ASSESSING THE USEFULNESS OF ACCOUNTING INFORMATION AS AN INSTRUMENT TO PREDICT BUSINESS FAILURE IN SPANISH COOPERATIVES [1].

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1. BACKGROUND AND OBJECTIVES.

The proliferation in recent decades of research works that focus on developing models to predict business failure has been the direct result of the social and economic implications associated with such situations, which are exceptional circumstances in the firm's correct operation. Obtaining successive statistical models to allow us to anticipate insolvency situations has been due to the need to adopt suitable corrective measures to avoid financial difficulties and, as a result, to prevent the firm from disappearing.

Despite the large number of contributions made, a theory has not been put forward about business failure or its determining factors, and most works have tested the informative content of financial statements as a prediction element in an attempt to seek a relationship between accounting information and future solvency. Despite the results of each research work being based on the objective data obtained by means of rigorous quantitative procedures, they generally prove insufficient to draw conclusions in an isolated manner on business failure as they tend to be replicated or qualified in the light of subsequent works (Jiménez, 1996).

The most usual methodology employed in these works involves selecting a group of insolvent firms and to match it with another group of solvent firms, which are similar in terms of their dimension and activity sector, by analysing the economic-financial characteristics that distinguish between both groups and by attempting to identify those variables that best contribute to anticipating insolvency situations (Correa, Acosta & González, 2003). This is exactly where we find one of the weak points of such methodologies given that the variables employed tend to be selected based on the bibliography consulted. Therefore, we believe that carrying out an analysis based on the Delphi methodology would be of much interest to determine the variables that the experts consider would offer the best predictive power.

The first empirical works (Beaver, 1966; Altman, 1968) conducted in past decades in this field were univariate analyses. However, they were rapidly replaced with others using a multivariate approach based on a multiple discriminant analysis. Nevertheless,

the validity of the results obtained with this kind of analysis was soon to be questioned given the considerable statistical restrictions that characterised this methodology; this scenario favoured the appearance of a new stream of studies based on conditional likelihood models, among which logit models stood out. The application of the repeated participations technique was to become another interesting research line to predict business insolvency. Finally, the more recent research alternatives that apply artificial intelligence techniques are worthy of mention.

Yet most former studies centred on legal forms of a business nature, and works that predict failure in agricultural cooperatives are practically nonexistent, especially in Spain. Their interest lies in their peculiarities relating to other society forms, particularly in relation to their financial information and the variables to be considered.

Cooperatives in general, and agricultural cooperatives in particular, are legal forms which differ from trading corporations and present fundamental characteristics that derive, among others, from them having their own legal regulations. These cooperatives enjoy long-standing tradition and have demonstrated a tremendous capacity to generate well-being and wealth for their members despite varying political, economic and social circumstances. Thus, this results in cooperatives often being not only the main driving force of the economic and social life in many territories, but also the main business instrument for their inhabitants.

Subsequently, the main elements of this legal form seem to justify a priori the development of specific prediction models, and the need to previously determine the business failure concept to be applied to agricultural cooperatives and, consequently, the independent variables that can explain it.

This work aims to analyse the usefulness of accounting information in agricultural cooperatives to determine which accounting variables can be taken as independent variables from the business failure concept that enable the business failure prediction models reported in the bibliography to be applied to agricultural cooperatives.

Specifically, this work will analyse the failure concept and the variables to be used, among other matters, by considering specific agricultural cooperatives' characteristics.

2. METHODOLOGY.

The methodology used to develop this work has two parts: firstly, a literature review was done; secondly the Delphi method was applied, which enabled systematic and ordered consultations to be made by a panel of experts in the matter.

The aim of performing an in-depth literature review was to know the prediction models developed to date by the scientific community and to assess them in relation to their possible application in cooperatives. This initial methodological phase evidenced that there are many business failure prediction models which have been mainly applied to industrial-type firms.

Given their characteristics, the models that could be applied to a cooperative were examined in more detail by carefully analysing those that have been specifically designed for this type of entity (Dietrich, Arcelus & Srinivasan, 2005) and by focusing on the variables used. This work is applied specifically to agricultural cooperatives in Canada, so it will be a good starting point. We have not found any other paper related with it in the bibliography review.

Next the problems relating to the classic paradigm were assessed, which involved having to choose one method or another. In other words, it was necessary to select the business failure criterion to be used and, consequently, the variables that enabled the classification or discrimination of the initial sample of firms into two groups: “healthy” cooperatives and “failed” cooperatives.

Hence to specify an objective failure criterion and to identify its most representative variables, we resorted to a methodology that consults experts, specifically the Delphi analysis which, through successive consultation sessions and their subsequent statistical analysis, would allow us to obtain responses from acknowledged experts in the matter, and the aspects and variables which may contribute to more reliably predict failure in a cooperative.

2.1. Qualitative research: the Delphi analysis.

Qualitative research intends to offer information about the nature, quality and motivations of human conduct. Logically, its use prevails when the information to be acquired is of a qualitative kind; that is, when the facts are not directly observable.

Qualitative methods use techniques to obtain unstructured, flexible information, and of a psychological and/or sociological kind. As a result, the aim of this research is of an exploratory type. Its techniques work with small-sized samples with which abundant

knowledge is acquired. Obviously, their results are neither quantifiable nor can be extrapolated to the general population. However, their usefulness lies in their power to describe facts and to explain their motivations with data.

Nevertheless, the social research measurement is more complex than in natural sciences as there are serious problems of inaccuracy and variations in measurements prove more unpredictable with human subjects.

The Delphi method was created by The Rand Corporation, a North American consultation firm, at the end of the 1940's, although it developed in the 1960's and the 1970's. Linstone and Turoff (1975) defined it as a "method for structuring a group communication process which is efficient when it comes to allowing a group of individuals to deal with a complex problem as a whole". This technique is a systematic and iterative method used to collect the opinions of a group of experts, and it can be employed with two basic objectives in mind (Dalkey & Rourke, 1971):

- Predictive purposes: the method used as a prediction technique under uncertainty conditions for future scenarios (Fildes, Jallan & Wood, 1978).
- Obtaining an opinion on a specific theme for which no previous information is available. This application is particularly relevant when historical data are lacking (Gupta & Clarke, 1996).

On the other hand, the distinctive characteristics of this subjective group technique are:

- Participants maintain their anonymity during the process (to avoid thinking at a group level).
- Participants' feedback is controlled, which permits noise to be freely transmitted (without irrelevant, redundant and mistaken information).
- There is a statistical group response (for which all the individual opinions are considered in the group's final result).

The Delphi Technique aims to obtain a reliable group opinion from a group of experts (Landeta, 1999). Analysing the experts' estimations basically consists in aggregation to obtain a central tendency distribution measurement (normally the median), which is taken as the statistical response. The interquartile range is also established as a dispersion measurement of the estimations.

3. DETERMINING BUSINESS FAILURE FACTORS: THE CLASSIC PARADIGM AND ADAPTING IT TO AGRICULTURAL COOPERATIVES

The literature review revealed a series of problems that may determine the business failure prediction model and which the authors describe to be the “classic paradigm” (Balcaen & Ooghe, 2006). Basically, these are as follows:

- The failure concept
- Selection of variables and the relationship among unstable data over time
- Selection and characteristics of the sample of firms

3.1 The business failure concept.

As indicated previously, one of the main problems to arise when applying models to predict business insolvency is to determine the concept of insolvency, bankruptcy or business failure as this will establish the composition of the samples of firms to be used in the analysis given their inclusion in the “failure” or the “non-failure” group.

The literature review did not enable us to clearly define the concept that the various authors used. However, we found that there are two forms of defining this situation: from the legal viewpoint and from the economical viewpoint; the former predominates in the majority of the studies reviewed. In some cases, we also found hybrid situations where certain legal and economic aspects are combined to define the failure point.

Along these lines, the prevalence of the legal viewpoint is due to the usage of an objective criterion which allows firms to be easily separated into the two aforementioned groups (healthy or insolvent). In contrast, the economic criterion introduces arbitrariness to the definition as a wide range of variables may be used (losses in several consecutive accounting years, suspension of dividend payments, low cover rate of financial burden, negative EBITDA, restructuring processes for organisation purposes, etc.) without ever clarifying if any are more important than others (Balcaen & Ooghe, 2006).

Finally, the two viewpoints are combined in some cases. This is the case of those firms that are unable to settle accounts, and enter a bankruptcy process or reach an agreement to reduce debts (Blum, 1974).

The business failure study performed in agricultural cooperatives in Canada (Dietrich et al., 2005) had the advantage that the legal definition of business failure began with some clearly determinable objective budgets, namely:

- the cooperative had not presented its financial statements in the corresponding Register in the last three years.
- the cooperative had applied for voluntary winding-up.
- the cooperative had been wound-up in Court.

All in all, the fulfilment of these circumstances will imply including the cooperative in the corresponding Register as an insolvent cooperative. In our particular case, we have resorted to the Delphi methodology to determine this concept for cooperatives.

The bibliography shows that a firm which finds itself in a bankruptcy situation when all its obligations exceed its total assets is valid; that is, when its net equity is negative.

It should be pointed out that this situation should not be legally possible given Article 363 of Royal Decree 1/2010, of 2nd July, with which the text included in the law on Spanish Corporations is approved, which indicates that the society should be wound-up “given the loss which reduces its equity to an amount that is below half the corporate capital, unless this sufficiently increases or decreases, and provided that a declaration of bankruptcy does not apply”. Nonetheless, the situation is expected to prolong over two consecutive years to allow a negative equity situation during the first of the two years. However with cooperatives, nothing is regulated in terms of their fundamental state regulations; thus, this situation could indeed take place. Conversely, this situation is regulated in accordance with the laws on cooperatives in the Spanish Autonomous Communities of Madrid and Castilla-La Mancha.

Moreover, the aforementioned literature review suggests that this last criterion also appears to have been applied.

Therefore by considering all this information, determining the criterion to identify “failed” cooperatives seems necessary for cooperatives. Therefore, the first part of the Delphi study centres on this matter.

3.2. Variables in the model.

A second matter to be determined when constructing a business failure prediction model is to choose the data or variables to feed it.

Choice of variables is directly influenced by the business failure criterion applied. In relation to this, the scientific community has reached a relative consensus in terms of how relevant the accounting information may be, especially in those models in which an economic aspect of the failure concept has been used (technical bankruptcy).

Nonetheless, some authors criticise this approach which is restricted to the financial concept of failure, and which may ignore its true dimensions. In fact not all the relevant information about the situation the firm finds itself in is reflected in its accounting statements.

Most of the models published by the academic literature are constructed and based on various statistical techniques, and on the financial data of a sample of healthy firms and on another sample of firms with problems for the purpose of predicting failure in a short-term time horizon, normally from one to three years before (Cybinski, 2001). Yet there seems to be no consensus relating to the definition of either explanatory variables or the most predictive models.

In general terms, most of the variables that initially feed predictive models are arbitrarily chosen based on either those criteria that are popular in the literature or their predictive capacity, as previous studies demonstrate. Subsequently with this initial battery, a group of variables is selected using statistical criteria (significance, individual discriminating capacity, the result of classifying a combination of them, among others), or other empirical considerations, basically due to there not being a business failure theory that demonstrates which variables offer better prediction power (Scott, 1981).

This procedure has serious drawbacks despite it being the most widely used. Balcaen and Ooghe (2006) encountered significant evidence that choice of variables is conditioned and specific for the sample upon which an empirical study is being conducted, and that the resulting predictive model seems to be specific for this sample and cannot, therefore, be generalised. What is more, and given this empirical choice of variables, the resulting model may occasionally show unexpected signs in certain coefficients caused by a strong correlation between individual ratios. For this reason, some researchers have opted for other theoretical frameworks to help guide the selection of variables, most of which are based on the cash-flow theory.

The extended use of accounting information in the form of financial ratios to predict business failure has been traditionally based on the objective and public (accessible) nature of this information. However, a first limitation of its use involves having to periodically prepare and publish this information which, in many countries (e.g., UK, Germany or USA), is restricted to criteria such as the size or type of the firm. Hence in many cases, prediction models have been developed for large firms.

This aspect cannot be applied exactly to the case of Spain where laws on commerce and accounting standards establish that it is compulsory for all firms to prepare and

present their yearly accounts, with no exceptions of any kind. Nevertheless in practice, it is of particular importance that, for the legal form of firms we are looking at, cooperative societies in certain sectors may have "neglected" their accounting obligations as a result of their small size. Besides, cooperative societies have their own Public Cooperative Registers, which are independent of the Register of Businesses. This situation, in principle, should facilitate public access to these entities' specific accounting information.

Moreover, the underlying hypothesis in the use of financial ratios to predict failure is that accountancy provides a truthful and reliable image of the firm's financial situation. Yet it is reasonable to believe that firms with an unhealthy financial situation can employ creative accounting practices to (at least) manipulate their outcome and to present a more positive financial situation, particularly in situations that come close to failure. Some authors also suggest that certain firms offer poorly reliable accounting information because they do not have an internal control system (Keasey & Watson, 1987), or that some firms make adjustments given a declaration of bankruptcy (Charitou & Lambertides, 2003). In light of all this, the business failure models based on financial ratios may prove distorted and their practical use may be limited. Nonetheless, this limitation is easily avoided if work is done with audited financial information by selecting a population of firms with favourable auditing reports.

Other problems that may arise from using financial information include the possibility of there being either extreme or abnormal ratio values or lack of yearly accounts in firms undergoing a bankruptcy process.

Most certainly, use of another kind of variables that are not exclusively financial may offer a broader perspective of business failure situations, thus conferring the predictive model greater reliability. Yet in practice, it is necessary to consider the benefit-cost binomial, especially during this initial approach to prepare a model of an exploratory nature.

Basically, although accounting information has its limitations, we understand that it is currently the most accessible informative source in relation to the cooperative societies with which we are working, whereas variables will enable us to identify and discriminate between healthy and insolvent societies more objectively.

3.3. Seasonality and instability of data over time.

Using a statistical model with a predictive capacity means that the relationships among variables have to be stable over time. In this way, any distributions of the variables in the model will not change in time; in other words, they will display “seasonality”. This implies a stable relationship between the dependent variable and the independent variables in the model over time.

Nonetheless, evidence abounds in business failure prediction models that independent variables do not display a stable relationship over time with the dependent variable (Barnes, 1982; Richardson & Davidson, 1984; Zmijewski, 1984; Mora, 1994). Consequently, the model’s explanatory capacity will diminish substantially the further the time horizon is from when insolvency takes place (Correa et al, 2003).

Dambolena and Khoury (1980) maintained that variability in financial ratios is a variable that is as important as its own value, and they concluded that a model which includes deviations of ratios will have a slightly greater predictive capacity. Conversely, Keasey and Watson (1991) indicated that variability measures always incorporate information from several years; therefore, the predictive improvement of the models which included the stability of ratios as an independent variable could be due more to the fact that they included information from several years than to not having included stability itself.

Furthermore, other studies (Correa et al, 2003) have demonstrated that static indicators offer a greater explanatory capacity than those of a dynamic nature the nearer the time insolvency takes place. In this way, the ratios relating to patrimonial warranties will have a greater predictive power than those capable of refunding debts at times immediately prior to the firm’s insolvency.

Another of the essential criticisms made about the use of such predictive models refers to unstable data over time. This situation may be due to several factors; for instance, the firm’s activity cycle phases, variations in inflation and interest rates (Mensah, 1984), or the result of changes taking place in the market, in technology or in the firm’s strategy (Wood & Piesse, 1987).

Lack of seasonality and instability of data has grave consequences for models that predict business failure (Balcaen & Ooghe, 2006), firstly because their predictive capacities will be poor when applied to future potential samples, and secondly because the robustness of the model will not suffice when the data being used are unstable. Consequently, the results of predictive models could undergo time distortions and their estimations could prove inconsistent. Easing such problems involves updating and

redefining the predictive models in each case they are applied to. For this very purpose, some researchers have used stable measures, sectorial ratios or deflated financial ratios (Dambolena & Khoury, 1980; Platt & Platt, 1990; Mensah, 1983); however, they have not managed to significantly enhance the quality of predictions.

4. ASSESSING THE USEFULNESS OF ACCOUNTING INFORMATION IN AGRICULTURAL COOPERATIVES FOR ITS USE IN MODELS THAT PREDICT BUSINESS FAILURE: THE DELPHI ANALYSIS.

Due to there are hardly any studies of business failure in the field of agricultural cooperatives, the application of the Delphi methodology is useful in an exploratory study. For these studies, most researchers of social research methodologies recommend the use of qualitative methods (Corbetta, 2003, Sanchez et al, 1999).

The Delphi method developed in this work has counted on the opinions of 40 experts from various academic, professional (basically auditors and trustees in bankruptcy) and institutional (federations of cooperatives) domains.

The method chosen to facilitate the various questionnaires to the participating experts was electronic mail. This tool is very useful for this kind of studies as it facilitates the completion of questionnaires, and speeds up the process of sending and receiving information.

The questionnaire included a first section of questions from which it was intended to analyze the situation and future prospects of the agricultural cooperative sector in reference to business failure. The second part included questions which helped identify whether a agricultural cooperative was a “failure” and the causes to apply for, or not, insolvency proceedings. The last section asked about a series of financial variables, specifically the predictive use to estimate the likelihood of a agricultural cooperative becoming a “failure” in the mid and long term.

4.1. Making up the group of experts

The panel basically included three expert profiles: auditors and trustees in bankruptcy, academics specialised in the study areas involved, and technicians specialised in business organisation who offer their services in the sector. Several consultants who provide counselling to the various cooperatives were also invited. The questionnaires were initially sent to a total of 125 experts, who were prioritised according to numbers

of auditors, consultants and trustees of bankruptcy given their foreseeable lower response rate.

At all times, a certain geographical balance was sought by inviting experts with the aforementioned profiles from all Spanish Autonomous Communities.

Related with the type of the experts consulted, we must indicate that all the panellists belonged to the "experts" category, which did not include "facilitators" or "stakeholders". These type of participants were not necessaries in this case.

Finally, 40 experts participated in the first round, of whom 30 continued in the second round. This number is not only statistically significant, but also minimises errors in the qualitative study since a higher participation rate would barely diminish errors (as pointed out by Landeta, 1999). It is also noteworthy that 21% of the participating experts had taken part in some bankruptcy proceedings in cooperatives (mainly cooperative work associations and agricultural cooperatives).

4.2. Analysis of the results.

Firstly, the analysis of the results was done to determine the number of valid responses to each question. Thus, the 40 experts participating in this study answered all or most of the questionnaire.

Secondly, the median (m) was determined for each study question as the central measure of the groups of experts' response tendency; that is, the median is the group's response in this study. The interquartile range (k) was also calculated to measure sample dispersion, and is inversely proportional to the group consensus (e.g., the greater the range, the lesser the consensus). Complementary indicators were also determined: arithmetic mean (μ), mode (Md) and standard deviation (σ). These values will be particularly useful for the questions which will determine the relative order among the items with the same median.

In the first round, the stability criterion was equal to the consensus criterion; that is, the result will be stable if a consensus exists. In the second round, however, the stability criterion was independent of the consensus. Group response stability is understood as not being likely to change in the short term (regardless of there being a consensus or not). To assess it, the relative interquartile range (r) variation of each response will be used. The relative interquartile range is the interquartile range divided by the median and its variation (Vr), which will equal the difference between the relative interquartile ranges of the two successive rounds (Vr = rj – ri). Group response stability will be

considered to have been achieved (and, therefore, it is not likely to change in successive rounds) when the relative interquartile range variation is between -0.25 and 0.25. Irrespectively of there being a consensus or not, the response will be considered stable.

4.3. Segmentation of the group of experts' opinions.

Many segmentations have been performed in this study to identify the typical traits of the different profiles within the panel (age, gender, professional sector, territory and participation of experts in bankruptcy proceedings in cooperatives). In this way, information is obtained which would otherwise be diluted in the general aggregate (when different opinions are compensated).

Most of the segmentations performed found no significant differences in relation to the group's statistical response. The main significant difference from the territorial viewpoint encountered by performing segmentations was that Valencian experts give more importance to the "financial structure" variables as predictors of business failure in cooperatives than to the "solvency and liquidity" variables.

4.4. Weighting the group of experts' opinions.

The data obtained were also processed by weighting them in terms of the experts' knowledge on the "economic-financial management in cooperatives" field.

This weighting process was based on the experts self-assessing the knowledge during the first study round. As suggested by Landeta (1999), empirical evidence has demonstrated that self-assessment does no present significant differences if compared with other assessment types.

The two operations done in this study did not provide new results which conclusively differed from the group's statistical response.

5. THE DELPHI ANALYSIS RESULTS

5.1. Business failure in agricultural cooperatives: analysis

In the first round of the study, we asked the experts to identify agricultural cooperatives' main weaknesses and strengths that relate to business failure. As statistical processing was not possible, the analysis of the results shows the findings.

Table 1: Internal weaknesses of agricultural cooperatives in relation to business failure.

Order	AGRICULTURAL COOPERATIVES' INTERNAL WEAKNESSES IN RELATION TO BUSINESS FAILURE.	M	μ
1	Worker training	8.0	7.6
2	Lower capitalization due to members voluntarily leaving.	8.0	7.1
3	Small business size	7.0	6.7
4	Internationalization of activity	6.0	6.3
5	No possibility of checking the ROE as their system usually pays shopping members	6.0	5.6
6	Democratic management	5.0	5.1
7	Default registration obligations	2.0	2.8
8	Distinction between returns according to the origin of the activity		
9	Lack of training and information to distinguish between cooperative activities and social purposes		
10	Confusion between cooperative activity with no members and social purposes		
11	Lack of explicit recognition of its characterization as a trading company		
12	Member's responsibility for social debts		
13	Member's obligation to cover economic losses		
14	Problem of short-term / long-term vision as a creditor or as a member		

Source: the authors' own.

As we can see, experts suggest that workers training and lower capitalization due to members voluntarily leaving are the main weaknesses that relate to business failure. Small business size was of less significance. Finally, note how default registration obligations are not considered important to identify failure in agricultural cooperatives. The experts identified additional weaknesses such as confusion between social purposes and cooperative activity, distinction between responsibilities and returns, or members' long-term vision.

Table 2: Agricultural cooperatives' internal strengths in relation to business failure.

Order	AGRICULTURAL COOPERATIVES' INTERNAL STRENGTHS IN RELATION TO BUSINESS FAILURE.	M	μ
1	Sense of belonging/ Member loyalty.	7.0	7.00
2	Member-creditor coincidence.	6.0	5.93
3	Democratic management.	6.0	4.90
4	Intercooperation.		

Source: the authors' own.

On the other hand and regarding the sector's strengths, experts highlight the members' positive sense of belonging. Both coincidence between member and creditor, and democratic management, are less prominent strengths.

Table 3: Agricultural cooperatives' external threats in relation to business failure.

Order	AGRICULTURAL COOPERATIVES' EXTERNAL THREATS IN RELATION TO BUSINESS FAILURE	M	μ
1	Economic crisis	8.0	8.1
2	Public policies addressing agricultural cooperatives.	6.5	6.0
3	No possibility of refunding obligatory funds in general	5.0	5.0
4	Members' "infidelity".		
5	Waiting for subsidies as a financial mechanism		
6	Existence of 15 different laws depending on Spanish Autonomous Regions		
7	Few training advisors from agricultural cooperative associations		
8	Lawyers, auditors, etc., do not know cooperatives		
9	Adapting the General Accounting Principles to cooperatives		
10	Structural Modifications of Business Law do not apply to cooperatives		
11	Competence		

Source: the authors' own.

External analyses identify the main threat as the economic crisis. According to the experts, other aspects such as public policies addressing agricultural cooperatives, or no possibility of refunding obligatory funds, are less important. Experts also mention other threats such as the legal framework (legislation in Spanish Autonomous Regions, new accounting and social legislation, and so on), or few training advisors from agricultural cooperative associations.

Table 4: Agricultural cooperatives' external opportunities in relation to business failure.

	AGRICULTURAL COOPERATIVES' EXTERNAL OPPORTUNITIES IN RELATION TO BUSINESS FAILURE	M	μ
	Innovation.	8.0	7.60
	Training.	7.5	7.53
	Internationalization of activities.	7.0	6.83
	Public Policies	6.0	5.93

Source: the authors' own.

To conclude the analysis, Table 4 presents agricultural cooperatives' main external opportunities in relation to business failure. Innovation and training are the most important opportunities. Internationalization is also important, but at a second level. Once again, public policies are the least important opportunities according to the experts. After bearing in mind this analysis, we consulted the experts about the solutions to correct the weakness detected. Table 5 provides the main contributions grouped in accordance with the line of action.

Table 5: Measures to correct weaknesses.

	MEASURES TO CORRECT WEAKNESSES	
1	*Improve professional management*: search for greater efficiency, members' training to perform these activities or training with external professionals	13
2	*Intercooperation, cooperative integration, in an attempt to grow, especially to generate economies of scale or to do internationalization processes, etc.*	10
3	*Training for workers and directors, especially in terms of accounting, and of economic and financial aspects.*	9
4	*To improve business capitalization:* alternative financing when members leave, use a maximum period to pay back members' shares; forbid members leaving without sufficient notice; minimum commitment time; make members' shares not refundable, etc.	6
5	*Improve the business organization*: strengthen the functional organization and government, a weighted plurality vote when democratic decision-making is slow, prevention of assembly-management.	4
6	*Greater degree of involvement and members' satisfaction*: especially to discourage members leaving the cooperative.	3
7	*Improve member's remunerations:* more efficient systems to calculate surplus, and to define dividends via benefit distributions and not as payments of members' supplies, etc.	2
8	*Promote innovation.*	2
9	*Internationalization of business activity.*	2

Source: the authors' own.

After considering all the proposed measures, we highlight those designed to enhance cooperatives' professional management, to increase intercooperation and integration (seeking a greater dimension), and to improve training for workers, managers and members in terms of decision-making. There seems to be heightened awareness of the beneficial effects that could result in achieving results along these work lines

5.2. Business failure in agricultural cooperatives: concept and application.

As we mentioned before, another part of the questionnaire consulted the experts about the circumstances that evidence business failure. Table 6 presents the degree of relevance of the circumstances analysed.

Table 6: Business failure descriptors in cooperatives.

Order	BUSINESS FAILURE DESCRIPTORS IN COOPERATIVES	M	μ

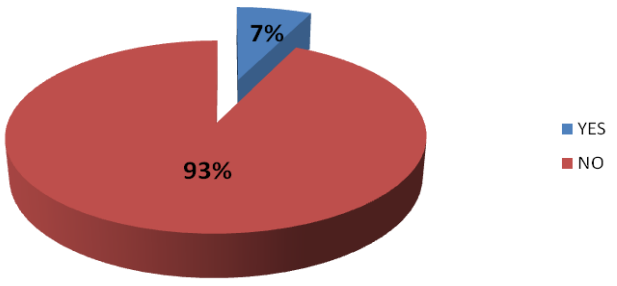
1	Liquidation	9.5	9.1
2	Bankruptcy proceedings	8.5	8.1
3	No cash flow and unable to make payments	8.0	8.2
4	Negative equity	8.0	8.1
5	Intervention by the administration	8.0	7.7
6	Losses in several accounting years	8.0	7.5
7	A significant number of members has left	7.0	7.1
8	Equity < 50) of social capital	7.0	7.1
9	Restructuring the business	6.0	5.9
10	No sharing of rebates	5.0	4.3
11	Annual accounts have not been presented	3.0	3.5
12	Payment made to members at prices which differ negatively from market prices.		

Source: the authors' own.

According to this analysis, the legal circumstances (liquidation and bankruptcy proceedings) are those which clearly evidence business failure in cooperatives, followed secondly by other situations, e.g.: lack of cash flow, negative (or reduced) equity, intervention by the administration or losses in several accounting years. Conversely, situations such as not presenting annual accounts, no sharing of rebates or restructuring the business do not come over as circumstances that identify business failure.

In line with this, experts were questioned about whether cooperatives applied for bankruptcy proceedings if they were failed cooperatives. The experts' response was almost unanimous (see Figure 1) when giving their opinion that this situation barely took place in the cooperative sector.

Figure 1: Application for bankruptcy proceedings in failed cooperatives.



Source: the authors' own.

This analysis identified the causes which justify that most cooperatives do not resort to bankruptcy proceedings, as shown in Table 7 (in order of importance).

Table 7: Reasons why cooperatives do not apply for bankruptcy proceedings.

Order	REASONS WHY COOPERATIVES DO NOT APPLY FOR BANKRUPTCY PROCEEDINGS	M	μ
1	Termination of business activity (with no winding-up)	8.0	8.15
2	The cooperative was previously settled.	8.0	7.67
3	Members leave.	7.0	7.04
4	Winding-up and constitution of a new registered corporation.	6.0	5.56
5	Take-over merger.	5.0	4.44
6	Winding-up and constitution of a new cooperative.	5.0	4.41

Source: the authors' own.

As noted, the commonest causes are that failed cooperatives usually terminate their business activity without winding-up or they have been previously settled. The second most important cause is that cooperatives do not resort to bankruptcy proceedings as a significant number of members has left.

Moreover, Table 8 provides some of the reasons which drove a few cooperatives to use bankruptcy proceedings (in order of importance):

Table 8: Reasons why cooperative apply for bankruptcy proceedings.

Order	REASONS WHY COOPERATIVES APPLY FOR BANKRUPTCY PROCEEDINGS	M	μ
1	To settle the firm.	8.0	7.3
2	Restructuring the cooperative to help it survive.	7.5	7.2
3	Possibility of formal dismissal proceedings.	7.0	6.8
4	No cash flow or unable to make payments /unable to fulfil expected obligations.		
5	Losses in several accounting years.		

Source: the authors' own.

The results obtained clearly demonstrate how settling a cooperative (to help it survive) and restructuring the firm are the two main reasons why a cooperative applies for bankruptcy proceedings.

5.3. Determining accounting variables with predictive capacity.

The purpose of the Delphi analysis is to identify the variables that can predict business failure in cooperatives. A wide range of financial variables has been analysed, basically those relating to the economic and financial structure, solvency, cash flow, added value, productivity and growth.

Table 9 shows the results obtained in terms of the financial variables' relevance in relation to the economic structure and in accordance with the panel of experts.

Table 9: Relevance of the economic structure to predict business failure.

Order	RELEVANCE OF THE ECONOMIC STRUCTURE VARIABLES TO PREDICT BUSINESS FAILURE IN COOPERATIVES	M	μ
1	Relevance of debtors.	7.0	6.57
2	Relevance of stocks.	5.0	5.00
3	Relevance of cash.	5.0	4.77
4	Relevance of fixed assets	5.0	4.73
5	Relevance of current assets	4.5	4.53

Source: the authors' own.

This table identifies a low general assessment of these variables, and relevance of debtors positively stands out as a predictor. On the negative side, the experts consider that the relevance of current assets is a variable with a low predictive value in the cooperative sector.

Table 10: Relevance of the financial structure to predict business failure.

Order	RELEVANCE OF THE FINANCIAL STRUCTURE VARIABLES TO PREDICT BUSINESS FAILURE IN COOPERATIVES	M	μ
1	Indebtness	8.0	7.83
2	Short-term indebtness	8.0	7.47
3	Permanent financing	7.0	6.70
4	Importance of reserves	7.0	6.10

Source: the authors' own.

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In general, financial structure variables prove more important than economical ones (Table 10), and volume of indebtedness and volume of short-term indebtedness stand out as the main predictive power indicators. The remaining study variables (reserves, etc.) are also relevant, but take second place.

Table 11: Relevance of solvency and liquidity to predict business failure.

Order	RELEVANCE OF THE SOLVENCY AND LIQUIDITY VARIABLES TO PREDICT BUSINESS FAILURE IN COOPERATIVES	M	μ
1	Generated self-financing	7.5	7.10
2	Cash Flow	7.0	7.27
3	Liquidity	7.0	7.20
4	Acid test	7.0	7.00
5	Cost of the debt	7.0	7.00
6	Warranty	7.0	6.70
7	Availability	7.0	6.60
8	Covering financial expenses	6.5	6.30

Source: the authors' own.

Liquidity variables (Table 11) are highly valued as failure likelihood indicators, especially generated self-financing. Generation of cash flow and general liquidity in a cooperative are also thought important. Solvency variables do not display that much predictive capacity in cooperatives. Likewise, covering financial expenses is considered a poorly valued variable.

Table 12: Relevance of added value and productivity to predict business failure.

Order	RELEVANCE OF ADDED VALUE AND PRODUCTIVITY VARIABLES TO PREDICT BUSINESS FAILURE IN COOPERATIVES	M	μ
1	Productivity of personnel	7.0	6.90
2	Personnel expenses over Added Value	7.0	6.70
3	Importance of Added Value	7.0	6.60
4	Rotation	6.0	6.40
5	Financial Expenses over Added Value	6.0	6.20

Source: the authors' own.

Added value and productivity variables (Table 12) in relation to the assigned predictive power fall in the centre. Productivity of personnel, personal expenses over added value and importance of added value positively stand out. Conversely, rotation and financial expenses over added value prove poorly relevant to predict failure.

Table 13: Relevance of growth to predict business failure.

Order	RELEVANCE OF GROWTH VARIABLES TO PREDICT BUSINESS FAILURE IN COOPERATIVES	M	μ
1	Growth in Exploitation Income	7.0	6.70

2	Growth in Net Income	7.0	6.10
3	Growth in Assets	6.0	5.70
4	Growth in Fixed Assets	6.0	5.30

Source: the authors' own.

Finally, the analysis studied the predictive power of the financial growth variables (Table 13). Overall, they obtained a mean assessment, and the importance of growth in exploitation expenses and net income stands out. On the other hand, growth of fixed assets is the variable with the least capacity in this group.

6. CONCLUSIONS.

After performing a literature review, we are able to conclude that, despite the abundance of statistical models developed to anticipate the failure of a business, they all involve one problem: the majority of variables feeding these predictive models are arbitrarily selected, or are based on criteria such as their popular use in the literature or their predictive capacity as demonstrated in previous studies. So it is necessary to establish which variables have a more useful prediction capacity, and exactly which ones they are in the case of cooperatives. Thus basing ourselves on the literature and assuming the limitations of accounting information, we understand that informative information is currently the most accessible informative source in relation to cooperative societies and that variables will enable us to identify and discriminate healthy societies from insolvent ones more objectively.

By means of the Delphi analysis, we have attempted to determine the failed cooperative concept. The legal approach has been traditionally employed as an objective criterion to identify failed firms. However, this criterion does not appear to be useful for cooperatives because most failed firms do not enter a bankruptcy process as their activity terminated previously. Along these lines, the literature review seems to show that it is more convenient to employ criteria like negative equity. Thus the Delphi analysis done intends to clarify the economic business failure approach.

The experts participating in this study identified from the legal criteria (settlement and bankruptcy proceedings) those which clearly evidenced business failure in cooperatives by considering economic criteria such as negative equity, or lack of cash flow in second place.

These considerations prove paradoxical for bankruptcy proceedings as the response obtained in the analysis was almost unanimous since this situation scarcely took place in the cooperative sector. In other words, it is a theoretical descriptor that is barely applied in practice. The fact that the cooperative terminated its activity previously (without winding up) or that a significant number of members has left are the commonest reasons why very few cooperatives resort to bankruptcy. Nevertheless in the few cases there are, bankruptcy is caused by the business undergoing restructuring or because of its settlement.

Another of the fundamental objectives of this study is the identification of the financial variables with the power to predict business failure. In general terms, economic structure variables are poorly assessed and relevance of debtors is noteworthy (be it modestly).

Financial structure variables offer greater predictive capacity, particularly volume of indebtedness. This interpretation coincides with former studies done on insolvency in registered corporations.

The liquidity and solvency variables analysed also prove most relevant, particularly the liquidity ones (self-financing, cash flow, etc.). Solvency indicators, such as warranty, cost of debt or covering financial expenses, do not stand out so much in cooperatives and is not in agreement with the literature, which stresses the solvency indicators based on asset-based warranties.

The added value and productivity variables are not stressed positively or negatively; indeed, only productivity of personnel or importance of added value is highlighted. The same can be said of the growth indicators where variables such as growth in exploitation income and net income are noteworthy.

Therefore, and by way of conclusion, the most relevant economic-financial variables to determine if cooperatives come close to the “failed” cooperative concept are volume of debt, liquidity and solvency.

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