Capital structure and financing decisions of agricultural cooperatives: Spanish evidence

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Abstract

The study of the financial structure is a complex and recurrent line of research in the field of corporate finance. Increasing the understanding of the financial structure and its implications on corporate governance is the starting point for improving the access to external financing and reduce transaction costs as to optimize internal funding policies.

There is no universal theory of financial structure although partial theories have arisen from empirical studies, attempting to relate structure with different variables. However, at the micro level, the impact of different types of funding could vary according to the economic situation or the type of company.

While financial theory has traditionally been based on using internal indicators of the companies as explanatory variables of their financial structure, the empirical evidence reveals that this structure varies over time as a result of macroeconomic conditions of the environment in which they are immersed.

This paper provides empirical evidence on the financial structure of cooperatives in Spain and its possible relationship with different variables through a regression model, particularizing the study to agricultural cooperatives.

The use of accounting data in different time horizons eases the analysis of the effect of macroeconomic conditions and financial constraints on the determinants of the capital structure of these entities.

Key words: agricultural cooperatives; capital structure; debt; macroeconomic conditions; regression

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1. Introduction

The study of the financial structure is from the work of Modigliani and Miller (1958), a complex and recurrent line of research in the field of corporate finance. Despite the existence of different points of view on the relationship between the financial system and economic growth (Levine, 2005), theoretical arguments and empirical applications show a strong positive relationship. At the micro level, the impact of different types of financing may however vary according to the economic situation or type of company.

To increase knowledge about corporate financial structure and its implications on corporate governance is the starting point for improving the access to external financing and reduce transaction costs, optimizing the internal financial policies of these entities. There is no universal theory about the financial structure in the firm (Jensen, 1986; Harris and Raviv, 1990; Myers, 2001), although partial theories have been made following empirical studies attempting to relate the structure with different variables, such as firm size or sector of activity (Chittenden et al., 1996; De Angelo and Masulis, 1980; Hall et al., 2004).

Other theoretical papers have focused on the determination of the variables that characterize the capital structure and financial performance of firms (Brav, 2009), or the justification of connections, positive or negative, between the form of funding and the efficiency of the business or its financial results (Nasr, 1998; Alarcón, 2008).

While financial theory has traditionally been based on using internal variables of the companies themselves as explanatory or determinants of their financial structure, the fact is that the empirical evidence reveals that this structure varies over time as a result of macroeconomic conditions of the environment in which they are immersed (Azofra y Rodríguez, 2012). In order to analyze the effect of macroeconomic conditions in determining the capital structure, recent papers have developed models that support the existence of a relationship between corporate leverage and such economic conditions (Hackbart et al., 2006; Levy and Hennessy, 2007).

Internationally, published empirical studies have focused mostly on large listed companies, probably because the higher information requirements for these companies facilitate researcher's access to financial information. However, checking the implications of theories of capital structure and its relevance in unlisted companies not only provides additional evidence but it may also contribute to broaden the perspective on financial decisions in business types operating in different financial environments.

In this line of research, the objective of this study is to provide empirical evidence on the financial structure and its possible relationship with different variables in the case of the agricultural cooperatives in Spain, which are representative entities and one of the largest exponents of the social economy in our country. The empirical study is based on the results of a previous paper (Lajara y Mateos, 2012) in which the determinants of the financial structure of such entities are analyzed. In this case the point of view is dynamic, aiming to characterize the pattern of behavior over a time horizon that is able to contemplate the possible effects of macroeconomic conditions and financial constraints on the determinants of the capital structure of these entities.

To this end, it is used the accounting information disclosed by these entities through a database, in order to characterize its financial structure in different years, to determine the factors that, in each period, affect to their capital structure and draw conclusions that might help to facilitate the adoption of financial decisions in a more efficient way in this type of companies.

2. Theoretical framework: Research hypotheses

While it has not succeeded in formulating a universal theory concerning the financial structure in business, scientific research has advanced knowledge of various factors that empirically have been recognized as of some importance in explaining the funding decisions. On the one hand, it is possible to identify reasons underlying the connection between the business sector and the debt of the company (Harris and Raviv, 1991, Brealey and Myers,

2003), to the extent that belonging to a specific sector determines the economic risk, asset composition, and consequently, the nature of the needs and financial resources.

Some evidence in relation to the incidence of the factor size in indebtedness have also been found. Size is one of the features of the company that determines its financial structure, although its effect on this is not clear. The larger the size of a company is, minor should be, in principle, its probability of insolvency and its agency costs. It would point to a direct and positive relationship between size and level of debt. But at the same time, the size could also improve the problems of asymmetric information regarding foreign investors and reduce emission costs. This would increase the company preferences towards equity issuance against debt (Rajan and Zingales, 1995).

Hol and Van der Wijst (2008), in a review of international empirical studies published in connection with the performance of the existing partial theories on the financing of the company, revealed the absence of conclusive results to support unequivocally the acceptance or widespread rejection of any of them. Some of these studies also found serious difficulties to corroborate results obtained by other authors when the conditions of the sample companies were modified.

Regarding the empirical research on the financial structure of companies in the agricultural sector, several studies have analyzed the relationship between leverage and efficiency. Hailu et al. (2005) showed that, on a sample of Canadian fruit and vegetable cooperatives, the debt level negatively affects the efficiency of the cooperative; it was estimated using a cost function. However, other authors (Chavas and Aliber, 1993; Nasr et al, 1998) found significant and positive relationships between efficiency and debt, although with different nuances in relation to the measurement of the efficiency and the nature of the debt. Meanwhile, Alarcon (2008) shows that as the efficiency of Spanish agricultural enterprises increases also increase their debt ratios in the short term and discards that excessive indebtedness in business could deteriorate efficiency. Nor Lajara-Camilleri and Mateos-Ronco (2012) showed a conclusive relation between financial structure and corporate performance or achievement for a sample of Spanish agricultural cooperatives evaluated using a variable obtained from accounting ratios.

The hypothesis of the Theory of Optimal Financial (Trade-off Theory) suggests that borrowing generates some positive effects on the company, leading to a combination of funding sources, own and others, which maximizes the value of the firm and minimizes the average cost of its resources. One of these effects, of particular interest to this research, is the tax advantage that can make the use of external financing, given the tax deductibility of interest expense.

Cooperatives in Spain are subject to a substantive tax regime that confers them the status of protected or specially protected entities. The reduction in tax revenues for the payment of interest associated with the debt could be, in principle, an incentive for the use of debt as a funding source. However, DeAngelo and Masulis (1980) suggest that the tax incentives associated with debt is reduced by another type of "tax shelters" (e.g., depreciation expenses) which may be a substitute to the tax advantages associated with paying financial interests. The consequence in the financial structure of the company and its composition is that entities that already have significant tax incentives not associated to external financing will draw less on debt and, in any case, they will extend the maturity (opting for long-term debt) as a means to ensure that the tax benefits accruing are not less than the cost of incurring in new debt in the short term.

To test this hypothesis the authors have suggested the use of the depreciation cost as an independent variable and, more specifically, Hol and Van der Wijst (2008) propose the use of the ratio between depreciation expenses and total expenses as an independent variable. Since the tax shield associated with no debt gives companies an incentive to use less debt or mainly use long-term debt, the initial hypothesis is the existence of a negative correlation between depreciation expense and the amount of total debt and short term, and a positive relationship between this variable and the long-term debt.

The second hypothesis to be tested relates to the compliance of the Pecking Order Theory in agri-food companies. *A priori* the general behavior of these entities, in which usually prevail the short term objectives via settlements prices to the detriment of long term business orientation whose priority is the financial strength of the company, seem to point to a behavior completely different to the theory. Self-financing through the profits doesn`t seem the first choice of funding in these entities, as they grant to the generation of surpluses a minor relevance in relation to the distribution of these benefits via prices. Therefore, in this case, it is foreseeable the existence of an inverse relationship (significant or not) between leverage and capitalization, which are the predominant sources of funding in the absence of internal financing.

To test the hypothesis of the Agency Theory suggested by Jensen (1986) in relation to the free cash flows generated[1], the independent variable sales growth has been used (Scherr y Hulburt, 2001). The idea behind this approach is that the generation of free cash flows, i.e., flows of surplus cash once funding requirements have been covered, encourages the distribution of dividends. The use of the proposed variable implicitly assumes that increases in sales in the past last in the future. The empirical implication is that high rates of sales growth are associated with a lower level of debt, prevailing short-term debt to the detriment of long-term debt.

Regarding the composition of debt, several authors have shown that the match between the maturities of assets and debt reduces agency costs of such debt (Myers, 1977; Stohs and Mauer, 1996). The existence of a balance between the maturity of the debt and the composition of the active (current / non-current) will reduce the risks of default (in case the debt maturity is prior to the liquidity assets) and financial structure will adapt to the (active) economic structure. A variable that relates current assets to total assets has been used in order to empirically evaluate this hypothesis by pairing maturities ("maturity matching principle"). The hypothesis to be tested is the existence of a positive correlation between this ratio and the amount of short-term debt, and negative correlation in the case of long-term debt.

Directly related to the above hypothesis is necessary to contrast the relationship between liquidity of the entity and the composition of debt in its financial structure. In order to study this aspect, liquidity ratios have been employed, i.e. relationships between accounting variables that assess the ability of the entity to meet its immediate liquid assets with its most liquid assets. The hypothesis is that there is a positive relationship between the ratios of liquidity and short-term debt.

Traditionally, the *size* of the entity has been a recurring variable in empirical studies on the financial structure of the company, although its real implications have not been demonstrated conclusively (Hol and Van Der Wijst, 2008). Most published studies suggest a positive relationship between firm size and the level of debt, which seems justified by the possibility of large firms to achieve economies of scale through long-term debt facilities or major access to capital markets, among others.

In the case of agricultural cooperatives, previous work (Mateos-Ronco and Lajara-Camilleri, 2011) have revealed the existence of significant differences in their financial structure based on the size of the entity, being the medium cooperatives the ones that have a higher proportion of debt capital. However, other authors (Holm et al., 2010) do not appreciate on a sample of horticultural cooperatives, a clear relationship between the size of cooperatives and their economic and financial performance. There is also no conclusive evidence on the relationship between the size of the cooperative and its efficiency. Galdeano (2006) identified a positive relationship between the two variables, although not significant, and established relationships with other empirical studies that reach the same conclusion.

[1] Jensen (1976, 1986) suggests a positive relationship between leverage and efficiency as the most indebted companies increase their efficiency when requiring more effort to meet its financial obligations. Besides a reduction in agency problems between owners and managers in relation to the free cash flow is generated given that a way to increase efficiency in firms with excess of cash flow is through increases of dividend policies.

To assess the potential impact of the size of the cooperative on its debt, as well as its composition, a variable calculated as the logarithm of the book value of total assets of the entity was used, as well as the same variable but referred to the precedent year. The most common assumption seems to suggest a positive relationship between long-term debt and the size of the cooperative and a non-significant or even negative in the case of short-term borrowing effect.

Finally, it might have been convenient the analysis of the relationship between the level of debt (and composition) and the productive activity of the cooperative. Clearly one or other activity determines the composition of the economic structure of the entity (assets) and therefore could condition its financial structure. In this sense, belonging to the same sector can lead to overlaps in terms of funding decisions, yes obviating the effect they have other variables (size, volume of business, investment strategies, etc.). Previous studies have suggested and analyzed these relationships, although it should be noted that most of these studies have focused on major sectors (industry, services).

In this paper the introduction of a variable relative to productive activity (dummy variable) has been rejected due to the poor quality of the available information about the database. Cooperatives of the sample present various activities within the agricultural sector, preventing their classification into homogeneous groups. This could have generated fictitious and misleading results derived from a classification error. For this reason the inclusion of this variable in the regression analysis has been avoided.

In view of the results obtained from the theoretical framework, we understand that at the micro level there are still unresolved issues relating to the characterization of the financial structure of the companies. The various types of financing and their effect on key variables of the same may differ according to the business type analyzed. In fact, the literature reviewed concluded seems to conclude that the results of each of the published empirical studies are difficult to extrapolate to other samples of companies from different business sectors or business type. For this reason, this paper aims to contribute to the advancement of knowledge of the financial structure of the cooperative societies of Spanish agriculture.

3. Methodology

3.1. Sample

The population under study consists of the set of cooperatives societies engaged in agribusiness activities whose geographical area comprises Spain. This represents a total population of 3.861 cooperatives, according to Cooperativas Agro-alimentarias (2012), which obviously leads to the need to obtain a statistically significant sample of the population to apply statistical analysis operatively.

Since the information requirements for the study are of accounting nature, the sample selection was made from the information provided by the financial database SABI (Sistemas de Análisis de Balances Ibéricos). This database is compiled by Bureau Van Dijk Electronic Publishing and Informa, and collects economic and financial information on more than 550.000 Spanish companies.

The search was performed based on the following criteria:

- Legal form of the company: cooperative. The database includes also in this group the s Sociedades Agrarias de Transformación (SAT), however theses entities have been eliminated from the sample in order to focus the analysis in the cooperative form.
- Activity sector: selected by the classification NACE 2009, the sectors falling code 01 (Agriculture, Livestock, Fishing and services related thereto) and code 10 (Food industry).
- Number of employees: at least 1.
- Availability of accounts: 2007, 2008 and 2009.

Selected companies from the former search were debugged, eliminating those that had inconsistent data, such as negative equity, or lack of information on aspects considered relevant to the study. The financial information relating to 2009 of the resulting 181 cooperatives is one of the final samples of this study.

Additionally, and in order to perform dynamic analysis to evaluate the possible effects of macroeconomic conditions and financial constraints on the determinants of the financial structure of the entities under study, we have obtained a second sample using the same criteria for this search above but restricted to the temporal scope of the years 2005 and 2006. This second sample consists of a total of 90 cooperatives which also has financial information on 2009. The aim is to characterize the financial structure of agricultural cooperatives before the start of the economic and financial crisis, while the sample obtained for 2009 will be the basis for characterizing the entities in an environment of crisis.

The first analysis on the mean test has been performed using two samples with the same individuals (90 cooperatives for which accounting data are available, 2006 and 2009), although the regression analysis linear has been done on the initial sample of 181 cooperatives with selected information relating to 2009.

3.2. Sample characterization

A characterization of the two samples has been performed in order to highlight the most relevant aspect of them prior the regression analysis. The results are included in the following tables.

TABLE 1
Descriptives of the 2006 sample

(Thousands of €)	Minimum	Maximum	Mean	Std. Deviation	Median
Total Assets	145,00	154.254,00	7.707,5000	20.758,43137	1.722,00
Turnover	70,00	415.552,00	11906,8333	47637,02403	2.495,50

Employees	1,00	344,00	20,8889	48,52963	6,0000
Variation of Sales (2005-06)	,32	4,07	1,0647	,47203	1,0471
Debt (%)	1,09	104,00	65,4768	24,16906	72,1500
Liquidity (Current Assets/Current Liabilities)	,30	34,81	1,8367	3,80556	1,0300
Capitalization ratio	,04	,99	,3448	,24193	,2750
Amortization/Expenses	,00	,98	,0782	,15943	,0300
Current Assets/ Total Assets	,06	1,00	,5327	,22285	,5425
Total Asset Turnover	,11	6,05	1,6912	1,42288	1,1200

As it can be seen, the data point to a significant heterogeneity within the sample of cooperatives, with wide ranges in most indicators, significant differences between mean and median values and high standard deviations.

The preceding analysis shows a low capitalization in agri-cooperatives on average and therefore its dependence on external financing, as revealed by their debt ratios (65%).

In the 2009 data (Table 2) the heterogeneity observed in the 2006 sample remains, it is deduced not only from the wide range defined by the minimum and maximum values (which in the case of liquidity ratio can be from 0.21 to 59.00) but also from the high standard deviations and the substantial difference between mean and median.

The average values of the indicators related to size (assets, turnover and number of employees) would lead to think that, according to the Recommendation of the European Commission of 6 of May 2003 concerning the definition of micro, small and medium enterprises, in average the sample should be considered small because although the annual turnover exceeds 10 million Euros (limit to differentiate small and mediums companies), total assets and employees are in the range set for small ones. So, following the Recommendation of the Commission that states “the criterion of the number of employees […] remains undoubtedly one of the most significant and must be observed as the main criterion” should be concluded that the classification as small companies in average would be the most appropriate one.

However, according to the dispersion observed in the data, it seems more appropriate to use median values instead of mean ones. In this case, two of the conditions for classification as micro company are checked, as the balance amounts to 1.95 million Euros and the number of employees is 6.5. So it seems fair to conclude that the dominant business size is the micro-company, which agrees with the current reality of the food cooperative sector, characterized by the small size of their bodies.

TABLE 2
Descriptives of the 2009 sample

(Thousands of €)	Minimum	Maximum	Mean	Std. Deviation	Median
Total Assets	104,00	181.328,00	8.138,9778	22.634,64566	1.948,0000
Turnover	77,00	439.131,00	12.927,6556	50.925,21748	2.322,0000
Employees	1,00	326,00	23,0556	51,29938	6,5000
Variation of Sales (2008-09)	,47	2,78	,9783	,39876	,8763

Debt (%)	,00	,99	,4011	,21691	,3748
Liquidity (Current Assets/Current Liabilities)	,21	59,00	2,7775	7,77088	1,2498
Capitalization ratio	,01	1,52	,3721	,26027	,3175
Amortization/Expenses	,00	,04	,0504	,06772	,0280
Current Assets/ Total Assets	,06	1,00	,5149	,22415	,5251
Total Asset Turnover	,06	7,18	1,7221	1,59156	1,1928

On the evolution of the indicators in the years to study, and considering the values of the median as the most representative of the sample, some disparity is observed in the variables related to size (total assets, turnover and number of employees). On the one hand assets have increased by 13% as well as the number of employees (8%), on the other net sales decreased approximately 7%.

TABLE 3
Comparison of median values between 2006 and 2009

(Thousands of €)	2006	2009
Total Assets	1.722,00	1.948,0000
Turnover	2.495,50	2.322,0000
Employees	6,0000	6,5000
Variation of Sales (2008-09)	1,0471	,8763
Debt (%)	72,1500	37,48
Liquidity (Current Assets/Current Liabilities)	1,0300	1,2498
Capitalization ratio	,2750	,3175
Amortization/Expenses	,0300	,0280
Current Assets/ Total Assets	,5425	,5251
Total Asset Turnover	1,1200	1,1928

However, the most important reduction is the one affecting indebtedness in cooperatives, reducing the median ratio from 72, 15% to 37,48%. This circumstance may seem to be based on the limited Access to credit occurred in the early years of the financial crisis that coincide with the period under study.

Alongside an increase in liquidity is observed, this may respond not only to an increase of current assets but also to a decrease in current liabilities, which would also be explained by the reduction of debt already mentioned.

3.3. Mean test for paired samples

The observed differences in the values of indicators in the two selected time points (2006 and 2009) were statistically contrasted by a T test of means in paired samples (Table 4) applied to the simple of 90 Spanish agrifood cooperatives for which there is financial information available.

Consequently, on average, agri-cooperatives show less debt in 2009 (M=40,11, SE=21,69) compared to those reached in 2006 (M=65,47, SE=24,16).

The second statistically significant difference affects depreciation and amortization to total expenditure. This value is also lower in 2009 (M=0,0492, SE=0,06705) compared to the ones corresponding to 2006 (M=0,0782, SE=0,15943).

Other variables included in the analysis show no statistically significant variation in the values obtained in the years 2006 and 2009.

4. Regression analysis

Statistical differences observed in T tests between the two samples analyzed appear to show different behaviors with respect to the funding strategy of agri-cooperatives in Spain depending on the time horizon, so that macroeconomic difficulties and funding constraints arising from the economic crisis seem to have reduced levels of debt of these entities.

To complete these initial findings, the analysis is centered in factors that affect or condition the financial structure of the sample selected referred to 2009, i.e. full economic and financial turmoil.

4.1. Variables

The method used to study the factors that affect the financial structure of the Spanish agricultural cooperatives has been the multiple linear regression analysis. To this end, a number of variables have been selected so that according to the theories of financial structure discussed in section 2, seem to have some theoretical effect on financing decisions.

As the composition of debt and its determinants will be analyzed in this paper, the ratios of short term debt (short term debt over total debt), long term debt (long term debt over total debt) and total debt (total debt over total assets) have been defined as dependent variables.

TABLE 4
Paired samples test

		Paired differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Growth_2006 – Sales growth	,10261	,64244	,07519	-,04728	,25251	1,365	72	,177
Pair 2	maturity_2006 - Maturity_matching	,01773	,18531	,01953	-,02108	,05654	,908	89	,366
Pair 3	LnATn_2006 - Ln_ATn	-,13837	1,41076	,14871	-,43385	,15710	-,931	89	,355
Pair 4	LnATn1_2006 - Ln_ATn1	-,09814	,89437	,10468	-,30682	,11053	-,938	72	,352
Pair 5	Total Assets_2006 – Total Assets	-431,47778	26438,94804	2786,90982	-5969,00824	5106,05268	-,155	89	,877
Pair 6	Sales_2006 - Sales	-1020,82222	27517,17712	2900,56515	-6784,18339	4742,53895	-,352	89	,726

Pair 7	Employees_2006 - Employees	-,24691	47,50277	5,27809	-10,75064	10,25681	-,047	80	,963
Pair 8	Debt_2006 - Debt	25,36462	25,45097	2,68277	20,3402	30,69522	9,455	89	,000**
Pair 9	Liquidity_2006 - Liquidity	-,94080	6,47051	,68205	-2,29602	,41442	-1,379	89	,171
Pair 10	Capitalization_2006 - Capitalization	-,02731	,25479	,02686	-,08067	,02606	-1,017	89	,312
Pair 11	amortiz_expenses_2006 - amortiz_expenses	,02896	,11125	,01186	,00539	,05253	2,442	87	,017*
Pair 12	TA_turnover_2006 – TA_turnover	-,03085	1,10977	,11698	-,26329	,20159	-,264	89	,793

The definition of the independent variables is derived from the testing of the hypotheses above and summarized in the following table.

TABLE 5
Hypotheses to be tested and independent variables

Hypotheses to be tested	**Independent variables**	**Code**
H_1: Theory of Optimal Financial	Amortization expenses / Total Expenses	Amort.
H_2: Financial Hierarchy Theory (pecking order)	Capitalization (Capital+Reserves)/(E+Liabilities)	Capit.
	Self-financing (Cash flow/Fixed Assets)	Autofin.
H_3: Agency Theory	Sales growth ($Sales_N/Sales_{N-1}$)	Sales
H_4: Match Maturity	Asset structure (CA/TA)	Assets
	Liquidity ratio (CA/CL)	Liq.1
	Working capital / PC	Liq.2
	Cash ratio (Cash equivalents+Cash)/CL	Liq.3
H_5: There is a relationship between leverage and firm size	Log. TA_N	$Log.A_N$
	Log. $TA_{(N-1)}$	$Log.A_{N-1}$

TA: Total Assets. E: equity. CA: Current Assets. CL: Current Liabilities.

The variable defined in Table 5 to measure self-financing has been defined attending to the features of cooperatives, correcting the economic cash flow (income+depreciation) by the addition of the acquisitions of products to partners (supplies).

As already noted, the usual practice of agricultural cooperatives of maximizing the prices offered to their partners in their supplies of products to the cooperatives prevailing over profit generation, introduces peculiarities in the interpretation of information in their profit and loss accounts. It is usual in these entities to use this strategy as a way to share out cooperative surpluses, trying to get a minimum net profit (or even zero) to avoid higher taxation and greater demands on the strength of its mandatory reserves. For this reason, all variables using information on accounting results should be modified by calculating a corrected net income, which is developed according to market criteria (Gómez-Limón et al, 2003). However, in this case this approach was dismissed because of the difficulty of performing this correction from only the accounting information of these entities. Moreover, the price differential paid by each cooperative is different for each of their products, so it could result in outliers and unreal data for this variable.

According to substantive accounting regulation[2] these settlements to partners are valued at acquisition cost, i.e., the amount paid or payable by the cooperative and are included in the section of Supplies of the operating income in the profit and loss account. This section will specifically collect those payments under the name of "consumption stocks partner". However since the available information in the database is certainly limited in this regard and does not follow those formal adjustments to the financial statements compulsory for cooperatives, it has been needed to correct the net income by using the whole section of Supplies, assuming that it represents a combination of actual procurement cost and also a sharing via settlement prices.

Even though it is not the aim of this study the assessment of the possible relationships between indebtedness and business efficiency, it has been considered desirable to introduce as an independent variables the total asset turnover (RotA), defined as the ratio of sales and total assets of the company, in order to obtain possible relationships between the level and composition of debt and the productivity of investment in assets.

4.2. Results

Using the independent variables previously defined based on the theoretical framework (Table 4), three different multiple linear regression analysis by successive steps have been performed. The dependent variables have been indebtedness, short-term debt and long-term debt.

The multiple linear regressions were conducted on the sample of 181 Spanish agri-cooperatives in 2009, removing some of the entities that showed anomalous data in any of the selected variables, due possibly to the quality of the information source.

The three analysis obtained have proved significant in the analysis of variance test (ANOVA), validating the results of the regression (Table 6).

TABLE 6
ANOVA

		Model		Sum of squares	df	Mean square	F	Sig.	R^2	Durbin-Watson
Debt	(Constant), Amort., Liq.2, Capit.	1	Regression	8,108	3	2,703	283,891	,000[a]	0,833	2,104
			Residual	1,590	167	,010				
			Total	9,697	170					
Short term debt	(Constant), Sales, A turnover, Capit., Liq.2, Assets	1	Regression	4,317	5	,863	64,955	,000	0,709	1,983
			Residual	1,675	126	,013				
			Total	5,992	131					
Long term debt	(Constant), Sales, Capit., Liq.2, Assets	1	Regression	2,087	4	,522	47,867	,000	0,620	2,000
			Residual	1,210	111	,011				
			Total	3,297	115					

Table 7 shows a summary of the variables that have been significant in the analysis and the nature of the relationship, depending on whether it is direct (positive coefficient) or reverse (negative coefficient).

[2] Order EHA/3360/2010, of 21st December, establishing the rules on the Financial Aspects of Cooperative Societies. Eighth Rule "Procurement of goods to partners".

TABLE 7
Variables determining the indebtedness of agricultural cooperatives

Hypotheses	Variables	Debt	Short term debt	Long term debt
H_1: Theory of Optimal Financial	Amortization expenses / Total Expenses	(-)	NS	NS
H_2: Financial Hierarchy Theory (pecking order)	Capitalization (Capital+Reserves)/(E+Liabilities)	(-)	(-)	(-)
	Self-financing (Cash flow/Fixed Assets)	NS	NS	NS
H_3: Agency Theory	Sales growth ($Sales_N/Sales_{N-1}$)	NS	(+)	(-)
H_4: Match Maturity	Asset structure (CA/TA)	NS	(+)	(-)
	Liquidity ratio (CA/CL)	NS	NS	NS
	Working capital / PC	(-)	(-)	(+)
	Cash ratio (Cash equivalents+Cash)/CL	NS	NS	NS
H_5: There is a relationship between leverage and firm size	Log. TA_N	NS	NS	NS
	Log. $TA_{(N-1)}$	NS	NS	NS

(NS): Non significant variable. (-): Significant variable, negative coefficient. (+): Significant variable, positive coefficient.

The results verify the *Theory of the Optimal Financial* only when considering the total debt of the entity. That means an inverse correlation between depreciation expense and the amount of debt; this can be interpreted as a possible use of debt by the institutions of the sample represents a form of tax incentive.

Moreover, and as expected, the variables related to self-financing are not significant in any of the models, this seems to contradict the fulfillment of the *Theory of the financial hierarchy* in cooperatives. However the coefficients of the variable of capitalization are significant in the three analyses and in all cases show a negative sign. These results point to a scarce culture of self-financing, prevailing –as mentioned before- the highest settlement to partners. The financial sources used are external ones, both own and others, but inversely related. In this sense and referring to capitalization in cooperatives, three facts should be noted: the traditional problem of under-capitalization of these entities, the impact of public protection through subsidies and the treatment given to the social capital in cooperatives by accounting regulations.

Neither the empirical results show evidence of the existence of a significant relationship between the size of the entity and its financial structure. Although general theories usually point a positive relationship between them, the work on cooperatives has not verified this hypothesis, as in this case.

The result obtained in the regression analysis of the indebtedness shows that it depends on liquidity, degree of capitalization and weight of depreciations in all expenses. As it appears in Table 8, the three variables obtain negative coefficients in the analysis, indicating that there is an inverse relationship, i.e. high liquidity ratios and important degrees of capitalization lead as expected to lesser dependence on external funding.

TABLE 8
Debt

Model	Unstandardized coefficients		t	Sig.
	B	*Std. Error*		*B*

1	(Constant)	,937	,015	60,492	,000
	Liq.2	-,006	,002	-3,622	,000
	Capit.	-,949	,037	-25,400	,000
	Amort.	-,184	,093	-1,976	,050

In relation to the variables that explain the composition of the short-term debt (Table 9), it is noteworthy that the positive relationship is evident both in the case of the total asset turnover and asset composition, corroborating the hypothesis of the maturity matching principle and showing the existence of a balance between the maturity of the debt and asset composition.

Finally, according to the initial hypothesis, in the short-term debt it appears as significant the degree of capitalization, being this relation of reverse character since when capital and reserves mean an important weight in the financial structure, short term debt is reduced due to the negative sign of the coefficient obtained.

TABLE 9
Short term debt

Model		Unstandardized coefficients		t	Sig.
		B	***Std. Error***		
1	(Constant)	,190	,038	4,928	,000
	Assets	,505	,051	9,854	,000
	Liq.2	-,024	,003	-8,553	,000
	Capit.	-,321	,049	-6,599	,000
	Asset Turnover	,016	,006	2,593	,011
	Sales	,057	,022	2,650	,009

a. Dependent variable: short_term_debt

Referring to variables that are significant as a result of the regression analysis using the long-term debt as dependent variable (Table10), it should be noted that except in the case of liquidity, other variables appear with a negative sign, i.e. they relate inversely with long-term debt. Both the cap and the asset composition ratio have an important weight in the analysis, with negative coefficients. These results are consistent with the literature. Next, in descending order of importance in absolute value, liquidity is positioned, establishing a proportional relationship with the borrowing in the long term. This relationship, although it was not included in the initial research hypotheses, has been demonstrated in previous empirical studies (Van der Wijst and Hol, 2008).

TABLE 10
Long term debt

Model		Unstandardized coefficients		t	Sig.
		B	***Std. Error***		
1	(Constant)	,751	,050	15,029	,000
	Assets	-,595	,051	-11,693	,000
	Liq.2	,159	,022	7,199	,000
	Capit.	-,684	,062	-10,966	,000

Sales	-,090	,033	-2,770	,007

5. Conclusions

The empirical evidence provided by this paper mean a further step in the understanding of the financial structure of the company at the micro level, in relation to a specific business type, the cooperative, which has substantive features that identify and simultaneously differentiate of all other corporations.

A first descriptive analysis of the sample of Spanish agricultural cooperatives reveals the importance that small-scale entities, classified as *micro,* have in the sector. This fact has been repeatedly rated as an endemic evil of Spanish agricultural cooperativism, which should look for higher rates of competitiveness through the economies of scales derived from business sizes more according to the current economic scenario.

With regard to the impact that the macroeconomic situation has had on the funding strategy of these entities, it seems evident, as expected, that the economic environment has lessened access to external financing. As a consequence there is a significant reduction on the debt ratios in the entities of the sample between 2006 and 2009. In addition, a statistically significant reduction in depreciation expenses in relation to total expenses of these entities is also observed. This may be due to different factors such as the decision to slow down the rate of depreciation and amortization with the aim of not to ballast economic results which may also have been reduced responding to the economic situation, or even the reduction of capital expenditure as a result of the difficulties and restrictions on access to finance.

Regarding the Theory of Financial Optimal, H_1 of this paper, only the inverse relationship between the ratio of amortization expense and total expense to total debt is verified with statistical significance. It means that tax benefits associated with investing in property encourages companies to reduce the use of external financing. However there were no significant results in reference to borrowing in the short and long term so it is not possible to conclude whether this tax protection not linked to debt has a positive impact on external financing in the long term, as pointed in earlier studies.

In the case of the Theory of Financial Hierarchy, second hypothesis of this study, only one of the selected variables has achieved significant results in the statistical analyzes. The capitalization ratio is inversely proportional to the debt variables, both overall and considering maturity. This result is consistent with the stated hypothesis, confirming Pecking order theory and supporting the initial hypothesis that indebtedness and capitalization, in the absence of self-financing, are the predominant sources of financing agri-cooperatives.

Regarding compliance with the Agency Theory, the variable has been statistically significant in both the model of short-term debt and long-term one, positive in the former and negative in the latter. Achieved values support the opinion of Scherr and Hulburt (2001), showing that growth in sales, thus generation of cash flows, lead to higher short-term debt, while decreasing the use of long-term debt.

The evaluation of the hypothesis of the maturity matching principle reveals a positive relationship of the variable debt with maturity less than one year and negative with one that exceeds this period. This supports the existence of a balance between the maturity of debt and asset composition. By contrast, the relationship between the ratio of liquidity and short-term debt has proved inversely proportional in the sample, which would seem to suggest that the lack of liquidity in such entities encourages the use of short-term external financing. This conclusion is consistent with the reality of the Spanish agricultural cooperative tissue, characterized by constant liquidity problems leading to these entities to seek for capital financing lines.

Finally, referring to the hypothesis that tries to relate the business dimension of entities with its financial structure, the analysis carried out does not demonstrate any relation between these variables since they have not been statistically significant in any of the proposed models.

The results of this study are significant and contribute to add empirical evidence to construct a theory of financial structure in cooperatives. The composition of financing in this type of entities and the study of its relationship to other factors is crucial, especially in current times when access to financial resources is limited. However, we must recognize certain limitations to the study, as the fact of having constrained the study to a particular sector, the poor quality of accounting information which is not adapted to the particularities of the studied entities, the heterogeneity observed in the samples, the fact of having handled in the regression analysis accounting data for a single fiscal year (2009) and the use of regression techniques with variables that have marked asymmetries. Subsequent studies extended to other sectors of activity certainly will contribute to a better understanding of the economic and financial situation of some of the entities of the Social Economy.

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