

**TRANSACTION COSTS
WITHIN THE INDIVIDUAL AND COOPERATIVE APPLE
PRODUCERS IN PRESPA REGION, THE REPUBLIC OF MACEDONIA**

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Apple production in the Republic of Macedonia is an important sector that highly contributes to the economy in terms of employment and income, especially for the small farmers in Prespa Region. Despite cooperatives' efforts and governmental support to attract members through the provision of inputs, technical advices and other incentives to farmers, membership adherence is low and slow. The Transaction Cost Economics Theory (TCE) provided the basis for this study where the choice is conditioned by relative comparative advantage in terms of lower transaction costs.

Based on the research, following conclusions are underlined: a. from the perspective of farmers and the cooperatives there are factors that positively influence the choice of cooperative membership; b. from the cooperative's side, some of the positive influences are its regular flow of price information, constant technical advices and secured market; c) for farmers who aim at increasing production and improving their incomes, membership to cooperative signifies security of accessing cheaper inputs especially chemical fertiliser, security of market for the produced apples and higher frequency of transaction cost. Farmers' choices are not exclusive to one type of structure or the other. Farmers can transact with the cooperative and trader at the same time, influenced by the differences in the price among the "Idared" and "varieties". Both of them, members and non-members are limited connected to the "middlemen" in choice of transactions.

Keywords: *transaction cost economic theory, apples, cooperative, farmers, Republic of Macedonia.*

Producerea merelor în Republica Macedonia este un sector important care contribuie esențial la economie din perspectiva angajării în câmpul muncii și a asigurării veniturilor, în special pentru fermierii mici din Regiunea Prespa. În pofida eforturilor cooperativelor și suportului oferit de guvern pentru atragerea membrilor de cooperativă prin acordarea de resurse, asistență tehnică și alte facilități pentru fermieri, aderarea la cooperative este scăzută și se realizează lent. Teoria economică a costurilor de tranzacționare (TCE) a furnizat baza pentru acest studiu, în care alegerea este condiționată de un avantaj comparativ relativ în ceea ce privește costurile de tranzacționare mai mici.

În baza cercetării realizate au fost identificate următoarele aspecte: a) din perspectiva agricultorilor și a cooperativelor există factori care influențează pozitiv alegerea calității de membru de cooperative; b) din punctul de vedere al cooperativelor, unele dintre influențele pozitive sunt reprezentate de fluxul regulat de informații despre prețuri, asistență tehnică constantă și piața de desfacere sigură; c) pentru fermierii care urmăresc creșterea producției și îmbunătățirea veniturilor, calitatea de membru al cooperativei acordă siguranță la accesarea resurselor mai ieftine, în special îngrășămintele chimice, siguranța pieței de desfacere pentru merele produse și frecvența mai mare a costurilor de tranzacționare. Alegerile agricultorilor nu sunt exclusiv pentru un tip de structură sau pentru celălalt. Fermierii pot tranzacționa împreună cu cooperativele și comercianții, influențați de diferențele de preț dintre „Idared” și „alte soiuri”. Atât membrii de cooperativă, cât și cei care nu sunt membri de cooperativă sunt limitat conectați cu „intermediarii” în alegerea tranzacțiilor.

Cuvinte-cheie: *teoria economică a costului de tranzacționare, mere, cooperative, fermieri, Republica Macedonia.*

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Производство яблок в Республике Македония является важным сектором, который вносит большой вклад в экономику с точки зрения занятости и доходов, особенно для малых фермеров в Регионе Преспа. Несмотря на усилия кооперативов и правительственную поддержку для привлечения членов кооперативов путем предоставления ресурсов, технического консультирования и других стимулов для фермеров, вступление в кооперативное членство является низким и медленным. Экономическая теория транзакционных расходов (ТСЕ) послужила основой для этого исследования, согласно которой выбор обусловлен относительным сравнительным преимуществом более низких транзакционных издержек.

С точки зрения фермеров и кооперативов есть факторы, которые положительно влияют на выбор кооперативного членства. Со стороны кооператива некоторые из положительных влияний – это регулярный поток информации о ценах, постоянные технические консультации и обеспеченный рынок сбыта. Для фермеров, которые стремятся увеличить производство и улучшить свои доходы, членство в кооперативе означает гарантию доступа к более дешевым ресурсам, особенно химическим удобрениям, безопасность рынка сбыта для производимых яблок и более высокую частоту транзакционных издержек. Выбор фермеров не относится исключительно к одному типу структуры или другому. Фермеры могут одновременно взаимодействовать с кооперативом и торговцем, под влиянием различий в цене между «Айдаред» и «других сортов». Как члены кооператива, так и те, которые не являются ими, имеют ограниченный доступ к «посредникам» в выборе транзакций.

***Ключевые слова:** экономическая теория транзакционных расходов, яблоки, кооперативы, фермеры, Республика Македония.*

JEL Classification: A13, L14, L22, P13, Q13, D23.
UDC 631.162:657.471.65+631.11.8](497.17)

Introduction

Nowadays, the Government of Macedonia (GoM) encourages farmers to join cooperatives, increase their competitive, and export power. However, still their products are mostly sold at local green markets or exported through local „middlemen”. Currently, in Macedonia there are only 20 cooperatives and 80 associations. Only dozen are working properly but far away from the level of similar organizations in EU Member States. In case of apple production, cooperatives are still not defined models of organization. Because of this, farmers cannot recognize their benefits yet. For instance, in the Region of Prespa, which is cradle of apple production, nowadays, there is only one cooperative “Res-group” facing many difficulties, driven by internal and external factors.

The emergence of cooperatives was associated with many expectations with regard to improve the sector performance. However, these expectations have not been fulfilled due to inability to attract members or solve market chain problems. Becoming a member of the cooperative or not is a decision that affects the choice whether apples should be sold through the cooperative or directly to traders. In addition, it also affects the choice of input channel, whether it should be through cooperative or third party. Although cooperative would greatly reduce the burden of farmers in post-harvest processing, not all the farmers are willing to transact with them. And/or no one provide unique products which can be sold in overall through the cooperative.

Over the last decade, influenced by globalization processes in food production, trade and consumption have changed and improved the role in vertical coordination of agri-food value chains. Nowadays, coordination is driven by gathering and processing information, making decisions and communicating these decisions. Thus, this vertical coordination in the value chain requires flowing of the information exchange in both ways, upstream and downstream among the participants of the chain. In generally, cost of information exchange and decision-making are coordination costs, which together with transactional risks make up transaction costs [2]. Transaction cost theory is basis of the agricultural cooperatives in vertical coordination in agri-food value chains.

The hypothesis of TCE according to [6] is that economic organizations are an efforts to „align transactions, which differ in their attributes, with governance structures, which differ in their costs and competencies, in a discriminating (mainly, transaction cost economizing) way”. Five attributes of transactions have been distinguished that affect the size of transaction costs [4]: asset specificity, environmental uncertainty and complexity, frequency, behavioral uncertainty, and connectedness to other transactions. Concerning the environmental characteristics on which this thesis focuses on, [5] distinguished

three aspects of a transaction that influence the size and nature of transaction costs. These are asset specificity, uncertainty and frequency (connectedness). These costs differ depending on the transaction partner. Therefore, a decision on the transaction structure also affects the variety of apple produced. Traders dealing with farmers are more than spot-market-buying and buying-selling-arrangements, they are also playing a key role in inputs providing and money lending as well. There are several traders in Prespa Region, which make market distortion and dictate purchasing price.

Cooperative „Res-group” provides more stable marketing channel and secure access to inputs and frequently flow of price's information. Lack of storage capacity and processing technology make them powerless in bargaining and market orienting. Therefore, the ultimate choice is weighed against these relationships or 'commitment factors' associated with any membership status. Question remains how farmers differently evaluate these different choices. In this study case, transaction costs of the apple production are with lower frequency, hierarchically limited market and uncertainty. Therefore, it would be crucial to understand its chain supply and the whole process in general.

Material and methods

For this paper researchers have used several techniques to get the required data such as literature research, discussion with key informants, deep interview survey and observation of the participants as well as administrative authority specialized in this sector.

Discussions with key informants were useful to collect as much as possible information about the research area, apple sector and the cooperatives as well. Informants were the staff from the regional office of the National Extension Agency (APRZ), specialized in field of apple production, Associated Professors dealing with Development and Organizational Management studies from Faculty of Agriculture Science and Food-Skopje, regional apple producers, the manager of cooperative ZZ „Res-group”, Local Authority bodies, traders, retailers, and fruit exporters. In Prespa Region, 60 farmers were interviewed with a formal questionnaire structured on close-ended and open-closed questions.

Selection of the cooperative and individual farmers was performed in a multi-stage sampling process. First stage was an in-depth study with purposely-selected cooperative ZZ „Res-Group”. The cooperative is centralized and independent, member of the Macedonian Cooperatives Alliance, which play role of cooperative's umbrella in the Republic of Macedonia. Second stage covers selection of 20 farmers with more than 3 hectares under apple production and 20 farmers with less than 3 hectares (both group are non-members). On the other hand, researchers select 20 farmers who are members of the cooperative „Res-group”.

Cross-tabulation analysis are used to compare categorical variables or group of them, and strengthens and existing of the relationship between them. Moreover, it can be used to test hypotheses using one of the non-parametric techniques called „Chi-square test”. This test is used to compare the proportion of cases from a sample with hypothesized values or those obtained previously from a comparison population.

- Compared variables are categorical (nominal or ordinal);
- Adequate sample size is large ($N \geq 60$); and
- Adequate cell frequency is less than 5.

In this paper, researchers explain their explored data within the relationship between two or more categorical variables based on a cross-tabulation table, with cases classified according to the categories in each variable. In correlation with the above pattern of research approach, we formulated the following hypotheses:

- 1) Transaction costs and retail partnership differ according to the membership status;
- 2) Beside transaction costs, the choice of transaction partner depends on the membership status towards the cooperative; and
- 3) Transaction costs are lower within the cooperative than individuals.

Results and main findings

Varieties of apple. Prespa Region is a recognized apple producer on the European and Middle East market. Prespa is characteristic for several types of apple varieties, but most recognized are Idared, Gold and Red Delicious, Chadel and Mutsu. Commonly for farmers is to divide apple varieties on “Idared” (as a main dominant variety on the farms, less price and easily maintenance) and rest of them so called “varieties” (Red and Gold Delicious, Mutsu, Chadel and Granny Smith) which are produced on a smaller rank (than Idared), with bigger purchasing price but less favorable for maintenance of production process.

As can be seen (Figure 1) bellow, most of nonmembers are producing varieties with expensive

maintenance costs and takeover a higher risk than members. On the other hand, members tend to produce more productive varieties as well as nonmembers, but their financial power, lack of processing technology and more effective maintenance equipment make them limited and base on less costs varieties growing, thus, reducing the potential losses. Main differences within membership status exist in the varieties of “Red Delicious” and “Granny Smith”. Their seedling was sensation during the 90’s when farmers look at them as alternative of “Idared”, thus low cost of maintenance and high income.

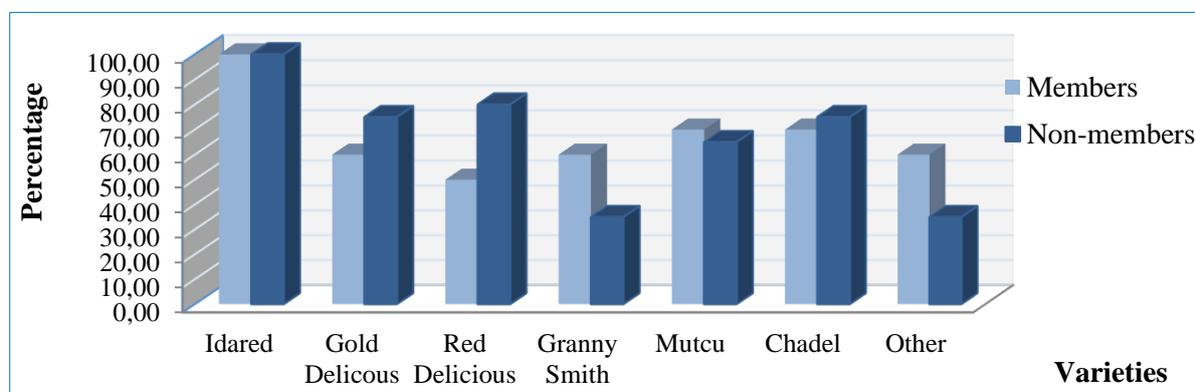


Figure 1. Produced varieties of apple within membership status (2013)

Source: Authors' based on primary data, 2014.

In general, farmers are using to sell their apples classed as an „Extra class” for consumption and „First class” or so-called „Industrial apple” for processing factories producing: juice, powder, jam or cakes. No one of the farmers hold calibrating system or cooler storage nor processing capacity for adding value on their products. Traders and wholesale retailers own mainly those technologies.

Apples sale. Common biggest problem for apple producers is market oriented synergy, as well as quantity and quality offer facing market's demand. Price per kilogram fluctuates during the whole season. From the beginning of harvesting season, when speculations are driven by traders as called „middleman” and external wholesale buyers from consuming demand countries, till the end in the spring when the apple reduce its weight and quality influenced by lack of modern storage capacity. In the table below is shown amount and income from the sold varieties of apple within membership categories.

Table 1

Yield and income from both varieties within membership status (2013)

	N	Member	St. dev.	Non-Member	St. dev.
Quantity of „Idared” (Kg)	0	64,100	33,368.15	73,400	35,771.73
Income from „Idared” (MKD)	0	684,400	422,895.68	765,750	443,816.80
Quantity of „varieties” (Kg)	0	16,900	9,677.59	16,950	11,138.95
Income from „varieties” (MKD)	0	289,000	182,642.33	264,175	172,858.57

Source: Author's based on primary data, 2014.

From the results above, quantity of sold „Idared” is higher among nonmembers influenced by the yield. Price is non-factor that influence the income, as we can see that income is similar comparing with the amount. Differences are occurs only in the produced amount among farmers driven by their land size. In the case of the varieties members have higher income than non-members, with main reason that price of selling through the cooperative is higher even the total of produced amount is almost equal with non-members. However, differences occur only in income.

A sale of apples is doing few months per year with possibility to increase that period through investment in cooler-storage capacities. Amount of produced apple mainly depend on weather conditions and fertiliser's quality. Price is influenced by local wholesale exporters or so-called “middle-man”, and mainly by the regional market price and production season among EU.

Cooperative members are trying to get quality and quantity as well and carefully chose their transaction partner with placed emphasis on payment date. Characteristic for non-members are that they

tend to quantity with less investment and zero days delay in payment. Nevertheless, common for both categories is that they are not powerful in bargaining price at all. Traders are collecting their fruits from each farmer's storage place in most cases in their households.

In average both membership categories earn less or more the same amount for „Idared”, but not in the cases of the varieties where member's income is higher than non-member for the same amount of products, because varieties were sold through the cooperative.

Breakeven price. Taking into account all costs involved such as described above, farmers felt that minimum price were lower than costs occurred in the apple production. Therefore, they suggested breakeven price that can proxy all costs per kilogram of apple independently of „varieties” or „Idared”. For the apples, such a breakeven price would include costs on trees maintenance, fertiliser and added labour in harvesting process. For both, “Idared” and rest of the varieties in this research the breakeven price found to be 17 MKD on average in general. Members were asked for price of 18 MKD per kilogram or lower than nonmembers, where they are asking for 16 MKD. Reason for this differences in the price within membership categories is influenced by input's price and maintenance costs within membership status.

TCE perspective within membership status. A comparison of „Res-group” cooperative and traders provides more explanation on their relationship within apple producers. Following the Transaction Cost Economics Theory, the cooperative can be described as hybrid, while traders as spot market key players. Choice of farmers to transact with any structure depends on their comparative advantages analysed through transaction costs. Farmers and traders present themselves as totally different governance structures in which “Res-group” choose to operate as an entity, similar to the structure of trader's companies. Main principle in choosing “most favorable” transaction structure is that, transaction cost should be lower thereby offering a comparative advantage. This analysis is therefore an attempt to compare and distinct the main elements of these cost, consequently bringing out differences that could help in explaining farmers' choices.

Asset specificity are durable investments that are undertaken in support like a part of transaction or opportunity cost, which investment is much lower in best alternative uses. It refers to the degree of which the asset has little or no value outside that relationship. In context of the apple production, elements of asset specificity are especially physical assets, dedicated assets and less or more brand assets.

Elements of physical asset specificity observed in this paper are size and number of plots under apple production and perishability of them after harvesting. Degree of specificity is different according to transaction structures. High asset specificity is assumed associated with the cooperative, as access to membership that involves in principle the ownership of minimal number of apple trees. Limited land utilization, valuable and price of the land, patriarchal family partition and unsolved property rights are factors that influence both groups according to the number of plots. The Pearson Chi-square shown weak Sig. level= 0.592*¹ (See Appendix A) because all factor mentioned above are common matters within membership status.

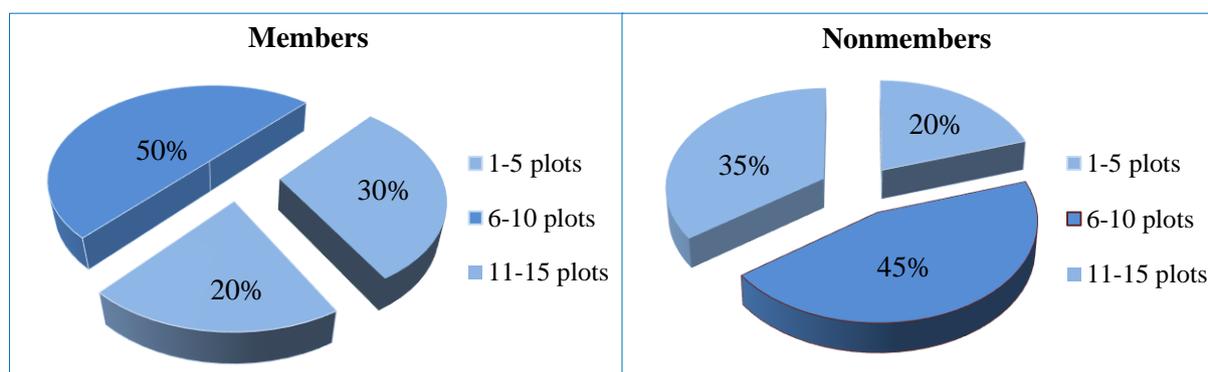


Figure 2. Number of plots within membership status

Source: Authors' based on primary data, 2014.

* Relationship is significant at the 0.05 level (2-tailed)

The way and quality of fertilising play a key role in shelf-time of their products. This situation increases the asset specificity that is associated within transaction cost. There are big differences in using fertilisers between membership categories according to Pearson Chi-Square, where a Sig. level= 0.199* (See Appendix B.) researchers were found¹. In general, perishability affects members and nonmembers as a week point of their limited possibilities in qualitative products and used growing technologies.

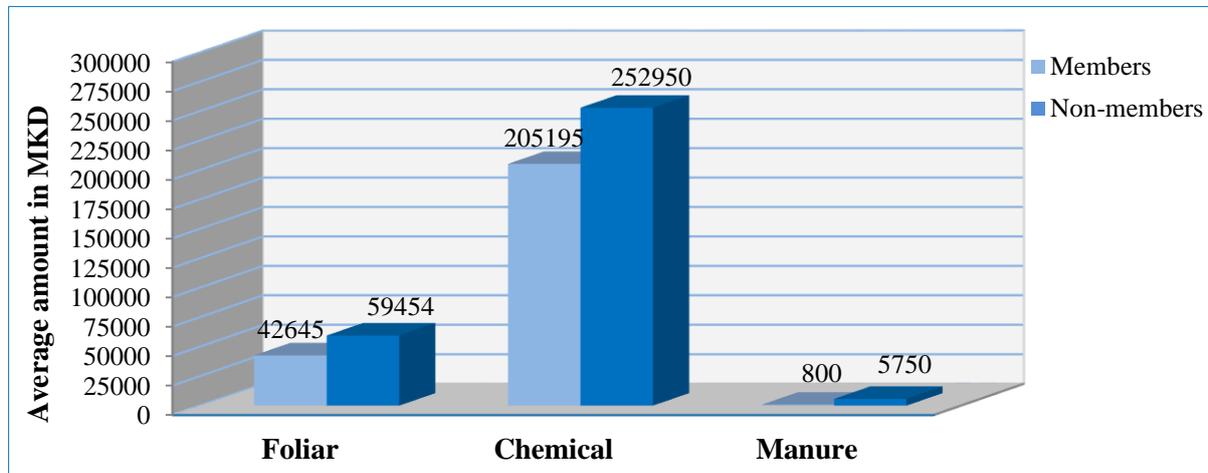


Figure 3. Amount of MKD used for fertilisers within membership status (2013)

Source: Author`s based on primary data, 2014.

Main difficult for cooperative is to regulate and uniqueness the using and quality of fertilisers. Monopoly of fertilizing`s market determined by local agricultural pharmacies lead to high price of fertilisers. Even fertilisers are accessible their quality is suspicious. Low educational level, monopoly on fertiliser`s market and undefined governmental regulation for pest management lead to using of low quality and inefficient fertilisers for unreasonable price. Hence, influencing high transaction costs and fluctuates on farmer`s income and yield.

As they are selling as a unique entity, their products should follow the same quality, where among the members this case is matter of problem. On the other hand, if apples are stored and fertilized by using high technology and uniqueness, than the risk of perishability is lower and farmers can take their time to manipulate on the market, especially with traders. In case of Prespa`s apple farmers are lack of brand name as it was in the past when “Prespa`s Idared” was market recognized and in demand. Farmers` tendencies led to investing in new varieties and more commercial than convention production.

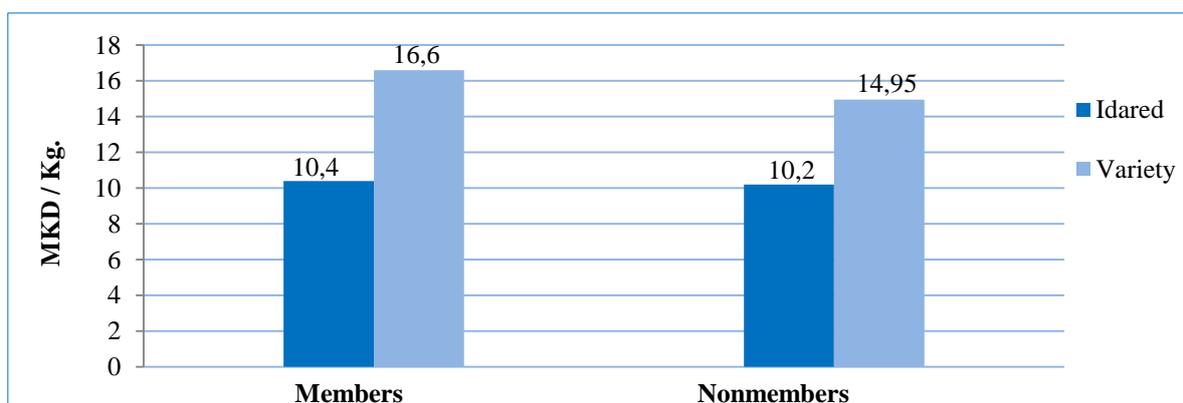


Figure 4. Average price per type of apple within membership status (2013)

Source: Author`s based on primary data, 2014.

* Relationship is significant at the 0.05 level (2-tailed)

Uncertainty. Forms of uncertainty do not be left as a mentioned and described here are price variations while selling their products and delays in payment. Apple transactions are faced with high uncertainty due to price fluctuations. Even the price is fixed by larger traders for „Idared” and „varieties”, from farmers’ perspective there is still uncertainty regarding the amount of money that they will ultimately receive after selling. The level of uncertainty is lower for „varieties” since cooperative found export market to other countries. However, with the „Idared”, traders have habit of changing prices for no particular reason, just by speculating on farmers’ ignorance: farmers are told that their apples are with bad quality, market segmentation, lower demand on regional markets, etc.

Occasionally, there are small variations around the price of „Idared” for non-members and less or more variation for members mainly reason is the achieved contractual export agreement, which also influence stable price for „varieties” as well. However, for the „varieties”, large variations are observed for nonmembers, because of the high demand and frequently market speculations made by globe market and high uncertainty associated with traders.

Farmers sell their products with the expectations of satisfying the many household consumption requirements and making savings for the future contingencies that may include investments in new varieties or mixed fruit plots.

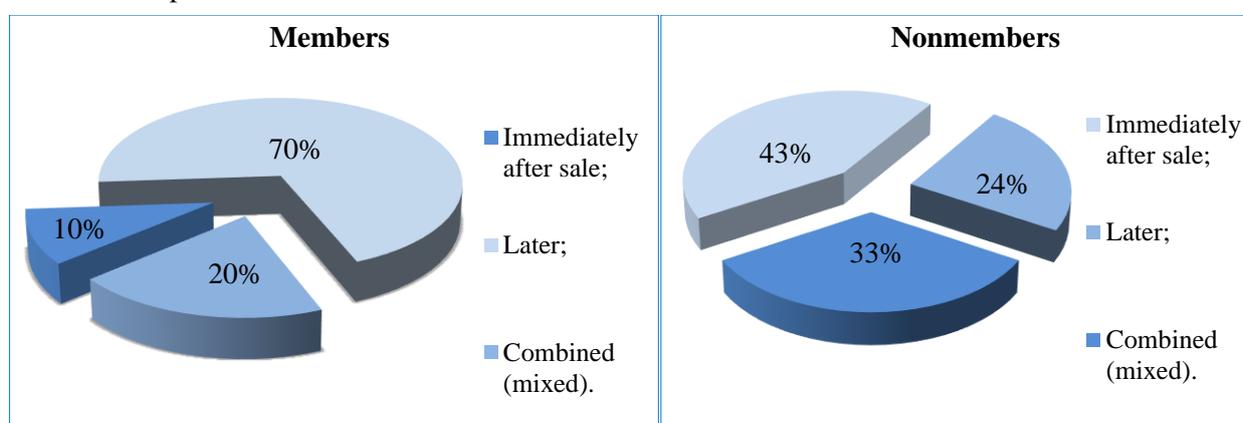


Figure 5. Delay in payment within membership status (2013)

Source: Author`s based on primary data, 2014.

The payment options offered to farmers depend on their transaction partner. As researchers finding of Pearson Chi-Square, shown Sig. level= 0.053*¹ (See Appendix C) between both groups is very weak. With traders, payment is straightforward made immediately after sale and high cash fluctuation occur. They are trying to avoid taxation and prefer cash transactions. There are also cases when traders give you no other choice then to delay your payment, usually within few weeks. There is no exception when delay is over few months as well, thus farmers face problems two-sided problems. First, they cannot approve their transaction, because it was cash money without bill. Second, they become in unfavorable position in front of the Law and Court, in case when they are sue the other party. However, with „Res-group” payments are not made immediately after the transaction, mainly due buyers sell their products on third party. Quantity of apples supplied and payments are indicated on paper and transaction is going through the bank. Cases where cash money is paid immediately are not exception as well, mostly in case of First Class transaction made.

Farmers usually receive information for price, policy and other information related to their daily activities from their friends, mass and social media. Usually worldwide price is not same as the price in Prespa Region. Traders are those who have information for demand and supply chain in apple consumption sector. Farmers are based on their information and their price. Prespa Region suffers of such kind of consortiums, organisations and marketing companies. Cooperative`s members are more informed about demand and price. Information flow is more frequently among the membership, and have more reliability and validity on the database connected with apple production.

* Relationship is significant at the 0.05 level (2-tailed)

Frequency. Indicates the intensity which transactions are handled. With low frequency, costs per transaction are relatively high. With an increase in number of transactions, costs per transaction will decline. Frequency of transactions in the apple sector is related to seasonal characteristics of production. These transactions are recurring every year, followed by high intensity of frequency within each structure of transaction. The level of intensity is different between traders and farmers. Within the cooperative, transactions are not only based on buying-and-selling. Hence, all this indicates that there are many occasions of interface between the cooperative and farmers. Majority of members said that semi-secured market, less input price and stable purchasing price are reasons why they made transactions through the cooperative. On the other hand, non-members do not have choices as the cooperative, all of their transaction opportunities are based on traders' willingness, or a small-scale local retail market.

To assess the fully intensity of frequency, there is need for an assessment of what a particular intervention either by the members/non-members/traders means to a particular farmer in a particular period of the season, how fast is the intervention made and how effective it responds to the need. Characteristics of the transactions associated with members, non-members or traders are summarized in Table 2. Their relative degrees are presented as high (++) or low (+) depending on description made above.

Table 2

Summary of transaction cost characteristics

		Cooperative Members	Non-members	Traders
Assets specificity	Apple growing plots	++	++	+
	Perishability	+	+	++
	Limited fertilising quality	+	+	+
	Well-known brand name	+	+	++
Uncertainty	Price variation	++	++	+
	Delay in payment	+	++	+
	Information flow	++	+	++
Frequency	Transactions	++	++	+

Source: Author`s based on primary data, 2014.

Conclusion

Classical TCE solution for reducing transaction costs usually is to choose a governance structure that is more hierarchical in principle, thus, shifting from market to contracting, or from contracting to foci on vertical integration, according to [1]. Tendencies of „Res-group” to be more market oriented easily can increase their transaction costs in case of assets specificity. Their hybrid position transforming in hierarchical mechanism can reduce this costs through strong vertical coordination and contract farming. However, asset specificity is higher for all farmers, but not for the traders. Exception of their market mechanism characteristics through hybrid tools can slightly reduce asset specificity, both farmers and cooperative.

Uncertainty in the apple sector of Prespa Region occurs usually in correlation with the complexity. In general, the value supply chain is one complex system in which many external factors lead to uncertainty among the farmers and the cooperative as well. The burden of the cooperative is lower in case of this study, mainly because of lower price variation and fixed delay in the payment. On the other hand, the rest of the farmers are influenced by unsecured breakeven price, unlimited delay and in addition, weather conditions, than uncertainty have gotten into climax. Therefore, the more complex the transaction is, the harder it will be to anticipate and describe fully and accurately the responsibilities of each party in the contract [3] in the literature review above. Reducing uncertainty can be provided through unified products, set quality and size standards among the membership, and organising in vertical coordination. Matters of problems that occur are organic products, „middlemen”, setting-up standards and declarations. Do not be left as mentioned that will occur, as a problem in near future is the protected designation of origin as a protected apple varieties in the case of Prespa Region and protected geographical indication in general as well.

An apple production has seasonal character and reflects low frequency in transaction costs. Because of the market hierarchy and hybrid mechanism of the cooperative, members enjoy higher frequency rather than rest of the farmers. The most important thing that should not be overlooked is that, the manager of the cooperative has incentives to minimize transaction costs, thus, in a way to develop contractual relationships with traders and exclude „middlemen” from the supply chain. Nonmembers are facing low frequency and high costs influenced by traders. The market limited opportunity and choice of transaction partner makes them loss of the synergy and frequency as well.

From all discussed above „Res-group” lead complex mechanism strategy, influenced by high uncertainty in price variation and delay in payment. High asset specificity and low frequency, force the management to adopt model of organization that minimizes the transaction costs and on the other hand to make a stabile position in the apple supply chain. In case of non-members they are facing lower frequency and higher uncertainty than members. On the other hand, they face lower asset specificity and maladaptation of synergy losses. Moreover, non-members are facing stronger market hierarchy and conditions, thus their bargaining power is in an unfavorable position than the cooperative one.

Appendices

Appendix A: Relationship between numbers of plots within membership status

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.275 ^a	12	.592
Likelihood Ratio	12.732	12	.389
Linear-by-Linear Association	.273	1	.601
N of Valid Cases	60		

Source: Author`s calculation based on primary data, 2014.

Appendix B: Relationship between types of used fertilisers within membership status

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.650 ^a	3	.199
Likelihood Ratio	5.864	3	.118
Linear-by-Linear Association	.967	1	.326
N of Valid Cases	60		

Source: Author`s calculation based on primary data, 2014.

Appendix C: Relationship between delays in payment within membership status

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.875 ^a	2	.053
Likelihood Ratio	6.077	2	.048
Linear-by-Linear Association	.242	1	.623
N of Valid Cases	60		

Source: Author`s calculation based on primary data, 2014.

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