may be of help to farmers but this is not the main reason for the PO's success.
4. By means of a questionnaire survey I proved that in ZÖLD-TERMÉK Cooperative **trust plays a decisive role in the development of group cohesion**. **Affective trust** among members and between members and management **has a greater impact on group cohesion** than cognitive trust.
5. By means of a questionnaire survey I justified that in ZÖLD-TERMÉK Cooperative **group cohesion has a positive impact on members' performance and satisfaction**. Furthermore, it is again **affective trust that has a greater impact** on members' performance and satisfaction, not cognitive trust.

4. CONCLUSIONS, SUGGESTIONS

The European Union's latest consolidated regulation governing the fruit and vegetable sector came into force on 1 January 2008. Only a year had passed, it is early 2009 at the moment, but based on the 2008 situation I do not see any chance of realizing the European reforms in Hungary. Despite the reform, the administrative load of Production Organisations is still increasing. Constant changes of law regulating PO operation makes planning difficult. Definitions of **activities financed by operation programmes are often unclear**, which makes it impossible to complete real tasks. They also attempt to measure PO efficiency by means of a **complicated index system that is difficult to interpret**. In spite of the fact that in theory the fruit and vegetable sector is one of the least governed sectors, **POs are overregulated**.

Based on the results of the Court of Registration's annual reports **in 2007, the net income of the 58 recognised POs in Hungary** (owing a recognition on 1 January 2008, including those with preliminary recognition) **exceeded HUF 43 billion. Data from 2007 indicate that about 35-40 POs could reach the minimal income level per member which is a requirement of recognition.** The total net income of these POs was HUF 36-38 billion in 2007.

If **POs** would strengthen their production and stabilize the size of their membership, they could move towards forming **secondary cooperations**. **There had been attempts in Hungary to form such cooperations but none of them was still successful in 2009.** The most aspiring attempt was DATÉSZ Ltd., founded in 2004, which at first supported its members by common procurement of input materials, common marketing and the development of a quality assurance system. In 2005 they launched the coordination of common marketing, but following an initial success period, it started to decline in 2007 due to constant changes in ownership and competition among members.

In 2009 they will set up a circle of POs which would be able to comply with the strict requirements for recognition. After this, **depending on geography or product types, POs would build out those connections that may lead to the formation of higher level secondary cooperations.** Learning from earlier experiences it would be **inevitable for POs to strengthen their existing secondary cooperations or bring new ones to life.**

The biggest obstacle might be the disability to overcome lack of trust and fear. It is typical of POs to protect their existing markets. In addition, the conflict of determining the means and the extent of financing a joint organisation might not easily be solved. I would like to emphasize the fact that PO leaders in Hungary know each other, owing to the existence of FRUITVEB Hungarian Interprofessional Organisation and Product Council for Fruit and Vegetable. This organisation arranges 6-7 business meetings a year, where PO leaders have the opportunity to meet in person (evolution of trust) and discuss current

professional questions regarding the market (market situation, financing, funds, bills). Representatives of both the Ministry of Agriculture and Rural Development and the Agriculture and Rural Development Agency (ARDA) attend these meetings regularly. Thus it seems evident that **the setting up of secondary cooperations between POs depends mainly on their leaders**, for they have the knowledge and influence required for the launching of such a cooperation. However, **it would be the duty of the Ministry of Agriculture and Rural Development (the Hungarian state) to find and deliver the suitable EU funds.**

The primary study I conducted at ZÖLD-TERMÉK Cooperative justified that **members' biggest motivation for joining the PO was the demand of secure marketing.** The **second** most important motivating factor was the **reduction of production risks**, while **common procurement of input materials came third.** Surprisingly, **the predictability of price and the need for production technology counselling were among the less important motivating factors.**

According to members, **the PO came up to the most important expectation, which was secure marketing and the reduction of production costs by common procurement of input materials.** On the contrary, production technology counselling did not reduce production costs and prices did not become predictable. Environmentally friendly production methods did not improve the prospects of marketing neither. On the whole, although **PO membership did not come up to members' expectations in terms of increased income and profit, its advantages are still considered to be positive.** This implies that members would be in a difficult situation outside the PO.

A PO is only profitable if its members keep on delivering after admission. By examining the reasons for marketing through the PO, using the results of ZÖLD-TERMÉK and MÓRAKERT Cooperative I concluded that **a PO can best motivate its members to market through the PO by purchasing acceptable quantities of products, being flexible at delivery, being trustworthy and by developing good personal contacts.** Flexible and quick payment and the existence of valid contracts are further motivating factors. **Price, counselling and other services provided are less important motivating factors than those mentioned above.**

At ZÖLD-TERMÉK Cooperative members found counselling and other services only moderately motivating, still, the majority of members attend them either regularly or occasionally. The analysis of cooperative members' activity level revealed that **founding members are more active than non-founding ones.** I also concluded that **the higher a member's educational level is, the less he needs counselling on production technology.**

The study also revealed that **a PO provides alternative solutions only for those farmers who would be able to produce quality products on their own, but have limited access to marketing channels.** It is also justified by the fact that members claim that the most important task of the PO is to provide secure marketing, that is,

to build out marketing channels. A significant factor of marketing requirements is the PO buying acceptable quantities from the producers. Members find production technology counselling less appealing, which may imply that they have the knowledge needed for production. At the same time POs have to provide an effective counselling system for their members because in marketing they have to comply with strict rules concerning the environment, plant sanitation and food production, and this would be impossible without the participation of members.

A PO has to represent the interests of its members (owners) maximally, and produce the demanded variety of products by means of coordinated and controlled production. It also has to provide the infrastructure for storage, refrigerant storage, processing and marketing. **The most important task of a PO is to provide secure marketing for its members, and when it is achieved, it could help them by providing various services for them.** A PO is a profit-oriented marketing organisation.

Producers' low willingness to cooperate is possibly due to lack of trust. In a questionnaire survey I justified that at ZÖLD-TERMÉK Cooperative **trust has a decisive impact on the evolvement of group cohesion.** More precisely, affective trust has a greater impact on group cohesion than cognitive trust. I found that **group cohesion has a positive impact on members' performance and satisfaction.** Furthermore, it is again affective trust that has a greater impact on members' performance and satisfaction, not cognitive trust. The greater effect of affective trust implies that the emotional foundations of an association and cooperation are stronger than tangible economic results. **A PO management may improve the cohesion within the cooperative by increasing its own trustworthiness and strengthening personal contacts (both among members and between members and management).** This way its members would be satisfied and stay cooperative members.

5. PUBLICATIONS IN THE TOPIC OF THE DISSERTATION

Scientific journals (foreign language)

1. **Dudás, Gy. (2007):** The operation of the Producer Organizations in the fruit and vegetable sector in the European Union. *Acta Scientiarum Poloniam. Oeconomia*. 2007. 6 (3) 23-31. p. ISSN 1644-5707
2. **Dudás, Gy. - Fertő, I. (2009):** The effect of trust on the performance and satisfaction of co-operative members at the 'ZÖLD-TERMÉK' Producer Organization. *Gazdálkodás*, 23. külökiadás (English special edition), 49-55. p. ISSN 0046-5518
3. **Dudás, Gy. - Takács-György, K. (2009):** Motivation factors for joining fruit and vegetable Producer Organizations (PO) from growers' viewpoint. *Hungarian Agricultural Research*, 2009. Vol.18, No.2. June 10-15. p.
4. **Dudás, Gy. (2009):** Reason of sale via co-operative from the aspect of farmers in case of two Producer Organisations in the Hungarian horticulture. *Annals of The Polish Association of Agricultural and Agribusiness Economists (SERiA)*. 2009. Vol.11, No.6. 27-31. p. ISSN 1508-3535

Scientific journals (Hungarian language)

1. **Dudás Gy. (2001):** Integrátorok és/vagy Termelői Értékesítő Szervezetek? *Kertgazdaság*, 33 (4) 48-53. p. ISSN 1419-2713
2. **Béládi K. - Kertész R. - Dudás Gy. (2009):** A mezőgazdasági termelők motivációi az állati termékek előállításban. *Gazdálkodás*, 53 (4) 346-356. p. ISSN 0046-5518
3. **Dudás Gy. (2009):** A TÉSZ-en keresztüli értékesítést motiváló tényezők és körülmények. *Gazdálkodás*, 53 (5) Under publication.

Conference presentations (foreign language)

1. **Dudás, Gy. (2002):** The role and task of Producer Organizations in the fruit and vegetable sector. 2nd International Conference for Young Researchers of Economics. Gödöllő, 17-18 October 2002. Volume 1. 82-86. p. ISBN 963 9483 05 2ö ISBN 963 9483 06 0
2. **Dudás, Gy. (2008):** The possibilities of the Producer Organizations in Hungary. 5th International Conference for Young Researchers of Economics. Gödöllő, 13-15 October 2008. CD kiadvány 85-91. p. ISBN: 978-963-269-071-1
3. **Dudás, Gy. - Fertő, I. (2009):** The impact of trust on cooperative membership performance and satisfaction in the Hungarian horticulture. 3rd Green Week Scientific Conference. "Multi-level Processes of Integration and Disintegration" Berlin, 14-15 January 2009. Book of Abstracts 56. p.
4. **Takács-György, K. - Dudás, Gy. (2009):** Horizontal integration – New challenges and opportunities for farmers in horticulture sector. 1st International

Scientific Conference in the Modern Public Affairs Management Series Revitalization Processes and Local and Regional Development, Jagellonian University, Krakow, 18-19 November 2009. (11 p.) Under publication.

Conference presentations (Hungarian language)

1. **Dudás Gy. (2001):** A Termelői Értékesítő Szervezetek szerepe és feladata a kertészeti termelés koordinálásában. Erdei Ferenc Emlékülés Tudományos Konferencia, Kecskemét 2001. augusztus 30. Konferencia kiadvány 231-237. p.
2. **Dudás Gy. (2002):** Az Integrátorok és a Termelői Értékesítő Szervezetek szerepe a kertészeti termelés koordinálásában. VIII. Nemzetközi Agrárökonómiai Tudományos Napok, Gyöngyös 2002. március 26-27. Konferencia kiadvány 232-237. p. ISBN 963 9256 75 7 Ö ISBN 963 9256 89 7
3. **Dudás Gy. (2003):** A piacépítés lehetőségei és eszközei a Termelői Értékesítő Szervezetek számára. Erdei Ferenc II. Tudományos Konferencia, Kecskemét 2003. augusztus 28-29. Konferencia kiadvány I. kötet 229-233. p. ISBN 963 7294 46 Ö, ISBN 963 7294 48 1
4. **Dudás Gy. (2003):** A Termelői Értékesítő Szervezetek lehetőségei az Európai Unióban. XLV. Georgikon Napok, Keszthely 2003. szeptember 25-26. Konferencia kiadvány 69 p. ISBN 963 9096 81 4; CD kiadvány:\GN2003\Konferencia\Előadások\EU\Dudás. ISBN 963 9495 26 3 (6 p.)
5. **Dudás Gy. (2003):** A ZÖLD-TERMÉK Szövetkezet 2003. évi gazdálkodásának az elemzése. IX. Nemzetközi Agrárökonómiai Tudományos Napok, Gyöngyös 2004. március 25-26. Előadások összefoglalói 67 p. CD kiadvány:\2. Üzemtan és üzemgazdaság\6\Dudás, Gyula. ISBN 963 214 313 2 (5 p.)
6. **Dudás Gy. (2006):** A másodlagos TÉSZ együttműködések és a ZÖLD-TERMÉK Termelői Értékesítő Szövetkezet gazdálkodásának az elemzése. X. Nemzetközi Agrárökonómiai Tudományos Napok, Gyöngyös 2006. március 30-31. Előadások összefoglalói 218 p. CD kiadvány:\Poszter\krf52.doc. ISBN 963 229 623 0 (7 p.)
7. **Takácsné György, K. - Dudás Gy. (2009):** A termékpálya menedzsment szerepe a zöldség-gyümölcs ágazatban a változó környezetben. Erdei Ferenc V. Tudományos Konferencia, Kecskemét 2009. szeptember 3-4. (7 p.) Under publication.

Other publications

1. **Dudás Gy. (2003):** Termelői összefogás Üllésen és vonzáskörzetében. *Kertészet és szőlészet*, 2003. 52 (28) 9-10. p.
2. **Dudás Gy. - Császár Sz. (2005):** 2005 a másodlagos TÉSZ-alapítások éve. *Kertészet és szőlészet*, 2005. 54 (15) 8-9. p.