Food marketing cooperatives of Crete: A financial assessment within the EU context

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In this paper an estimate is made concerning the correlation between the prosperity and viability of food enterprises and the volume of fixed assets. The amount of investment in fixed assets refers to the volume of the food cooperative activities. Hence, it can be considered as a comprehensive indicator which shows the size and use orientation of enterprises. The financial activity results and efficiency of the cooperatives depend, in many respects, on investments in the floating funds and fixed assets, the size of investment in monetary units and materials and the optimum ratio between them. This paper provides a financial assessment and comparative analysis of the food marketing cooperatives, against the amount of the fixed assets they have.

The main purpose of this research is to estimate the viability of food marketing cooperatives under competitive conditions in the agricultural sector and to evaluate the financial aspects of their activities in terms of the size of fixed assets. The research provides a brief overview of the European Union experience from the financial side of cooperative activities. But due to the huge size of the EU and the significant differences between the various countries, it is difficult to estimate the issue on a union scale. Instead, some general features are mentioned briefly with reference to Greek cooperation, with more specific and detailed data and analyses provided for several cooperatives located in Crete.

Crete was chosen for this research because it is one of the largest food producing regions in Greece. The comparative analysis was carried out based on the data for four consecutive years (from 2003 to 2006). For the purpose of this study, cooperatives functioning in Crete were chosen. The aim of the current research was to determine the interdependence between the size of the fixed assets and the welfare of the cooperatives and to underline the optimum amount of assets for marketing cooperatives, based on the ranking of the enterprises.

Keywords: food marketing cooperatives, fixed assets, financial ratio analysis, multicriteria analysis.

1. Introduction

A company's size is an important economic indicator for all sectors of the economy. Based on aspects of economic theory, the dependence between the size of a company and the efficiency of its activities can be randomly deemed as either negative or positive. The bigger the size of an organization, the smaller the ability for rapid changes within the enterprise. The small and medium enterprises are more flexible. Moreover, due to their usual multi-activity specialization, they can easily adapt to the market changes. On the other hand, big companies can hold a significant market power, have good recourse potential, use an economy of scale, and so forth. Hence, the size of an organization is important because large and small companies react differently to market changes. In general, both large and small companies have their own advantages and disadvantages in terms of efficiency.

Therefore, we can conclude that there is an absence of the essential correlation between the efficiency of the enterprise and the size of its assets. On the other hand, it can at the same time be mentioned that small enterprises can modify their business activity faster than large ones under constantly changing market conditions. For the large companies, despite their economic stability, their size can provoke sluggishness for their further development. This research was carried out in order to verify whether these two factors are correlated and to define whether the correlation if it exists, is negative or positive in each case. Apart from another interest, the purpose of this study was to rank the food marketing cooperatives according to their financial performance in the agro-food market and to analyze the possible reasons which can explain the existing ranking. Moreover, the aim was to locate the existing problems of agricultural enterprises, functioning under similar economic and social conditions. The idea was to confirm the weaknesses and strengths within the chosen group and to discover possible solutions to overcome the troubles that exist in the cooperatives' economic activity. All the above was used as the main prerequisites for the analysis.

Nowadays, many economists and financial analysts have long been preoccupied by the performance evaluation of food enterprises (Getzlogiannis, 1997). Researchers have paid much attention to different kinds of food cooperatives and a tremendous number of agricultural enterprises were examined from a variety of different facets. According to Van Dijk (1997), almost every country in the world possesses cooperative organizations. In his work, he shed light on the membership problems within the cooperatives, boards, and management, as farmers attempt to move closer to consumers through value-added processing.

Several studies have been conducted to analyze the efficiency of Cretan food cooperatives concerning their ranking and estimation in terms of financial management. Zopounidis, et al. (2006) discovered the weakest points of financial management within Cretan cooperative organizations and possible ways to overcome the existing problems. The classification of 12 out of the 16 unions of Crete was made for the year 2002. The research indicated that high loan burdening, low liquidity, and ineffective operations are some of their problems.

Baourakis, et al. (2002) presents an estimation and assessment of Cretan cooperatives, by using the PROMETHEE II methodology. The analysis was based on a comparison of cooperative enterprises and juice producing companies

Several other researchers have been working on the evaluation of the financial performance of agri-food enterprises, using the same multicriteria methodology (PROMETHEE). Kalogeras, et al. (2004) presented the case studies used for conducting empirical research, based on the analysis of agro-food companies established and operating in Greece (producing homogeneous food-products and fruit-juices) and the Cretan food cooperatives. The results of the financial and multicriteria analysis were used to estimate the parameters which would determine the financial weaknesses and threats of the companies under research.

The current research is being undertaken to examine the correlation between the size and the economic status of food marketing cooperatives in Crete. The data for this research were obtained from the annual financial statements of the food cooperatives operating in Crete. The comparative analysis was carried out based on the data of four consecutive years (from 2003 to 2006). For the purpose of this study, a total sample of fifteen food marketing cooperative enterprises operating in Crete was selected.

This study is organized as follows: after the introductory part, a brief overview of the current economic situation in the EU countries and general performance of the European cooperatives will be presented in Section 2. For further research, Section 3 will focus on a short observation of the Greek economy and a brief overview of the food cooperatives functioning on the Greek agri-food market. This will be followed by a detailed assessment of the Cretan food cooperatives and methodological framework which will be thoroughly presented in Section 4. The subsequent section will present the methodology and results of this research, from which relevant conclusions will be drawn. Finally, an attempt will be made to shed light on the correlation between the size of the cooperatives and their efficiency. The results of this study will indicate whether firm size has a positive effect on the company's business activity and its rank position. Moreover, the current existing problems in the food cooperatives will be discussed with possible solutions and suggestions proposed for future empirical research.

2. *Basic comprehension and position of cooperatives in the EU*

During the last ten years the role of food cooperatives has changed significantly in developed countries. The main tendency was to maintain cooperatives and to develop them in the food sector of the economy, because they are the sole form of business able to survive. This process was also represented in the European Union countries. In the agricultural sector of every European country, a substantial amount of goods is produced by the cooperatives. A cooperative is an organization that is owned and run by the same group of people that also does business with the organization and derives benefits from this business; cooperatives are more than a century old (Van Bekkum, et al., 1997).

Cooperation in the food sector has been essential for the EU countries since olden times. The farmer's aspiration to decrease production costs, technology use and improvement, and a guarantee of the market share for themselves was the stimulating factor for the cooperatives' development. The experience of the producing and marketing cooperatives in the EU shows that these enterprises assemble all the companies operating in the agricultural market and play a significant role in sales of food production, raw materials and technical maintenance of farms.

The efficiency of the cooperatives all over the world is guided by the principles presented by ICA (ICA, 1995):

- *Voluntary and open membership*. Cooperatives are voluntary organizations, which are open to everybody who needs to use their services and are willing to accept responsibilities of membership, without any kind of discrimination.

- *Democratic member control*. Cooperatives are democratic organizations controlled by their members, who actively participate in setting their policies and making decisions. Therefore, cooperative members have equal voting rights (one member - one vote).

- *Member economic participation*. Members contribute equitably and democratically to control the capital (or, at least, a part of it) of their cooperative. For the purpose of investment, money members usually receive limited compensation. Members allocate surpluses for any of the following purposes: developing their co-operative, possibly by setting up reserves (part of which at least would be indivisible), benefiting members in proportion to their transactions with the co-operative; and supporting other activities approved by the membership.

- *Autonomy and independence*. Cooperatives are autonomous, patronized and controlled by their members, but they can cooperate with other companies or the government.
- *Education, training and information*. Cooperatives provide education and training for their members, based on the idea of potential member contributions to the development of the cooperatives.
- *Cooperation among cooperatives*. Cooperatives help the cooperative movement by working together through local, national, regional and international structures.
- *Concern for the community*. Cooperatives work for the sustainable development of their communities through policies approved by their members.

Based on the principles above, cooperatives satisfy not only their members' needs, but also the needs of the population. Hence, cooperative organizations exist in every country, no matter how developed the country's economy is.

Within the EU, food and marketing cooperatives are consolidated into large-scale unions by territory and specialization at the regional or national level. National cooperative unions represent farmers in meetings with the government of their countries and they actively participate in agricultural policy elaboration. Moreover, in some countries they represent the national cooperation in other cooperative international organizations. They are also involved in senior EU organization (Osipov, et al., 2006). The legal framework of cooperation is currently represented by the special cooperative laws in EU countries, representing cooperative organizations as voluntary united farmer organizations, functioning according to democratic principles. The basic regulations are mentioned in the statutes of the International Cooperative Alliance (ICA). ICA is an independent, non-governmental association which unites, represents and serves co-operatives worldwide. Founded in 1895, ICA has 230 member organizations from 92 countries active in all sectors of the economy. Together these co-operatives, with more than 800 million individual members worldwide, are represented (ICA, 2006).

From the International Cooperative Alliance's (ICA) annual report, which describes not only the cooperative movement at the world level, but also at the regional level, it is obvious that cooperative organizations are maintaining a strong position both in the market and within European society. In total, there are, at present, more than 267 000 cooperatives operating in the EU, 46 000 of which are agricultural cooperatives, with more than 5.4 million members.

Among the EU countries Italy has the largest number of agricultural cooperatives. Germany is distinguished by the highest number of cooperative organizations and by the number of people employed by them. At the same time such countries as the Netherlands, Ireland and

Sweden have the most economically developed cooperatives, in comparison with the other countries, despite the fact that they do not have a huge number of them.

Data in Table 1 display the description of the EU food cooperatives over several consecutive years in different fields of the agricultural sector and service market. The share of the cooperatives is especially high in milk production (in some of the countries it constitutes more than 90% of all milk production), while in crop growing, it comprises approximately 80%.

Table 1: Average (%) *market share of the food cooperatives in the EU, 2003-2005*

	Milk	Fruits and Vegetables	Meat	Crops and Stern	Recourses Provision
Belgium	50	70-90	20-30		
Denmark	93	20-25	66-93	87	59-64
Germany	55-60	60	30		50-60
Greece	20	12-51	5-30	49	
Spain	35	15-40	20	20	
France	49	35-50	27-88	75	50-60
Ireland	100		30-70	69	70
Italy	38	41	10-15	15	15
Luxemburg	80		25-30	70	75-95
Netherlands	82	70-96	35		40-50
Austria	90		50	60	
Portugal	83-90	35			
Finland	94		68		40-60
Sweden	99	60	79-81	75	75
Great Britain	98	35-45	2	20	20-25

Source: Papzov, 2007

Food cooperatives in the EU dealing with purchasing, manufacturing and marketing of food products are the most successful and efficient. The key position is held by the marketing cooperatives which characterize the specialization field of the business for the producing and processing enterprises under existing market conditions (Papzov, 2007).

Nowadays, cooperation can be characterized by the process of internationalization. In recent years, the collaboration between American, Canadian and EU cooperatives has significantly increased cereal, oil-bearing and fodder crop production. It is reflected in the establishment of multinational cooperative organizations like Animedica International, Ecord, etc.

3. *The performance of the cooperation in Greece*

The modern co-operative movement was initiated in Greece at the beginning of the 20th century in the region of Thesally (central Greece), with the establishment of a cooperative whose aim was to finance the provision of agricultural machinery (Kontogeorgos, 2001). At present, there are about 7 000 agricultural cooperatives in Greece, which contribute, to a considerable extent, to the agricultural sector of Greece.

Even though the agricultural sector is not a wealthy one, due to its lack of natural resources, it continues to hold an important position in the economy. Approximately 70% of the land cannot be cultivated because of the soil or because it is covered by forests. Apart from these natural limitations, other reasons include soil erosion, lack of fertilizers, and insufficient capital investment. Agriculture is mostly developed in the plains of Thessaly, Macedonia, and Thrace, where corn, wheat, barley, sugar beets, cotton, and tobacco are harvested.

In recent decades, Greek agriculture has been characterized by an increasing diversification of fruit crops for export. In 1999, agricultural production of principal crops was estimated as follows (in thousands of tons): sugar beets, 2.350; tomatoes, 2.060; wheat, 1.900; corn, 1.900; oranges, 900; peaches and nectarines, 500; olive oil, 378; cotton, 384; barley, 414; apples, 360; and tobacco, 126 (Encyclopedia of the Nations, 2007). For export goods as well as for internally consumed products, the problem of the limited number of brand names or high quality products exists but for the most part, they are not highly recognizable. Despite the existing problems encountered, the agricultural sector is one of the most important in the Greek economy and accounts for about 30 % of the industrial output.

The number of farmers working in agriculture is 3 times that of those working in the same sector in the EU. In addition, the membership of the local co-ops in Greece is equal to the average number of the European market state co-ops (Baourakis, et al., 2002). Greek agriculture generally has been in decline, but is still continuing to occupy an important position in the economy, even though its contribution is diminishing.

At present, the current forms of collective action in the Greek agri-food sector at present can be categorized as follows (Vakoufaris, 2007):

- first and second-degree co-operatives;
- interprofessional organizations referring to types of products (i.e. olive oil, wine) rather than specific products;
- producer groups and associations;
- other forms of collective action.

Most of the companies in Greece are small and medium size enterprises, such as small family plots of less than 5 hectares, compared to the EU 15 average of over 16 hectares. These account for three quarters of farmland, and around 60% of farms are situated on hilly or mountainous terrain (OECD, 2008). Hence, cooperatives play the greater role in the development of the agricultural sector, because their formation has been another method of agricultural production support, while overcoming the limitations of small landholdings and fragmentations. The Greek government is supporting cooperatives, or some aspects of their activities, as part of its agricultural policy.

The cooperative structure was built up vertically with provincial cooperative unions and a national federation of unions. Today, cooperatives are formed in a particular structure, consisting of three levels. There are more than 6 000 first-degree food cooperatives in Greece. Local cooperatives function in a rural surrounding, dealing mostly with the supply of farm inputs, processing, exports, imports, packaging, insurance and marketing of production. They can be distinguished as multi-purpose cooperatives with varied kinds of activities (marketing, production, fishing, requisite, diverse).

The types and numbers of cooperatives are displayed in Table 2.

Table 2: *Number and categories of local cooperatives in Greece*

Type of local co-ops	Number of co-ops	Number of members
Multi-purpose	4224	500682
Marketing	476	80475
Production	1966	272430
Fishing	110	4402
Requisite	264	60953
Diverse	143	12117

Source: Bekkum, 1997

The second level of cooperative structure consists of 130 unions from different parts of Greece. Second-degree co-operatives deal mostly with the processing of food products and their marketing. Some of them use their own supermarkets, through which they trade some of the products.

The central unions of cooperatives were formed by the 185 unions and 23 local cooperatives, carrying out the marketing activities of one product or similar products at the national or regional level: "Kydep" (cereals), "Ksos" (raisins), "Elaiourgiki" (olive oil), etc. (Van Bekkum, et al., 1997). At this level, there are 10 unions concentrating on the marketing of one particular product (wine, olive oil, citrus-fruits) (Zopounidis, et al., 2006).

Cooperatives are allowed to form companies or unions with each other or with some other forms of business and public organizations. The membership is explicitly linked to freedom of entry and exit, but a member should remain in a cooperative for at least 5 years. Liability is valid for one year after the departure of a member. The income of the cooperative is distributed in proportion to patronage (Van Bekkum, et al., 1997).

In order to take part in the social dialogue, co-operatives must be a member of a national sectoral co-operative organization. One of those organizations is PASEGES (The Pan Hellenic Confederation of Unions of Agricultural Cooperatives). It is a non-profit organization, where the participation is direct in the agricultural sector, through the Greek Economic and Social Committee. This organization represents the individual members of cooperatives. PASEGES is made up of agricultural cooperatives (primary organizations) and organizations of agricultural cooperatives (second-level organizations) (Eurofound, 2007). PASEGES is a member of international organizations such as the International Cooperative Alliance (ICA) of Europe and COPA-COGECA.

One more basic organization is GESASE (General Confederation of Greek Agricultural Unions). It was established in 1957. Nowadays, it represents farmers who are usually also members of local agricultural unions and federations. GESASE is made up of federations in 35 of the country's prefectures, as well as a number of local agricultural unions. Estimates place the number of farmers who take part in the operating processes of the local agricultural unions at 350,000 (Eurofound, 2007). GESASE is a member of both COPA and GEOPA-COPA, and takes part in relevant rural development policy-making committees.

4. Cooperatives as an organizational form in Crete

The current research is concentrated on the cooperatives of Crete, located on the southern border of Greece. This region was selected due to its importance for the whole country in terms of agriculture and food manufacturing. Crete is one of Greece's leading regions in the production of olives and olive oil, grapes, citrus fruits, and the carob bean, which are mostly exported to the mainland. One fifth of the island's land is entirely unproductive, and nomadic grazing of sheep and goats is widespread.

The region produces about 5.2% of the total national GDP. Furthermore, the annual growth rate between 1996 and 2001 remained below the national average (3.02% versus 3.78%). Lastly, GDP growth for Crete as a whole during the period is largely attributable to population growth, the highest in Greece (OECD, 2005). Moreover, more than 50% of the whole population of the island is employed in agriculture. The most developed branches in Crete's agricultural sector are stock breeding and plant growing. Stock breeding has traditionally played an extremely important role in the life of Cretan natives. Besides that, olive growing and viticulture are important for the agricultural sector. Agriculture in Crete essentially affects not only Cretan economic and social development, but also the economic indices of the entire country. With a share of 6%, Crete ranks 4th among other regions of Greece with regard to the number of active enterprises.

In Crete, as well as in the rest of the country, the cooperative structure was built up vertically with provincial cooperative unions and a national federation of unions. Nowadays, this structure occurs in the formation of the cooperative. There are approximately 650 cooperatives in Crete, which are categorized under 14 unions. This number has decreased in comparison to previous years, because many food cooperatives are facing problems in their negative financial performance. Hence, some cooperatives have been merged to increase their viability. The products produced by Cretan food cooperatives are mostly: cheese, wine, fruits, vegetables, and olive-oil.

Due to the fact that cooperatives in Crete were established many years ago, they are following an old-fashioned model of conducting their business. That is why for these enterprises it is sometimes hard to adapt to the rapidly changing market conditions. Most of them do not use or cope with their invested capital in the most efficient way. They are always facing high overhead costs, and there is a general imbalance in the invested capital structure (Baourakis, et al., 2002).

In this research, attention was paid to food marketing cooperative unions in terms of correlation between their viability, existing problems, diminishing profitability and the size of

the companies, measured by their total assets. The whole sample consists of food cooperatives functioning under the same economic conditions and manufacturing similar products, but all of them are of different sizes. For the purpose of the research size estimation was carried out by determining the size of their total assets.

5. Case study
5.1. Methodological framework

The analysis in the current research was done based on a sample of 15 food marketing cooperatives located in different areas of Crete. All the cooperatives are undistinguished by their specialization and geographical region and, consequently, the common characteristic for this sample of agricultural enterprises is that the economic conditions, such as financial risk, market uncertainty, cost of raw materials, price level on the market and legal framework, are the same for all of them in the particular industrial sector.

In order to examine the financial activity of food cooperatives in Crete, their financial statements (balance sheets and profit and loss accounts) for 4 years (2003 to 2006) were examined. All the financial data for 15 Cretan cooperatives for the current research was gathered through personal interviews with the managers of these enterprises.

A number of ratios were found to be significant indicators of the financial performance of these cooperatives.

The next step in the analysis used in the current research is to reduce the number of estimated financial ratios in order to pick those which affect the model significantly. The most frequently appearing ratios throughout the years under examination are those which were kept and utilized in our further analysis, which was carried out using the PROMETHEE II multicriteria method (Kalogeras,et al., 2004).

5.2. Methodology of the PROMETHEE

The evaluation of the financial performance of the cooperatives under research was performed via the PROMETHEE II. The multicriteria method PROMETHEE II (Preference Ranking Organization METHod for Enrichment Evaluation) is an appropriate method for problems with several multiple criteria, which must be taken into consideration. Hence, the

PROMETHEE outranking approach was chosen for the purpose of this research. In this section, the PROMETHEE algorithm is briefly explained, before application to the case study is described.

This method is based on the theory of outranking relations which constitutes a particular methodological current of multicriteria analysis. All the techniques based on the theory of outranking relations operate in two stages. In the first stage the development of an outranking relation between the examined alternative activities is pursued. In the second stage the exploitation of the outranking relation is fulfilled so that the result of evaluating alternative activities can be exported in a desirable form (classification, hierarchy, choice) (Doumpos, et al., 2004).

The entire methodology is based on the outranking relation, which is a binary relation. This relation allows the estimation of the strength of outranking of an alternative activity x_i against another alternative activity x_j. According to the level of importance, each criterion is given a weight p. The weight increases with the importance of the criterion. The criteria's weights constitute the basis for the assessment of the degree of preference for alternative x_i over alternative x_j (Kalogeras, et al., 2004).

In PROMETHEE, six types of preference functions are used to assess the differences between the alternatives in the evaluation criteria. In this study the Gaussian function is used:

$$P_k\left(x_i, x_j\right) = 1 - exp\left(-\frac{\left(x_{ik} - x_{jk}\right)^2}{2\sigma_k^2}\right)$$

where x_{ik}, x_{jk} are the descriptions of the alternatives on criterion k, and σ_k a user-defined parameter.

The partial preference index evaluation $P_k\left(x_i, x_j\right)$ ranges between 0 and 1. The higher it is (e.g. when $P_k\left(x_i, x_j\right) \approx 1$), the stronger the preference for activity x_i over activity x_j on criterion k. The partial preference indices are aggregated into a global preference index $\Pi(x_i, x_j)$ as follows:

$$\Pi\left(x_i, x_j\right) = \frac{\sum_{k=1}^{n} W_k P_k\left(x_i, x_j\right)}{\sum_{k=1}^{n} W_k}$$

where n is the number of criteria and W_k is the weight of criterion k.

Similarly to the partial indices, the global preference index ranges between [0;1] and represents the overall degree of preference for x_i over x_j.

The results of all the pair-wise comparisons are then used to assess the overall performance of each alternative x_i as follows:

$$\Phi(x_i) = \sum_{j=1}^{m} \Pi(x_i, x_j) - \sum_{j=1}^{m} \Pi(x_i, x_j)$$

where *m* is the number of alternatives in the sample.

This net flow score ranges between [-*m*+1, *m*-1]. The case of

$$\Phi(x_i) \approx m+1$$

indicates that alternative x_i is strongly preferred over all the other m-1 alternatives, whereas

$$\Phi(x_i) \approx -m+1$$

indicates that each of the other *m*-1 alternatives are strongly preferred over x_i. This methodology helps to estimate the viability of cooperatives and to give a rational evaluation of their financial activity (through the financial ratios).

For the purpose of the current research PROMETHEE methodology was used to describe the evaluation and ranking of food marketing cooperatives, according to the criteria, chosen from the most essential indicators of the financial analysis. In this study, the Gaussian preference function was used for all financial ratios. The use of the Gaussian form requires only the specification of one parameter.

The different criteria weight scenarios in PROMETHEE II were presented, assuming that first of all, the weight for each criterion is a uniformly distributed random variable in [0,1] and, moreover, the weights are normalized in order to sum up to one.

5.3. Criteria modeling

In the current study, the following multicriteria problem was considered: 11 out of 15 criteria were chosen from a factor analysis (the analysis was carried out with the help of SPSS). These criteria involve the efficiency of the use of assets and borrowed funds. Table 3 shows the number of ratios used for SPSS analysis.

Table 3: *Financial ratios used for the factor analysis of agricultural producing cooperatives*

Net profit margin	NET PROFIT/SALES
Return on equity (ROE)	NET PROFIT/OWNER'S EQUITY
Total assets turnover ratio	SALES/TOTAL ASSETS
Fixed assets turnover ratio	SALES/FIXED ASSETS
Current ratio	CURRENT ASSETS/CURRENT LIABILITIES
Inventories turnover ratio	SALES/INVENTORIES
Accounts receivable turnover	SALES/RECIEVABLES
Turnover ratio of working capital	SALES/ (CURRENT ASSETS-CURRENT LIABILITIES)
Gearing	LONG-TERM LIABILITIES /(EQUITY+LONG-TERM LIABILITIES)
Ability of loaning indicator	NET INCOME/TOTAL LIABILITIES
Debt ratio	TOTAL LIABILITIES/TOTAL ASSETS

These were considered to be the useful indicators of the financial performance of the cooperatives under investigation. Four ratios (Gross Contribution Margin, Capital Turnover Ratio, Current Liabilities Turnover Ratio and Quick Ratio) were excluded from the model, as they were deemed to be insignificant.

Since there are 11 criteria which have to be taken into consideration simultaneously, their analysis was made using the PROMETHEE multicriteria method (Preference Ranking Organization Method of Enrichment Evaluations) (Brans, et al., 1986).

6. Obtained results

The evaluation of the financial performance of food cooperatives was conducted with the help of the PROMETHEE II multicriteria method, because several conflicting criteria had to be taken into consideration. By using the PROMETHEE II methodology the ranking for the sample of 15 food cooperatives was obtained. The ranking is determined on the basis of the net flows obtained through the PROMETHEE II method (high net flow corresponds to high financial performance and vice versa).

In order to determine the weights of the selected financial ratios, 500 different scenarios were examined to discern the significance of the selected ratios tested (Baourakis, et al., 2002). All scenarios were analyzed with the help of Matlab.

Net flows according to the performance of the financial activity for each cooperative were calculated. The higher the PROMETHEE score, the better the ranking of a cooperative. Table 4 presents the scoring for the food cooperatives under examination for the period 2003-2006.

Table 4: *PROMETHEE ranking results (net flows)*

AGRICULTURAL UNIONS	PROMETHEE SCORING			
	2003	**2004**	**2005**	**2006**
Agricultural union of Apokoronas	-0.094	-0.039	-0.038	-0.044
Agricultural union of Iraklion	-0.117	-0.084	-0.086	-0.069
Agricultural union of Lasithi	0.122	0.201	0.127	0.067
Agricultural union of Milopotamos	-0.002	-0.011	0.096	0.032
Agricultural union of Rethimno	-0.035	-0.098	-0.123	-0.127
Agricultural union of Sitia	0.204	0.126	-0.114	0.064
Agricultural union ASEAR	-0.032	-0.058	0.072	0.039
Agricultural union of Ierapetra	-0.019	0.039	-0.001	-0.039
Agricultural union of Selinos	-0.017	-0.050	-0.058	0.093
Agricultural union of Monofatsio	0.071	0.093	0.081	-0.016
Agricultural union Meramvelo	0.108	0.034	-0.018	0.087
Agricultural union of Messaras	0.087	0.112	0.163	0.156
Agricultural union of Peza	0.020	-0.036	-0.025	0.000
Citro-producers of Crete	-0.114	-0.065	-0.008	-0.137
Agricultural union KSOS	-0.181	-0.163	-0.068	-0.105

Table 5: *Food cooperatives' ranking results, 2003-2006*

Ranking	2003	2004	2005	2006
1	Sitia	Lasithi	Messaras	Messaras
2	Lasithi	Sitia	Lasithi	Selinos
3	Meramvelo	Messaras	Milopotamos	Meramvelo
4	Messaras	Monofatsio	Monofatsio	Lasithi
5	Monofatsio	Ierapetra	ASEAR	of Sitia
6	Peza	Meramvelo	Ierapetra	ASEAR
7	Milopotamos	Milopotamos	Citro-producers of Crete	Milopotamos
8	Selinos	Peza	Meramvelo	Peza
9	Ierapetra	Apokoronas	Peza	Monofatsio
10	ASEAR	Selinos	Apokoronas	Ierapetra
11	Rethimno	ASEAR	Selinos	Apokoronas
12	Apokoronas	Citro-producers of Crete	KSOS	Iraklion
13	Citro-producers of Crete	Iraklion	Iraklion	KSOS
14	Iraklion	Rethimno	Sitia	Rethimno
15	KSOS	KSOS	Rethimno	Citro-producers of Crete

According to the obtained results, the changes in the ranking of food cooperatives are quite considerable from year to year. Cooperatives are maintaining approximately the same position in the ranking list during the examined period, as displayed in Table 5. According to the ranking results, cooperatives can be divided into several groups. The first group refers to those cooperatives whose position is improving from year to year. In this case, these are only two: the agricultural unions of Messaras and Iraklion. The second group consists of the cooperatives whose position is constantly declining on the ranking scale; there are no such enterprises in our case. The third group gathers cooperatives with slight changes in their ranking. The most part of the cooperatives belongs to this group: the agricultural union of KSOS, Rethimno, Peza, etc. The last group refers to the cooperatives which exemplified drastic changes, like the agricultural union of Monofatsio, the Citro-producers of Crete, and the agricultural union of Sitia, among others.

To summarize the results of the discussion above, the average indicators were calculated for the whole period and are displayed in Table 6. Moreover, the ranking for the sample of food

cooperatives by size of total assets was also made. The comparative assessment of the financial activity performance and the size of their assets are summarized in Table 6.

Table 6: *Classification of food cooperatives by their efficiency and size of assets, average 2003-2006*

AGRICULTURAL UNIONS	PROMETHEE SCORING	PROMETHEE RANKING	RANKING BY THE SIZE OF ASSETS
Agricultural union of Apokoronas	-0.195	14	7
Agricultural union of Iraklion	-0.112	12	1
Agricultural union of Lasithi	0.085	4	14
Agricultural union of Milopotamos	0.060	5	8
Agricultural union of Rethimno	-0.116	13	4
Agricultural union of Sitia	0.012	8	2
Agricultural union ASEAR	0.119	3	5
Agricultural union of Ierapetra	-0.039	11	10
Agricultural union of Selino	-0.005	9	13
Agricultural union of Monofatsio	0.046	6	11
Agricultural union of Meramvelo	0.168	2	15
Agricultural union of Messaras	0.180	1	9
Agricultural union of Peza	0.034	7	3
Citro-producers of Crete	-0.024	10	12
Agricultural union of KSOS	-0.212	15	6

The results of the analysis indicate that the best agricultural union was Messaras. This cooperative, located in Iraklion, specializes in the production of grapes and olive oil. But by the size of its total assets, it was ranked 9th, indicated that this company is of medium size, compared to the others in the ranking list.

The agricultural union of Meramvelo, which is the smallest enterprise in terms of assets, ranked second. Hence, due to its efficiency and most probably the right choice of the market share, the performance of this food cooperative was high.

The agricultural union ASEAR, which is located in the Rethimno prefecture, is a large company with a capital of more than 1 500 000 EUR, producing mostly forage and birdseed. ASEAR was ranked 3rd according to the PROMETHEE scoring and 5th according to size of total assets.

Despite the size of its assets, the agricultural union of Iraklion ranked in 12th place. Nowadays, the union handles 70% of table grape production, 40% of wine and 50% of olive oil produced in the prefecture of Iraklion. Holding a large number of fixed assets and the biggest

number of current assets due to ineffective management, they find themselves ranking at the end of the list.

Another comparatively large cooperative, in accordance to its assets, Sitia, which specializes in wine and olive oil production, was ranked in 8th place, while it is the biggest in proportion to its assets after the agricultural union of Iraklion.

Actually, all the cooperatives are facing similar problems. The most common setback is weak financial management. As a result, there are several structural weaknesses in the cooperative organizations, incorrect resource allocation, and wrong attitude towards debts. The long-term obligations cannot be covered. In combination with a drastic decrease in sales and a low level of assets, cooperatives in Crete are not able to meet competition in the agri-market.

Hence, the conclusion can be made that despite the generally accepted idea about positive correlations between the size of the company and its financial performance in the food industry, current research shows different results. These two indicators either do not have a very strong correlation or it is negative in the cases of some of the cooperatives (the biggest one). Small enterprises found themselves on the market and, nowadays, they are effectively operating, even though they are also facing problems in their financial performance.

7. Conclusion

The financial performance of marketing cooperative enterprises operating in the Cretan agro-food market was examined empirically in the current research. The purpose of this study was to rank the cooperatives, to determine the reasons for the existing ranking and to define the correlation between the sizes of the companies and their position in the ranking list. The results of the analysis, which provide meaningful information for researchers investigating the food sector, were obtained using the PROMETHEE methodology. The simultaneous use of various criteria provides robustness in the results, due to the examination of different scenarios with different weights. Moreover, apart from the use of simple statistical models for the current methodology, the results obtained for the ranking of food cooperative enterprises are easy for decision makers to understand and interpret.

The results of the current research indicated very weak correspondence between the position of the cooperatives in the ranking list and their size. Hence, it can be concluded that there are many other factors which affect the financial performance of the food cooperatives. Some of them are: weak management, which causes problems of ineffective resource allocation in their use; high loan burdening and low liquidity levels; underdeveloped marketing

management, including the absence of certain market niches and non-recognizable brand names; and lack of knowledge concerning the rural society, among many others. Furthermore, the absence of competitive market strategies such as product differentiation, market segmentation, specialization, and diversification, prevents increases in profit margins and expansions in demand (Baourakis, et al., 2002). To overcome the problems which were mentioned above, not only changes within the enterprises, but also government and cooperative organizational support are required.

The results obtained from the current study can be used for further research aimed at the exact determination of the correlation between the financial performance of the food cooperatives and the size of the enterprises, which was estimated by the size of total assets in the current study.

Further research should pay attention to these weak points and take into account the detailed measures that should be adopted. Future studies should concentrate on the remaining criteria considered in the current paper, and their measuring for a deeper explanation of the obtained ranking of the food cooperatives. Researchers should focus on the multicriteria decision support systems, which can be used as a meaningful tool for the development of the cooperatives in the food sector of the Cretan market.

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