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Delphi method applied to horticultural cooperatives

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Abstract

Purpose – Agricultural cooperatives have been able to become a strong and consolidated organizational form, although the new challenges of globalization and trade liberalization require changes in the strategic approach. The requirements of the distribution companies, consumers and government about the concentration of demand, traceability, food safety and respect for the environment had led to a thorough reorganization of agricultural food systems. So it is necessary to undertake a strategic review of horticultural cooperatives in order to conduct a strategic assessment and hence identify the strategic actions to be followed in the coming years. This paper seeks to address these issues.

Design/methodology/approach – An empirical study has been carried out during the first half of 2011 consisting in the application of the Delphi method and sending a questionnaire to experts whose purpose was to gain a view of the strategic situation of horticultural cooperatives in Spain. The Delphi method is a projection technique of the qualitative and subjective type which is appropriate for studies where there is little information on the subject to be analysed, and also for exploratory studies, as it is the case study of examining the role of agricultural cooperatives in coming out of the crisis of Mediterranean agriculture.

Findings – The performed Delphi analysis revealed that Mediterranean agriculture suffers from a severe crisis for which the solutions are hard to find, although the existence of the agricultural cooperatives and certain specific forms of performance and financing can partly improve the described situation. The application of the SWOT analysis based on the opinions of the experts provided sufficient detailed insights of the actual situation of the cooperatives. Thus, from the Delphi SWOT applied to Mediterranean agriculture and agricultural cooperatives, the authors can make some important assessments which are included in their paper.

Originality/value – It is a forward-looking analysis that tries to give measures to the sector, but measures that come from the sector, in order to face the Mediterranean agriculture crisis.

Keywords Delphi method, Strategic analysis, Strategy design and evaluation, Horticultural cooperatives, Horticulture

Paper type Research paper

1. Introduction

Agricultural cooperatives represent an alternative to the economic crisis in which Mediterranean agriculture currently finds itself, and they also play an important role within the rural environment in which they operate (Juliá and Marí, 2002; Ruiz *et al.*, 2006). Through joint cooperative commercialization, their bargaining power versus commercial distribution companies has increased – as the latter try to impose agricultural prices – and the high costs of production factors are partly reduced; in particular those corresponding to labour costs (Monzón, 2003; Fernández-Zamudio

Management Decision
Vol. 50 No. 7, 2012
pp. 1266-1284

0025-1747
DOI 10.1108/00251741211247003

et al., 2006; Valentinov, 2007). However, the existence of low horticultural product prices and high fixed production costs – coupled with the economic and financial crisis which began in summer 2007 – have adversely affected the financial and economic situation of agriculture in general and horticultural cooperatives in particular.

From this perspective, agricultural cooperatives have become a robust, consolidated organizational form (Rojas, 2007), although the new challenges of globalization and trade liberalization require changes in strategic approach (Meliá and Juliá, 2008). The requirements of distribution companies, consumers and government regarding the concentration of demand, traceability, food safety and respect for the environment has led to a thorough reorganization of agricultural food systems (Filippi and Triboulet, 2006; Gallego, 2008).

It is thus necessary to undertake a strategic review of horticultural cooperatives in order to conduct a strategic assessment through which their successes and strengths can be determined, as well as their weaknesses, threats and opportunities, and thereby identify strategic actions for the coming years. To this end, an empirical study has been carried out during the first half of 2011 consisting of the application of the Delphi method and using a questionnaire answered by experts whose purpose was to gain an overview of the strategic situation of horticultural cooperatives in Spain.

The paper is divided into five different sections, including the introduction. The context of the investigation is described in the second section, describing the rationale for the methodology, the list of experts participating in the study and the composition of the questionnaire used. The third section discusses the research findings of the strategic assessment and the identification of the strategic actions for horticultural cooperatives. The final section presents the major findings of the study.

2. The research context

According to Dalkey and Rourke (1971), the Delphi analysis can be used for two main purposes: for predictive purposes, i.e. extracting information for future scenarios (Fildes *et al.*, 1978), and to seek views on a particular topic on which no prior information is available (Gupta and Clarke, 1996). The main characteristics of the Delphi method are: it is an iterative process, i.e. the experts can repeat the process several times (rounds), the anonymity of the participants is maintained throughout the process (to prevent groupthink), the feedback of the participants is monitored to ensure noise-free transmission (no redundant and erroneous irrelevant) and a statistical response is obtained by the group from individual opinions (Seguí and Server, 2010b). It is objective in the sense that a reliable group opinion can be obtained from a panel of experts (Landeta, 1999).

This method has the advantages of group techniques (involving different people, creativity, different points of view) but without any of the limitations imposed by the group's political, social and personal pressures. However, its main limitation lies in the potentially emotional and subjective responses, since these can be conditioned by the beliefs, feelings and expectations of the participants (Dalkey and Rourke, 1971; Gupta and Clarke, 1996).

2.1 Justification of the methodology

In light of these observations, we believe that the Delphi Method is an appropriate technique for analyzing the problem addressed in this paper. The strategic analysis of

the agricultural cooperatives affected by the Mediterranean agriculture crisis is a subject on which there are no statistical data and which requires reflection and group analysis. The focus of study requires information about future scenarios (to propose solutions) from the opinions of different experts on the subject, because it is a useful means of reaching conclusions on the future of this sector. It is therefore a subjective issue that requires the analysis of qualitative variables and subsequent predictions for which the Delphi method is a suitable tool (Okoli and Pawlowski, 2004; Castella and Gutiérrez, 2007). The Delphi method is also appropriate for conducting a SWOT analysis as reflected in previous studies (Campos and Sanchis, 2001; Martín, 2004), as well as for studying quality and innovation (Castella and Gutiérrez, 2007; Mateos and Server, 2009).

This technique has been used in previous studies on cooperatives and above all in the agricultural cooperatives and credit sections.

Credit cooperatives have also been examined using the Delphi method to analyze the role of human capital in economic efficiency (Seguí, 2007; Seguí and Server, 2009; Seguí and Server 2010a, b). Finally, another sector within Social Economy where Delphi has been applied is for insertion companies (Melián, 2011), with the aim of examining the legal implications on the functioning of these companies and to design a SWOT matrix.

We can conclude, therefore, that the Delphi Analysis is a suitable qualitative technique for the study of the current status and to make future proposals for agricultural cooperatives within the framework of Mediterranean agriculture.

2.2 The group of experts

The panel consists of two different profiles:

(1) Academics specialized in agriculture, agricultural cooperatives and agricultural finance.

(2) Both industry professionals and technical personnel who work in public and private institutions related to the sector, such as managing directors of the cooperatives which are the focus of our study.

A balanced sample of experts within the two profiles shown has been created, taking into account that the response rate of the professionals' profile, particularly that of cooperative managers, will be much lower than the response rate of academics. In this sense, the questionnaire was sent to a total number of 40 experts. Table I shows the composition of the panel.

As shown by Table II, a geographical balance was sought for panel members, bearing in mind that the study area includes the Valencia Region and Catalonia, and most fruit and vegetable cooperatives are located in the Valencia Region.

2.3 Design and layout of the questionnaire

The questionnaire is the most important tool of the Delphi analysis, and the feedback from the rounds of questions improves the quality of the final outcome of the research as a result of better quality, greater convergence of individual estimates by the experts and an enhanced ability to predict the reactions of the people involved in the study. The number of rounds or iterations that should be made is determined initially by consensus but, as this may hide subgroups of opinion and force experts to conform, the

	Academics		Professionals		Total experts	
	M	K	M	K	M	K
Strengths						
Images and roots of the territory	5	0			5	0
Channel diversification	4.5	0.5			4.5	0.5
Water use	4	0.75	4	1	4	1
Existence of the agricultural cooperatives	4.5	1	4	1	4	1
Research capacity	4	0	3	0.5	4	1
Strong export position	4	1	4	1	4	1
Weaknesses						
Dispersion of the agricultural supply	4	1	4	1	4	1
Small-sized farms	4	0.75	4	1.5	4	1
Ageing population	4	1	4	1.5	4	1
Part-time work prevalence	4	0.75	3	1	4	1
Opportunities						
Use of ITC	4.5	0.5			4.5	0.5
Groups of agricultural producers	4	0	4	0.5	4	0
Proximity to markets	4	1	4	1	4	1
Traceability of products	4	0.75	4	1	4	1
Threats						
Concentration distribution	5	0.75	5	0.5	5	1
Common agricultural policy	4	1	4	1.5	4	1

Table I.
SWOT matrix of Mediterranean agriculture

	Academics		Professional		Total experts	
Percentage	Number	(%)	Number	(%)	Number	(%)
Valencia	9	75	20	71	29	72
Catalonia	3	25	8	29	11	28
Total	12	30	28	70	40	100

Table II.
Structure of the initial sample of experts selected

stability criterion is increasingly being used. However, this latter approach of avoiding pressure on the experts to reach consensus is difficult to measure. The general recommendation is to perform two to three iterations, subject to the willingness of the experts to participate.

The ultimate goal of Delphi analysis is to reach a group result that is greater than the sum of the individual contributions obtained by each of the experts without interacting. As there may be subgroups of experts with varying estimates in the group, it is advisable to carry out a different statistical study of those subgroups. Spearman's rank coefficient (r_s) can be used to identify subgroups of experts, defined as $r_s = 1-6(X_i-Y_i)^2/n(n^2-1)$, which measures the degree of linear association between the ranges X and Y. Its value ranges between -1 and 1. The closer to 1, the stronger the linear association and the lower the difference in the behaviour of the subgroups of experts (Seguí, 2007; Camisón and Cruz, 2008).

The questionnaire used in the research consists of six different questions of the numerical assessment type using a Likert scale from 1 (lowest) to 5 (highest). The possibility of the experts adding new variables arose in all questions. This

questionnaire was sent, along with an introduction letter, to different experts selected by e-mail, a method that allows a faster delivery and response, facilitating completion.

Prior to the six issues that form the questionnaire, two questions related to specific information from experts were also included and in order to weigh and segment the results of the study. These include the expert's year of birth, and the degree of knowledge corresponding to the three areas related to the study: agriculture, agricultural cooperatives and financing, and credit unions and credit sections. For each of these areas, the experts were asked to self-assess their knowledge based on a numerical scale from 1 (minimum) to 10 (maximum).

The six questions comprising the questionnaire can be structured into two distinct parts. The first part of the questionnaire corresponds to the SWOT analysis (the first two questions), so that the first question, which is divided into four different sections (strengths, weaknesses, opportunities and threats), experts are asked to assess on a Likert scale from 1 to 5 a set of variables related to the internal situation and external conditions of Mediterranean agriculture. The second question (numerical rating from 1 to 5) concerns the steps that would be required to compensate for the weaknesses and address the threats. The second part of the questionnaire includes four questions, which refer to the global strategic funding actions that agricultural cooperatives can implement to deal with the crisis of Mediterranean agriculture. The experts were also asked to state a numerical value using a Likert scale from 1 to 5 on the following subjects – financing aspects of agricultural cooperatives, global strategic actions to be followed by agricultural cooperatives and mergers and strategic alliances, the financial instruments they have at their disposal, agricultural cooperatives and other aspects of a functional nature, such as human resources (managers, professional management and employee training) ICT, Marketing, Accounting and Quality. For the last two issues, the questionnaire differentiates between the importance of each of the actions proposed and the current situation in which they occur in agricultural cooperatives.

Once the answers in the first round of the study had been analyzed, a second questionnaire was designed for the second and final round of the study. The second questionnaire included a statistical response of the group results from the first round, and the individual responses of the experts. In this way, experts could assess the possibility of modifying those individual responses that had been left out of the interquartilic range (dissenting responses). Each expert could confirm his/her initial answer, maintain the same answer providing a justification, or change the answer to bring it closer to the group's choice.

The process of sending the questionnaires (rounds) ends when it is seen that the estimates remain stable, i.e. when the median changes only slightly and the interquartilic range ceases to narrow. The last round (a minimum of two) provides the group's final answer and the final report is drafted according to the answers therein. It is convenient to submit this report to the participating experts as compensation for their collaboration. The report must include the following contents (Seguí, 2007): a description of the context in which the study was undertaken (objectives, methodology, etc.), technical data specification about the participants (make-up of the coordinating group and membership criteria of the expert panel at aggregate level), evolution of the opinions through the different iterations (medians, interquartilic range, standard deviation, etc.), final results (majority opinions and level of consensus, etc.) and subgroup analysis and shared scenarios on which the results were based.

3. Statistical data analysis

The 21 people who took part in the study answered all of the issues raised and there was no error in the answers. However, in the second round, some participants left some of the new issues unanswered as they did not consider them significant. Among the statistical criteria that had been considered for the exploitation of survey data, the following should be noted: the selected group's answer to each question corresponds to the median (M), as this is the central point of the trend in the group's response; the degree of dispersion of the sample was determined from the interquartilic range (k), measured as the difference between the third and first quartile. The greater the range, the greater the degree of dispersion; in the first round, the degree of dispersion matches the degree of consensus in the answers. Unanimity happens when $k = 0$ and an acceptable degree of convergence is considered (consensus) when the relative frequency of an answer is greater than or equal to 80 per cent, or alternatively when k is equal to or less than 1. In the second round, the degree of dispersion or consensus is replaced by the stability criterion, i.e. the probability that the group's answer will change or not in the short term. This criterion is measured by the relative interquartilic range variation (r), defined as the difference between the relative interquartilic ranges of two successive rounds ($Vr = rj - ri$). When this value is between 0.25 and 1, it is considered to have achieved a satisfactory level of stability in the group's answers; and the arithmetic mean (m), fashion (Md) and standard deviation (SD) have also been used as complementary measures.

Taking into account the described criteria, the results obtained for each of the studied issues are analyzed in the following.

3.1 Criteria considered in the analysis of the results

The analysis of the results of the study includes the ability to weigh and segment these results in terms of certain variables that were included in the questionnaire. Thus, we first asked the experts to carry out a self-assessment of their knowledge on the three types of areas related to the questionnaire: the agricultural sector, agricultural cooperativism and financing, and credit unions and credit sections. In this sense, it should be mentioned that most of the experts had a remarkable knowledge on two of the topics discussed: the agricultural sector and agricultural cooperatives. The median in both cases is 8 and also in the case of the agricultural sector there is a consensus and the dispersion is minimal or acceptable. In contrast, for the third topic – financing and credit unions and credit sections – the degree of expert knowledge is only sufficient, because the median is 5 and is widely dispersed. The professionals in the group gave higher self-assessments than the academics, particularly with regard to financing and credit unions and credit sections.

We consider that it makes no sense to weigh knowledge in the case of issues relating to the agricultural sector and agricultural cooperatives, since measuring the level of knowledge makes no significant difference because the level of expert knowledge on these two issues is in all cases is remarkably in-depth and even has an acceptable level of dispersion. However, analyzing the issues that deal with financing and credit unions and credit sections is more relevant as the dispersion is high, particularly in the case of academics.

In reference to the weight that each profile represents into the sample, academics represent 47.6 per cent of the experts and professionals represent 52,4 per cent. It should also be mentioned that within the group of professionals, 36.4 per cent are technical (four) and 63.6 per cent are cooperative (seven). By origin, 62 per cent are from

Valencia and 38 per cent from Catalonia. The biggest difference in terms of origin occurs with academics, where 70 per cent come from the Valencia region compared with 30 per cent from Catalonia. Among the professionals, the proportion by origin is very similar: 54.5 per cent from Valencia and 45.5 per cent from Catalonia.

The results of the study are discussed in the following, distinguishing between the different parts of the questionnaire: the SWOT analysis and the strategic actions.

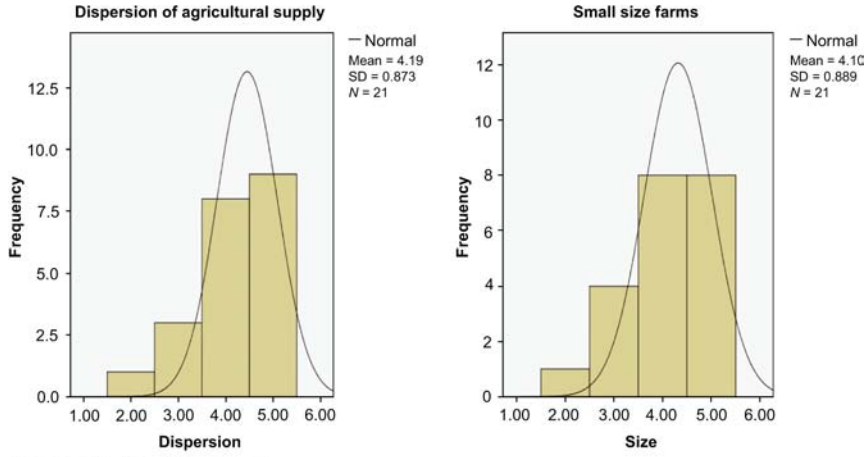
3.2 Results of the SWOT analysis

This section includes four different sets of issues: weaknesses, threats, strengths and opportunities, and possible measures.

The first group of issues relates to weaknesses (see Table I). In general, experts rank the following six factors as the most significant weaknesses of Mediterranean agriculture (with a score of 4 out of 5 and an acceptable degree of consensus or with a k of less than 1): the dispersal of agricultural supply, the small size of farms, the ageing farming workforce, the prevalence of part-time work, difficulties in the introduction of mechanization in farms and difficulties in handing the business down from one generation to another. The results of the second round do not change in relation to the first, as shown by Table I.

The histograms shown in Figure 1 graphically show the frequency distribution of the different variables in the study, as well as the normal distribution, which indicates that the statistical values obtained are representative of all the variables under study[1].

The second group of issues discussed relates to threats (see Table I). The main threats for Mediterranean agriculture are as follows: first, the concentration of distribution channels; second comes the Common Agricultural Policy (CAP); third is occupied by competition from other countries and in fourth place is the potential disappearance of credit unions. The other threats were rated below 3.5 or their interquartilic range is above 1. The results of the second round are the same as in the first round but in this later round we have managed to reduce the degree of dispersion of the answers from experts.



Source: Authors' own work

Figure 1.
Histograms of the variables corresponding to the weaknesses of Mediterranean agriculture

The histograms in Figure 2 graphically show the frequency distribution of the different variables as well as the normal distribution, which indicates that the statistical values obtained are representative for all variables under study.

The third group of issues for analysis addressed the subject of strengths (see Table I). The most significant strengths of agricultural cooperatives identified by the experts are the traditional image and their rooting in the area, diversification of commercialization channels, the efficient use of water resources, the existence of agricultural cooperatives, the ability to search for certain products and the strong export position of some products. The results of the second round confirm those obtained in the first phase (see Figure 3).

In this case, there are significant differences between the views of academics and professionals. On the one hand, academics rank image and the rooting in the region the

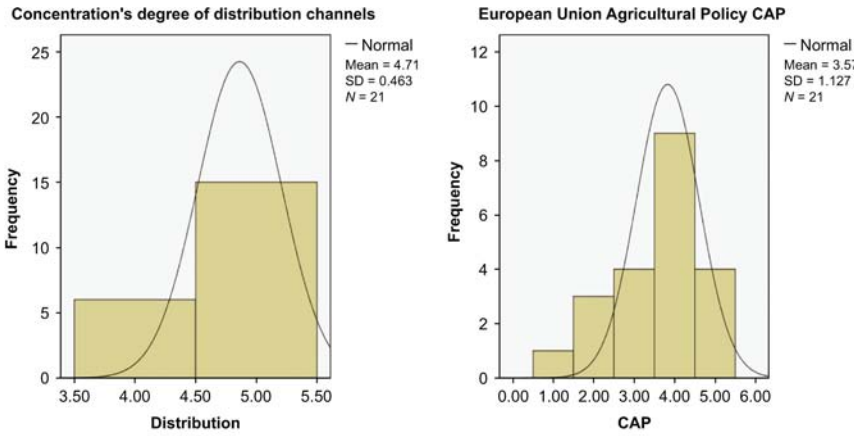


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Figure 2.
Histograms of the variables corresponding to the threats to Mediterranean agriculture

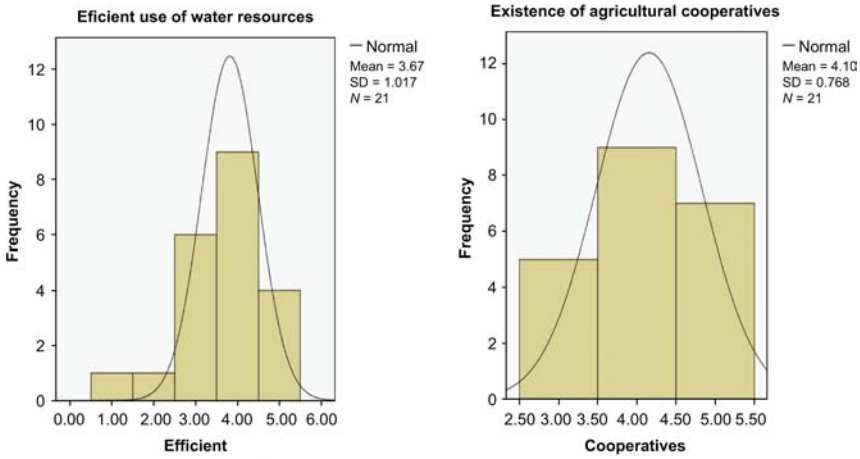

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Figure 3.
Histograms of the variables corresponding to the strengths of Mediterranean agriculture

highest with a value of 4.5 out of 5, as occurred with the diversification of the commercial channels. However, they also rank the existence of second grade agriculture cooperatives with a maximum 5 and a degree of acceptable consensus; and the existence of agriculture cooperatives at 4.5 out of 5. On the other hand, the professionals did not rank image, the rooting in the region or the diversification of commercialization channels and ranked the ability to search for certain products and the existence of second-degree agricultural cooperatives at a lower level.

The fourth and last group of issues discussed concerns opportunities (see Table I). The opportunities identified by the experts are as follows: the use of ICT for marketing agricultural products, the development of agricultural producer groups; geographical proximity to major markets and traceability of agricultural products. The results of the second round confirm the first answers with a reduction (improvement) in the degree of dispersion of responses.

In terms of profiles, there are some noteworthy differences. Academics give a higher rating to the possibilities of organic farming agreements with specialized credit institutions, cooperation in water issues, temperature and solar radiation, outsourcing of farming and environmental significance (3.5 out of 5). For their part, professionals give a lower rating to the importance of organic farming (2 out of 5).

Figure 4 presents the frequency distribution of the different variables, as well as the normal distribution, which indicates that the statistical values obtained are representative.

Having identified the main weaknesses, threats, strengths and opportunities of the Mediterranean agriculture, the possible measures that can be taken in order to eliminate / reduce the weaknesses and to fight the threats detected were discussed.

The measures proposed in order to compensate the identified weaknesses are set out in Table III. The main measure proposed via consensus by the experts is the concentration of agricultural supply. At a second level, the following measures are proposed: achieving economies of scale, offering production diversification, an improvement in levels of professionalism, introduction of ICT in the management of cooperatives, introduction of quality management systems and improvement of

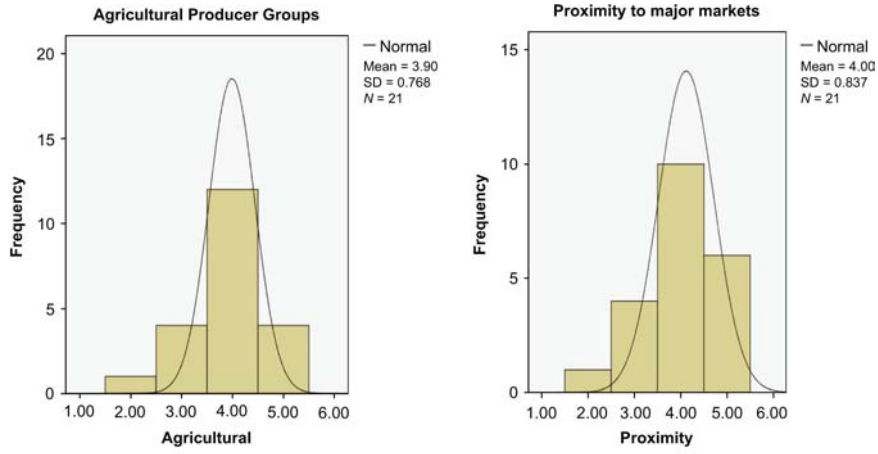

Figure 4.
Histograms of the variables corresponding to the opportunities of Mediterranean agriculture

Source: Authors' own work

	Academics		Professionals		Total experts	
	M	K	M	K	M	K
Measures against weaknesses						
Concentration of supply	5	1	5	0	5	1
Economies of scale	4	0	4	1	4	1
Supply diversification	4	1	4	1	4	1
Improved professionalism	4.5	1	4	1	4	1
The introduction of ICT	4	1	3	1	4	1
Quality management	4	1	4	1	4	1
Measures against threats						
Cooperative agricultural association	4.5	1	5	1	5	1
Improving product quality	4	1	4	1.5	4	1
Cooperative with cooperatives	4.5	1	4	1.5	4	1
Participation in a cooperative group	4.5	1	4	0.5	4	1
Internationalization	4.5	1	4	0.75	4	1

Table III. Measures against Mediterranean agriculture weaknesses and threats

training and qualification of cooperative staff. Other measures are also included but without an acceptable degree of consensus, such as the increase in the size of farms, the creation of cooperative land community farming and the creation of credit sections. Finally, measures to improve the weaknesses are also included, such as the search for new sources of funding and the use of cost accounting. The results of the second round confirm those from the first with a reduction in the degree of dispersion of the experts' answers.

By profile, academics ranked the creation of cooperative land community farming highly, while professionals rank this measure with a score that is below the experts' median. Instead, professionals rank the increase in the size of the farms with a maximum score, while academics value it with a lower score, which is below the experts' median. Improving the professionalism, the search for new sources of funding and the introduction of cost accounting are measures that experts rank above all the experts' median. Finally, professionals consider the introduction of ICT to be below the experts' median.

Finally, the efforts to defend against threats from the environment are listed in Table III. The most valued measure for experts is pooling into agricultural cooperatives (5 out of 5) but the following are also important (with a score of 4 out of 5 and with an acceptable consensus degree): improving product quality, cooperation among agricultural cooperatives, participation in a cooperative group and the introduction of internationalization processes.

The creation and participation of second grade cooperative are ranked at 4 out of 5 but they do not have an acceptable consensus among experts. Finally, other measures which were ranked 3 out of 5 should also be mentioned; for example, preferential agreements with credit institutions specialized in financing the agricultural sector, the outsourcing of certain agricultural activities, the introduction of organic farming and obtaining the designation of origin. The second round of results confirm the first answers and also enhance the degree of acceptability of the results among the experts, since a degree of acceptable consensus for all measures was achieved. By profile, academics rank cooperation with cooperatives, participation in a cooperative group, the processes of

internationalization and the creation and engagement with the second-degree cooperatives above the experts' median, the introduction of organic production and obtaining the designation of origin and preferential agreements with specialized credit institutions and outsourcing of farming activities. For their part, professionals rank the creation of second-degree co-operatives below the experts' median.

3.3 Analysis of the results on strategic actions

The last section of questions corresponds to the various strategic actions that agricultural cooperatives can implement to confront the critical situation facing Mediterranean agriculture. This section includes four groups of different issues: financing strategies that affect agricultural cooperatives, global strategic actions, financial instruments at the service of agricultural cooperatives and other functional activities for Human Resources, ICT, Marketing, Accounting and Quality applicable to agricultural cooperatives.

Table IV shows the main financing strategic actions that may affect agricultural cooperatives when dealing with the effects of crisis in agriculture. The financing strategy that was most valued by experts was the disappearance of the credit.

Finally, other financial actions carried out over recent years such as mergers among rural banks, the transformation of building societies into banks and terms of payment to suppliers were rated at 3 out of 5. The results of the second phase confirmed the first answers and improve the degree of dispersion of the experts' views. By profile, academics ranked the credit crunch above the experts' median, mergers between rural banks, terms of payments to suppliers and the transformation of building societies into banks. In contrast, they ranked unenforceable capital contributions and the requirements of collateral and guarantees by credit institutions at a level below the experts' median In contrast, professionals ranked unenforceable capital contributions and collateral system requirements and collateral guarantees above the experts' median and ranked the disappearance of the credit sections and the transformation of building societies into banks below the median.

It might also be desirable in this case to analyze the results weighed according to the degree of knowledge on financing and on credit unions indicated by the experts themselves. However, differences in the results experienced with the measures were not significant enough to be included in this analysis.

Table IV shows, also, the main financing strategies and financial instruments that agricultural cooperatives can implement when dealing with the effects of crisis in agriculture. In this case, the evaluation was performed twice: on the one hand, the importance of these instruments for cooperatives was ranked, and on the other, the situation or status of these instruments in agricultural cooperatives was also evaluated.

The highest rating for financial instruments of agricultural cooperative services by experts according to its importance was the credit section with a value of 5 out of 5 and an acceptable level of agreement of 1. In second place comes self-financing and grants and subsidies from the European Union with a score of 4 out of 5 and an acceptable degree of consensus of 1. Third, we see that the Operating Fund of the Common Markets Organization CMO and external funding coming from rural banks and other credit institutions (banks and savings banks) is measured with 4 out of 5 but without an acceptable degree of consensus. In fourth place, funding from other partners and private investors was considered with a score of 3.5 and an acceptable degree of

	Academics		Professionals		Total experts	
	M	K	M	K	M	K
Financial strategies						
Disappearance of credit sections	5	1	4.5	1.75	5	1
Customer period billing	4	1	4	2	4	1
Unenforceable capital contributions	3	0	5	0	4	1
Systems guarantee/warranty	3	0	5	0	4	1
Main financing instruments						
Credit section	5	1	5	1	5	1
Self-financing	4	1	4.5	1	4	1
UE grants and subsidies	3	1	4	2	4	1
Real estate instruments						
Credit section	3	1.75	3	3	3	2
Self-financing	3	1	3	1	3	1
EU grants and subsidies	2	1	3	1	2	1

Table IV.
Financial strategies and financing instruments affecting agricultural cooperatives

consensus and in fifth place, grants and subsidies from the central and regional administrations scored 3 out of 5 with an acceptable degree of consensus. These first results are confirmed with those obtained in the second round of research and the degree of dispersion was reduced.

By profile, academics ranked the aid and grants from the EU and also external funding from other lenders different to rural banks and credit sections with a lower value than the experts' median. Professionals gave a higher value than the experts' median to the Operations Fund of the CMO to self-financing and the external funding from rural saving banks and other credit institutions and aid and grants from the Regional and Central Government. The type of issues addressed in this section would require weighing once again depending on the level of knowledge from the experts. With regard to the financial instruments to be analyzed, no instrument obtained a better ranking than 3 out of 5.

By profile, we notice that there is a remarkable difference with regard to external funding from rural banks between academics and professionals who consider it to be less developed together with external funding from other credit institutions. Conversely, professionals ranked the real situation of funding from the European Union more positively.

Table V shows the main global and competitive strategies that agricultural cooperatives can implement when dealing with the effects of agricultural crisis. The most valued strategy for experts is product differentiation through quality and marketing. The results were the same in the second round. The differences between the academics' and professionals' answers were minimal, although it should be noted that academics gave a greater value to cooperative partnerships than the experts' median. In contrast, professionals ranked mergers among cooperatives at the same level as alliances, as opposed to the experts' median where, although the value was the same, there was no acceptable level of consensus, which also happened in the case of professionals.

Table V.
Global and competitive strategies of agricultural cooperatives

	Academics		Professionals		Total experts	
	M	K	M	K	M	K
Global and competitive strategies						
Product differentiation	5	0.75	5	1	5	1
Cooperative alliances	4.5	1	4	1	4	1
Second grade cooperatives	4	0.75	4	1.5	4	0
Export consortia	4	0	4	0.5	4	0
Cooperative groups	4	1	4	0	4	1
Mergers cooperatives	4	1	4	1	4	2
Cost reduction	4	1.75	4	1	4	2

Table VI shows the main functional strategic actions that agricultural cooperatives can implement in dealing with the effects of the agriculture crisis. In this case, the importance of such actions and the real state of affairs is also taken into account.

Experts assess virtually all functional strategies as being highly important for agricultural cooperatives. Having a manager, professional management, training employees, introducing management and cost monitoring systems and quality management are given maximum scores with an acceptable degree of consensus. Applying ICT to the management of the cooperative is ranked at 4 out of 5 and with an acceptable degree of consensus. The results obtained in the second round of the study are exactly the same as in the first. Academics also rate the application of ICT to the management of cooperatives with a 5 out of 5 (as opposed to the experts' median which is 4 out of 5) and instead rate with a 4.5 the use of marketing techniques (which is 5 over 5 according to the experts' median).

Table VI.
Other functional strategies for agricultural cooperatives

	Academics		Professionals		Total experts	
	M	K	M	K	M	K
Importance						
Having a manager	5	0.75	5	0	5	0
Professional management	5	0	5	0	5	0
Training workers	5	0.8	5	1	5	1
The use of marketing	4.5	1	5	1	5	1
Management and cost control	4	1	5	0	5	1
Quality management	5	0.75	5	1	5	1
Applying ICT to management	5	1	4	1.5	4	1
Real situation						
Having a manager	3	1.75	4	1.5	4	1
Professional management	3	1	3	1	3	1
Training workers	3	0	3	0	3	0
The use of marketing	3	1	3	1	3	1
Management and cost control	3	0	3	0.5	3	0
Quality management	3	0.75	4	1	3	1
Applying ICT to management	3	1	3	0.5	3	1

Finally, with regard to the current state of these functional strategies in agricultural cooperatives, it should be noted that having a manager in the cooperative was only considered important by professionals with a score of 4 over 5 (as academics rate it at 3 out of 5); while all the other strategies were given an assessment of 3 out of 5. Professionals also ranked quality management within cooperatives at 4 out of 5.

4. Conclusions

The Delphi analysis performed for this study revealed that Mediterranean agriculture suffers from a severe crisis for which the solutions are hard to find, although the existence of agricultural cooperatives and certain specific forms of performance and financing can partly improve the situation described. The application of the SWOT analysis based on the opinions of the experts provided sufficient detailed insights of the current situation of cooperatives. Thus, from the Delphi SWOT applied to Mediterranean agriculture and agricultural cooperatives, we can make the following assessments.

4.1 Measures versus weaknesses and threats

First, the main weaknesses for Mediterranean agriculture are the dispersion of agricultural supply, small-sized farms, the ageing farm population, the prevalence of part-time work, the difficulties of farm mechanization and modernization and difficulties in the transfer of the business from one generation to another. They are structural weaknesses that are difficult to solve, placing agricultural enterprises in a disadvantageous position, particularly with regard to their clients (commercial distribution companies). In spite of this, some measures can be drawn that can help reduce or even eliminate some of the weaknesses described in our study. Thus, experts point to the need to increase the concentration of land supply, achieving economies of scale and diversifying production, as measures to improve the position of agricultural enterprises in the market. The creation of agricultural cooperatives may contribute to these actions by showing these companies how to develop and improve methods of professionalism, introducing ICT in management, a new quality management system, appropriate training processes and staff qualification. One possible danger that could occur, which and could reduce the competitiveness of cooperatives is that the best land management professionals work for just a handful of agricultural capital firms, while partners with lower levels of expertise join agricultural cooperatives.

In contrast to the aforementioned weaknesses, Mediterranean agriculture also presents a number of strengths that, if well used, can serve to improve competitiveness. The traditional image and rooting in the local land work in favour of agricultural cooperatives. These companies are difficult to change since many of them are centuries old, born from the bottom up, from the needs of farmers who are owners, and these traditions can become barriers to functioning in the bounds of current democratic governance and the prevalence of the interests of their partners over specific personal interests. This strength is the basis for achieving the highest possible concentration of supply, bringing together the marketing of products from small and medium-sized farms to an agricultural cooperative and thus improving their bargaining power on the agricultural prices against distribution chains.

Second, the main threats faced by Mediterranean agriculture are the concentration of the distribution channels, the Common Agricultural Policy, competition from other

countries and the possible disappearance of credit unions. The concentration of the distribution channels is undoubtedly the most important because it results in the lowering of agricultural prices at source, in many cases even below the production costs. The measure proposed by the experts in order to deal with this threat is to join resources in agricultural cooperatives, so that agricultural supply would be pooled and therefore their bargaining power would increase. Cooperation between agricultural cooperatives, participation in cooperative groups and incorporation into second-degree cooperatives are also measures that can contribute to the concentration of supply.

A second type of threat is derived from the agricultural policies pursued by the governments, mainly by the European Union. The EU's CAP or Common Agricultural Policy is characterized by defending the interests of continental agriculture, ignoring those of Mediterranean agriculture or even acting against it in situation such as preferential agreements with third-party countries. Agricultural products from North Africa and South-East Asian countries account for high price competition for products coming from the Central Mediterranean Basin with the approval of the CAP. To address these threats, Mediterranean producers must improve their competitiveness and differentiation through measures such as improved product quality, introducing globalization processes, introducing organic production and achieving the designation of origin.

Finally, the possible disappearance of credit unions (credit sections and rural banks) as a result of the financial system concentration processes may involve the disappearance of a valuable financial instrument for Mediterranean agriculture. In this sense, creating their own credit sections and reaching preferential agreements with credit institutions specialized in financing the agricultural sector – such as rural banks – can be considered appropriate measures to face up to this threat.

When addressing environmental threats, Mediterranean agriculture should exploit the opportunities provided by the environment, as well as introducing the use of ICT to improve the marketing of agricultural products, cooperative management, the development of agricultural producer groups, geographical proximity to major markets, the possibilities of promoting agricultural consumption and the traceability of agricultural products, environmental conditions, the possibility of outsourcing farming and the environmental importance of fruit and vegetables.

4.2 Agricultural cooperative strategies

The SWOT analysis conducted and evaluated in the previous section should be useful for formulating strategies with the aim of improving the competitiveness of Mediterranean agriculture and its farming enterprises, especially cooperatives.

In relation to competitive strategies, agricultural employers must implement differentiation strategies based on product quality and the use of marketing techniques. The implementation of competitive strategies based on reducing costs and even cost leadership are very dangerous and ineffective because it is very difficult to compete on price with products from other countries, who additionally enjoy preferential agreements with the European Union – an institution that does not demand the same standards of quality, safety and hygiene as for products that come from EU countries. The quality strategy should be based on the provision of value-added products, traceability and ecological concerns. Another extremely important aspect is the use of marketing techniques based on promotion and

advertising. The main attractions of this type of products would be: they are ecological, environmentally friendly and come from socially responsible companies. In addition, obtaining and labeling the country of origin would be a very good strategy to promote the high quality of Mediterranean agricultural products.

Nevertheless, the differentiation strategy is compatible with a cost reduction strategy, which, via the concentration of agricultural supply, would make it possible to offer products at affordable costs, taking into account the strong downward pressure of prices exerted by the distribution companies. To achieve these competitive differentiation strategies that are consistent with a reduction in costs, it is also necessary to implement growth strategies based on cooperation. Compared to merger strategies, which eliminate companies in the sector and generate significant social costs (the cost to consumers through the tendency towards oligopolies and cost to employees via the process of restructuring and redundancy), strategic alliances permit the concentration of the agricultural offer but maintain the legal independence of the cooperating companies. The experts who took part in the study showed a preference for cooperation strategies as opposed to mergers, pointing mainly to those alliances that are most appropriate to cooperatives, such as second-degree cooperatives, exportation consortia and cooperative groups. However, there does not seem to be any conclusive preference for such strategies, above all, in light of the statements from industry professionals, because of the fact that agricultural cooperatives had not known how to or had been unable to take advantage of the business cooperation formula, probably due to a lack of in-depth engagement between business partners.

To successfully implement these strategies, it is necessary to also develop functional strategies, primarily for funding. There is a consensus in pointing out that Mediterranean agriculture and cooperative farming suffer from a marked lack of financing. In order to make the necessary investment to improve the quality of agricultural products (differentiation strategy), it is necessary to ensure appropriate funding sources. Traditional funding sources in the agricultural sector are fading through real and virtual mergers (among rural banks and savings banks) so that specialist credit for the farming sector has become less of a priority. This means that agricultural cooperatives should search for new sources of alternative funding from public funds (grants and subsidies from various governments and agencies) and traditional credit institutions. Although there is no unanimity among the experts, the study concludes that credit sections can be a source of adequate funding for agricultural cooperatives and their members, as they are an internal source (which eliminates the transaction costs of the cooperative and the partner) and by having a greater flexibility to suit the specific needs of their customers.

Finally, strategies are also required for the other departments such as human resources, marketing, research and technology and development to facilitate the implementation of global and competitive strategies in agricultural cooperatives, since experts had agreed on the fact that there are no strategic programs related to the areas mentioned previously. The qualification of the staff of the cooperatives by improving their expertise, especially in relation to management, would be a key resource for achieving greater competitiveness. Not only is it necessary to have a manager, but he/she should be qualified. Furthermore, efforts are necessary to introduce marketing techniques and ICT, both at the managerial and commercial levels.

In conclusion, agricultural cooperatives represent an appropriate option to address the crisis situation of Mediterranean agriculture. However it is necessary that they should make a significant effort in improving their management, building on their strengths (traditional image and strong roots in the area) and their opportunities (greater potential for cooperation) to address their weaknesses (scattered agricultural offer) and threats (the stronger bargaining power of the distribution companies).

Note

1. Due to limitations of the work, only the histograms of the most important variables are included in both these figures and in subsequent figures.

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