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How SME Uniqueness
Affects Capital Structure:
Evidence From A 1994–1998
Spanish Data Panel

Francisco Sogorb-Mira

ABSTRACT. The principal aim of this paper is to test how firm characteristics affect Small and Medium Enterprise (SME) capital structure. We carry out an empirical analysis of panel data of 6482 non-financial Spanish SMEs during the five years period 1994–1998, modelling the leverage ratio as a function of firm specific attributes hypothesized by capital structure theory. Our results suggest that non-debt tax shields and profitability are both negatively related to SME leverage, while size, growth options and asset structure influence positively SME capital structure; they also confirm a maturity matching behaviour in this firm group.

KEY WORDS: capital structure, financing, panel data, pecking order theory, SME, trade-off theory

JEL CLASSIFICATION: C23, G32, G33

1. Introduction

It is generally accepted that small and medium enterprises, hereinafter SMEs, represent a vast portion of the firm tissue of almost every developed country. In this respect, the Sixth Report on European companies carried out by the European Commission (2000), reveals that the total number of firms existing in the European Union in 1998 mounted up to 19,370,000, from which 99.8% were considered SMEs. Moreover, these SMEs

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provided approximately 66% of European employment and 65% of European companies' turnover. The records for Spain are in line with the European ones: there were 2,591,318 SMEs (99.8% of total firms) in 2000, providing 79.8% of Spanish employment and 62% of Spanish firm's total sales (DGPYME, 2002). All these figures show the great importance of this category of firms, but not always receiving the just attention that they really deserve. In the words of Zingales (2000, p. 1629): *"Empirically, the emphasis on large companies has led us to ignore (or study less than necessary) the rest of the universe: the young and small firms, who do not have access to public markets"*.

One of the areas of financial economy that has greatly worried academics and professionals is debt policy decisions in companies. Although there are many previous empirical studies of financing decisions of large and listed companies,[1] the scientific community has only started to pay attention to the small firm sector much more recently. In spite of this, we now have available a considerable number of empirical works worldwide that have studied capital structure in SMEs like Van der Wijst (1989) for The Netherlands and Germany, Holmes and Kent (1991) for Australia, and Van der Wijst and Thurik (1993), Chittenden et al. (1996), Hamilton and Fox (1998), Jordan et al. (1998), Michaelas et al. (1999), and Hall et al. (2000) for the United Kingdom. As far as the Spanish context is concerned, most of the research on SME capital structure has been essentially descriptive (Maroto, 1996; López and Romero, 1997) or the firm sample was biased to the industrial sector and the bigger companies (Ocaña et al., 1994). Much more recently, the studies of financial policy in Spanish SMEs have incorpo-

rated different estimation techniques like analysis of variance (López and Aybar, 2000) and panel data estimation (Aybar et al., 2001; Cardone and Cazorla 2001).

Following this line of research, we aim to obtain the main determinants of debt policy decisions in small firms. In doing so, we will explain how firm characteristics affect Small and Medium Enterprise (SME) capital structure. Our study present four main differences from those references cited before for the Spanish context: (i) it employs an objective definition of SME, that is valid for the European ambit, (ii) the firm sample covers all economic activities in the Spanish economy with a greater number of observations, (iii) it extends the number of theoretical hypotheses considering fiscal aspects of the financing decisions, and (iv) it applies panel data methodology allowing for individual heterogeneity, economic activity and time effects. Besides, we intend to get empirical evidence about how SMEs take up financing decisions for another developed country. In this sense, we will be able to verify the degree of robustness of previous studies such us Jordan et al. (1998), Michaelas et al. (1999) and Hall et al. (2000).

Our results confirm DeAngelo and Masulis (1980) fiscal approach, which states that non-debt tax shields are negatively related to leverage. We also find that Spanish SMEs seem to follow the maturity matching principle, as they try to finance their fixed assets with long term debt and their current assets with short term debt. Finally, both firm size and profitability show the expected signs with leverage ratio, that is, a positive relationship and a negative relationship, respectively.

The structure of the remainder of the paper is as follows. Section 2 studies how the existing capital structure theories can be used to explain the financing decisions in the small business sector and at the same time we present the empirical hypotheses extracted from the theoretical background that will be tested using a Spanish small and medium enterprise sample. Section 3 explains in detail all the variables used in the study; it also describes how we have constructed the firm sample. The model employed, as well as the econometric techniques that we have applied, are discussed in Section 4. Also in this section we show the empirical results of the study with their implica-

tions. Finally, we conclude in Section 5, where we also include some proposals for the future line of research in this area.

2. Theoretical discussion and empirical hypotheses

The seminal work of Modigliani and Miller (1958) set up the basis for the development of a theoretical body around the firm capital structure issue. Its main proposition establishes that the valuation of a company will be independent from its financial structure. As this conclusion is absolutely correct under the assumptions made by Modigliani and Miller (1958),[2] the latter development of the theory has been produced by relaxing these fundamental assumptions, also with the aim of approximating the theory to the firm reality. From this point of view, we can categorize capital structure theory under different stances, depending on which economic aspect and firm characteristic we focus on.

The conventional analysis of capital structure states that firms determine their leverage level trading off the benefits against the shortcomings that provides debt employment (Scott, 1976; Bradley et al., 1984). Under this line of reasoning, emerges the so-called Trade-Off Theory (TOT), which includes fiscal, financial distress and interest conflicts issues.

Concerning the fiscal approach of the TOT, Modigliani and Miller corrected their original paper in 1963 concluding that firms would prefer debt to other financing resources due to the tax deductibility of interest payments. Therefore, our first TOT hypothesis will be: *"The effective tax rate should be positively related with debt"* (H1).

Some authors, for example Pettit and Singer (1985) have pointed out that this fiscal approach cannot be applied in the small firm context, because SMEs are less likely to be profitable or at least to have abundant benefits, and are therefore less likely to use debt in order to get tax shields because they will not need them. Following this line of reasoning the foregoing hypothesis could be established as *"there should not exist any relationship between debt and taxes in SMEs"* (H1bis).[3]

On the other hand, DeAngelo and Masulis (1980) show that there are alternative tax shields

such as depreciation, research and development expenses, investment deductions, etc., that could substitute the fiscal role of debt. Therefore, our second fiscal approach hypothesis will be: *"Non-debt tax shields ought to be negatively related to leverage"* (H2).

From a financial distress perspective, Warner (1977), Ang et al. (1982) and Pettit and Singer (1985) state that larger firms tend to be more diversified and fail less often, so size can be an inverse proxy for the probability of bankruptcy.[4] Likewise, small companies usually have bigger bankruptcy costs in relative terms (Ang et al., 1982). Based on these assertions, we can construct our third TOT hypothesis in the following manner: *"Firm size should be positively related to debt level"* (H3).

Agency theory investigates the conflict of interests between the various financial stakeholders of the firm. Basically, this theory considers the conflict of interest brought about, on the one hand, between shareholders and debtholders and, on the other hand, between shareholders and managers. SMEs are not likely to suffer from this second problem due to the fact that their property identifies almost exactly with their management and thereby there will only be a unique financial objective for these two groups. Notwithstanding, the agency conflict between shareholder-owners and financiers may be particularly severe for small companies, increasing both the moral hazard and adverse selection problems (Van der Wijst, 1989; Ang, 1992).

Following Myers (1977), the underinvestment problem becomes more intense in companies with more growth opportunities, and this fact will cause creditors to reduce their supply of funds to this type of firms. One of the possible solutions to mitigate this problem could be the employment of short term debt by the firm. In theory, and according to Myers' assertion, there should be a negative relationship between debt and growth opportunities; however authors such as Michaelas et al. (1999) have propounded a positive relationship between these two variables because SMEs mainly use short term debt financing. In line with this last proposition, our fourth TOT hypothesis is: *"Growth opportunities ought to be positively related to firm leverage"* (H4). Nevertheless, this hypothesis could be decomposed into: (i) *"Long term debt*

should be negatively related to growth opportunities" (H4-a), and (ii) *"Short term debt should have a positive effect on growth opportunities"* (H4-b).[5]

The restriction of maturity length of credit offered by lenders may explain partially debt structure in SMEs. In this sense, small firms may use less long term debt, but probably more short term debt, than larger firms. This would suggest, following Bevan and Danbolt (2000b) and Hall et al. (2000), the following relationships in form of our fifth TOT double hypothesis: (i) *"Long term debt should be positively related to firm size"* (H5-a), and (ii) *"Short term debt should have a negative effect on firm size"* (H5-b).

The existence of debt agency costs like risk shifting, and potential problems of adverse selection and moral hazard, may induce creditors to require guarantees to their lending, materialized in collateral assets (Myers, 1977; Scott, 1977, Harris and Raviv, 1990). This kind of assets will retain value in case of a potential liquidation of the firm, and could be sold in the market to affront the firm's payment commitments. We formulate our sixth and last TOT hypothesis in the following terms: *"The firm leverage ratio should relate positively to asset tangibility"* (H6).

Myer's (1977) debt overhang problem deals with the fact that firm managers may pass up profitable investments (NPV > 0) if these projects were to benefit exclusively creditors. In fact, company owners will try to take up those investments that generate short term cash flows (managers myopia); however financiers will only be willing to lend resources at a greater kind of seniority, such as for example short term debt. According to this view and to the maturity matching principle from Brealey and Myers (2000), the preceding hypothesis H6 could be enlarged in the following sense: *"If firms aim to match maturities of assets and liabilities, we should observe a positive relationship between fixed assets ratio and long term debt ratio, while it would be negative if leverage ratio were short term"* (H6-a).

Finally, the existence of informational asymmetries between investors and managers takes us to the Pecking Order Theory (POT). In this context Myers (1984) and Myers and Majluf (1984) argue that there exists a hierarchy in the financing funds of companies. Due to informational asymmetries, firms will prefer internal to external capital

sources. This suggests that highly profitable companies will tend to finance investments with retained earnings rather than using debt. It is worth stressing that this way of firm financing could easily be applied to SMEs using the following reasoning: SME managers, that are usually at the same time shareholders of these companies, do not like to lose their property and control over these firms (Holmes and Kent, 1991; Hamilton and Fox, 1998), and therefore the acceptance of new shareholders will be almost insignificant, preferring internal financing to external resources to finance firm activity.[6] In case SMEs needed external funds, they would choose debt that does not reduce managers̓ operability, that is, short term debt which is not likely to include restrictive covenants. Based on this last theoretical stance, we propose these two hypotheses: (i) *"There should be a negative relation between leverage and firm profitability"* (H7), and (ii) *"SMEs employ predominantly short term debt as debt financing"* (H8).

3. Description of data source and variables

3.1. *Data source*

A key question in the literature on SMEs is the definition of what is really considered as a small business. Each author, in most of the cases, has defined this sort of business quite differently. For instance, Jordan et al. (1998) define SMEs as firms with fewer than 100 employees and less than 15 million € turnover; Michaelas et al. (1999) consider small independent private limited companies those with fewer than 200 employees; López and Aybar (2000) analyse companies with sales below 15 million € and Aybar et al. (2001) contemplate firms with sales under 2.4 million € (small) and firms with sales between 2.4 and 15 million € (medium). This fact suggests that there is not a general consensus on what constitutes a small business. Instead of taking any of the previous criteria, we have adopted the European Commission SME definition[7]: (i) companies with fewer than 250 employees, (ii) sales below 40 million €, (iii) total assets under 27 million € , and (iv) independent privately held.

The sample of SMEs considered in our study has been extracted from SABE (*Sistema de Análisis de Balances Españoles*), which is a database

that contains economic and financial information with up to eight years of history of more than 190,000 Spanish firms.[8] SABE is managed by Informa, S.A. and purports more than 95% of the companies from the 17 Spanish autonomous communities that deposit their financial statements at the Mercantile Registry Offices, and which have more than 601,000 € turnover or more than 10 employees. Their sources of information are the Mercantile Registry Offices, Official Bulletins (like BORME) and Chambers of Commerce, among others.

Specifically, we have selected those firms from this database that meet the following requirements: (i) fewer than 250 employees; (ii) less than 40 million € turnover; (iii) less than 27 million € total assets; (iv) positive equity resources (shareholders' equity) and also positive net income over the whole period of study; (v) not included in a bankruptcy process. The data set has been restricted to observations that embody all the essential variables available, and also these variables have a complete record over the period of examination.

The definitive number of firms that makes up our sample amounts to 6,482, for which we have accounting data for the five years period 1994–1998,[9] resulting in a 32,410 observations balanced panel data. It should be noted that our firm data panel is much more complete than those used in previous studies, and enjoys a greater number of observations.[10]

The vast majority of empirical studies about firm capital structure usually consider companies from mixed industries. However, almost all of them regularly exclude from their analysis firms belonging to the insurance and financial industry because of their specific financial behavior and particular nature.[11] Moreover, if we attempt to analyze the financing decision in SME, it would be meaningless to include the cited industries in our study.

Firm distribution by industries of our sample and the specific weight of each firm sector over the total sample is shown in Table I. These firms are representative of Spanish SMEs and their economic sectors.

As can be observed, both manufacturing and wholesale and retail trade prevail over other industries.

TABLE I
Firm distribution by industries and specific weights

Industry	Number of firms	Total firms (%)
Agriculture, forestry and mining	139	2.14
Manufacturing	2053	31.67
Construction	667	10.29
Wholesale and retail trade	2630	40.57
Hotels and restaurants	153	2.36
Transport and communications	237	3.66
Business services	445	6.87
Education, health, social work and others	158	2.43
Total	6482	100

3.2. Variables

In each of the empirical hypotheses that we formulated in Section 2 an economic or financial aspect of the firm was taken into account and the task that we face in this subsection is how to measure those attributes. Capital structure theory does not specify this issue clearly, which has taken some researchers such as Titman and Wessels (1988) or Harris and Raviv (1991) to conclude that the choice of appropriate both dependent and explanatory variables is potentially controversial. Nonetheless, previous empirical work can help us to define objectively the proxy variables needed to take on our study.

The variable that we intend to explain is SME capital structure, which we measure by total debt ratio (TDR): (Total Debt/Total Assets) (Jordan et al., 1998; Michaelas et al., 1999). However, as argued by Van de Wijst and Thurik (1993), Chittenden et al. (1996), Barclay and Smith (1999) and Bevan and Danbolt (2000a), any analysis of leverage determinants based only on total liabilities may screen the important differences between long-term and short-term debt. Consequently, in order to shed some light on this question and to get a better understanding of capital structure and its determinants, we also consider the following two measures of leverage: (i) Long-term debt ratio (LDR): $\frac{\text{Long Term Debt}}{\text{Total Assets}}$, and (ii) Short-term debt ratio (SDR): $\frac{\text{Short Term Debt}}{\text{Total Assets}}$.

As far as explanatory variables are concerned, we have selected several proxies that have been most used in the empirical literature. Tables A.1 and A.2 in the appendix show a summarized description of both dependent and explanatory variables.

- Effective Tax Rate (ETR) is defined as the ratio between tax paid and earnings after interest and before taxes (Kim and Sorensen, 1986; Ozkan, 2000).
- Non-Debt Tax Shields (NDTS) is measured using the ratio between depreciation and taxes (Titman and Wessels, 1988; Michaelas et al., 1999).
- Growth Opportunities (GO) is defined as the quotient between intangible assets and company assets (Michaelas et al., 1999).
- Asset Structure (AS) is measured as the quotient between tangible assets (fixed assets and inventories) and assets (Michaelas et al., 1999; Bevan and Danbolt, 2000a,b).
- Size (S) is obtained using the natural logarithm of total assets, with the aim of controlling a possible non-linearity in the data, and the consequent problem of heteroskedasticity (Cardone and Cazorla, 2001; Fama and French, 2002).
- Profitability is defined as the quotient between earnings before interest and taxes (EBIT) and assets (Michaelas et al., 1999; Fama and French, 2002).

A preliminary study of our data sample provides us with the main descriptive statistics of both dependent and explanatory variables that we collect in Table II.

A quick review of Table II reveals several matters. In the first place, total liabilities on average amount to about 61% of total assets value. If we split total liabilities into fixed liabilities (repayable in more than one year) and current liabilities (repayable in less than one year), the Figures 9 and 52%, respectively, show that debt financing

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TABLE II
Descriptive statistics of dependent and explanatory variables

Variable	Obs.	Mean	Std. Deviation	Minimum	Maximum
TDR	32410	0.6141	0.2286	0	0.9988
LDR	32410	0.0895	0.1337	0	0.9665
SDR	32410	0.5245	0.2293	0	0.9988
ETR	32410	0.1831	0.1068	0	0.8232
NDTS	32410	0.0353	0.0364	0	1.2236
GO	32410	0.0347	0.0722	0	0.9386
AS	32410	0.4404	0.2392	0	1
S	32410	13.8989	1.1848	8.1682	17.1111
P	32410	0.0962	0.0884	−1.0258	3.5468

TDR: Total debt ratio; LDR: long term debt ratio; SDR: short-term debt ratio; ETR: effective tax rate; NDTS: non-debt tax shields; GO: growth opportunities; AS: asset structure; S: size; P: profitability.

for the SMEs in our sample corresponds mainly to a short-term nature, exactly 85%. Note that, initially, this fact is consistent with our empirical hypothesis H8.

The average effective tax rate of Spanish SMEs is about 18%, which is clearly lower than the general tax rate that moves between 30 and 35% in the Spanish fiscal system, depending basically on the economic situation of companies. With respect to asset structure, we find that intangible assets represent over 3% of total assets value, whereas fixed assets represent about 44% of total assets. The mean of the natural logarithm of total assets over the period 1994–1998 indicates that the average size of SMEs wasapproximately 1,086,965 € in terms of assets, ranging from a 3,527 € minimum value to a 26,993,320 € maximum value. As far as profitability is concerned, the average return on assets

over the period of study mounts up to almost 10%, finding a great disparity between firms with a −103% minimum value to a 355% maximum value.

To examine the possible degree of collinearity among variables, we have obtained the correlation matrix of dependent and independent variables that we present in Table III.

As we observe in Table III, the correlation coefficients are not sufficiently large to cause collinearity problems in the regressions.

4. Econometric methodology and empirical results

The panel character of our data allows us to use a panel data methodology for our empirical research. This type of analysis can control firm heterogeneity, and reduce collinearity among the

TABLE III
Correlation matrix

	TDR	LDR	SDR	ETR	NDTS	GO	AS	S	P
TDR	1								
LDR	0.2868	1							
SDR	0.8295	−0.2971	1						
ETR	−0.1834	−0.2279	−0.0500	1					
NDTS	−0.1179	0.1492	−0.2945	−0.3901	1				
GO	0.0970	0.2763	−0.0644	−0.1539	0.2803	1			
AS	0.0466	0.2497	−0.0991	−0.2239	0.0986	−0.1637	1		
S	−0.1326	0.0458	−0.1588	0.0927	−0.0490	−0.0256	0.0278	1	
P	−0.1676	−0.0386	−0.1445	0.2694	0.0467	0.0341	−0.1311	−0.0403	1

TDR: Total debt ratio; LDR: long term debt ratio; SDR: short term debt ratio; ETR: effective tax rate; NDTS: non-debt tax shields; GO: growth opportunities; AS: asset structure; S: size; P: profitability.

variables that are contemplated (Arellano and Bover, 1990). Likewise, this technique enables us to eliminate the potential biases in the resulting estimates due to correlation between unobservable individual effects and the explanatory variables included in the study. Our panel data model may be represented as follows:

$$Y_{it} = X_{it} \cdot \beta + \eta_i + u_{it} \qquad (1)$$

where Y_{it} is the dependent variable, X_{it} is a 32410×6 matrix that contains all the explanatory variables, β is a 6×32410 matrix with the variable coefficients that we aim to estimate, η_i denotes the unobservable individual specific effect that is time-invariant,[12] and u_{it} is the random error, with i denoting firms (cross-section dimension) ranging from 1 to 6,482 and t denoting years (time-series dimension) ranging from 1 to 5.

To verify the character – fixed or random – of the unobservable individual effects, we use Hausman's (1978) specification test. Its outcome[13] enables us to reject the hypothesis regarding the absence of correlation between the unobservable effects and the explanatory variables and, thereby, we consider the individual effects as fixed.

It should be pointed out that some authors, such as Michaelas et al. (1999) have based their fixed-random choice upon a more intuitive reasoning, rejecting one of the options only when the sample was supposed to represent the whole economy of a country. However, there is neither an economical nor econometrical reason to consider a priori one of the cited effects. Therefore, if we do not apply this testing methodology we could lose statistical efficiency in the estimation stage.

Once we carry out the regression analysis, we find the following empirical results that are reported in Table IV.

A general look at the results illustrates that almost all the correlations between variables are highly statistically significant (the exceptions are ETR and S with SDR); besides the F joint test underlines the need to consider all the variables from a statistical viewpoint.

The two proxy variables that have to do with the fiscal approach of the TOT show mixed evidence. On the one hand, the effective tax rate appears to have a significant negative relation with firm leverage which indicates that H1 is rejected. One of the possible explanations of the sign of this effect could be reverse causation between taxes and the firm leverage variable. In this case, companies with a higher debt level would pay fewer taxes. But perhaps, alternatively, SME managers do not try to reduce their fiscal commitment through debt, because they employ other devices to achieve this goal such as the ones included in H2.

Michaelas et al. (1999) obtain this same sign in the relation, although theirs turn out not to be statistically significant to a 5% confidence level. Jordan et al. (1998) also find a negative relationship, explained by the fact that taxes only

TABLE IV
Regression results

	TDR	LDR	SDR
ETR	– 0.114 (13.95)**	– 0.098 (13.05)**	– 0.016 (1.68)
NDTS	– 0.681 (24.61)**	– 0.252 (9.92)**	– 0.429 (13.20)**
S	0.044 (27.75)**	0.041 (28.63)**	0.002 (1.27)
GO	0.135 (10.90)**	0.435 (38.30)**	– 0.300 (20.63)**
AS	0.022 (4.44)**	0.114 (24.59)**	– 0.091 (15.42)**
P	– 0.154 (17.22)**	– 0.034 (4.09)**	– 0.121 (11.47)**
R^2	0.0833	0.1097	0.0334
F (p-value)	392.55 (0.0000)	532.25 (0.0000)	149.10 (0.0000)
Number of obs.	32410	32410	32410

Absolute value of t-statistics in parentheses; *denotes statistically significant at 5% and **Significant at 1%.
TDR: Total debt ratio; LDR: long term debt ratio; SDR: short term debt ratio; ETR: effective tax rate; NDTS: non-debt tax shields; S: size; GO: growth opportunities; AS: asset structure; P: profitability.

influence debt as a result of their effect over retained earnings.

On the other hand, alternative tax shields seem to be negatively related to debt. This fact provides empirical support for H2, which is obviously accepted, and shows evidence for the controversial DeAngelo and Masulis (1980) hypothesis in the small firm sector.

As revealed in Table IV, size is positively related to debt, which suggests that this variable determines firm leverage not only for larger firms but also among SMEs. H3 is thus accepted. Regarding the decompositional analysis of debt, we observe positive relationships between size and both long term debt and short term debt, although in this latter case not statistically significant. Larger firms seem to employ more debt independently of its expiration, perhaps because they can hold a greater bargaining power towards creditors. Consequently, hypothesis 5-a is accepted but hypothesis 5-b is not confirmed.[14]

SMEs with more growth opportunities include more debt in their capital structures which leads us to accept H4.[15] Nevertheless, a significant negative correlation appears between the ratio of intangible assets over total assets and short term debt, which may evidence the different time nature of this type of assets and liabilities, leading us to reject H4-a and H4-b.

As was hypothesized, we find that asset structure is positively related to firm total leverage and so we accept hypothesis 6. Remember that SMEs are more likely to suffer from moral hazard and adverse selection problems, therefore the collateral value of their assets could help to reduce this sort of problems.

As can be seen from Table IV the relationship between leverage and asset structure changes significantly depending on the type of leverage ratio used. Specifically, we find that long term debt ratio is positively correlated with asset structure, while this correlation becomes negative if we consider short term debt ratio. The same result is obtained by Van der Wijst (1989), Van der Wijst and Thurik (1993), Chittenden et al. (1996), and Hall et al. (2000).

The asset structure variable measures the ratio of tangible to total assets, made up mainly by fixed assets which tend to be long term in nature. The negative correlation between asset structure

and short-term debt ratio means that short-term debt (current liabilities) is used to finance non-fixed assets, consisting basically current assets. These results confirm the so-called maturity matching principle, and lead us to accept H6-a.

Finally, the negative coefficient on profitability implies evidence for the Pecking Order Theory, where more profitable SMEs tend to use lesser debt when financing their activity. Hypothesis 7 is accepted and SMEs prefer internal resources to external ones as mode of financing.

In short, we present in Table V, both expected and actual relationships between the explanatory variables and the dependent variable of our model of capital structure [1].

5. Conclusions

Some researchers have pointed out that financial policy in SMEs can be explained by the most known capital structure theories. In order to shed some light on this question and to get a more thorough understanding of the underlying forces that drive capital structure decisions in the SME sector, in this paper we have tested some empirical hypotheses, based on different financing decision approaches, over a panel of 6,482 non financial Spanish SMEs during 1994–1998.

We both confirm some prior findings using an alternative more complete data set and extend the analysis using additional firm characteristics such as non-debt tax shields, and a decompositional analysis of firm leverage.

In the first place, we find leverage to be significantly negatively related to alternative tax shields

TABLE V
Summary of the relations obtained for the capital structure model [1]

Explanatory variable	Expected relation	Actual relation
ETR	+	−
NDTS	−	−
S	+	+
GO	+	+
AS	+	+
P	−	−

ETR: Effective tax rate; NDTS: non-debt tax shields; S: size; GO: growth opportunities; AS: asset structure; P: profitability.

like depreciation, which may seem to confirm DeAngelo and Masulis (1980) theory when applied it to SMEs. Contrary to expectations, we observe that taxes are negatively related to debt. Perhaps, this may be due to the fact that higher corporate tax rates would result in lower internal funds as well as higher cost of capital. Hence, fixed capital formation and demand for external funds would decrease, implying an inverse relationship between the level of debt and the effective tax rate.

Second, size and asset structure are both positively correlated with firm debt level, as stated by the theory. However, regarding asset structure we obtain a positive correlation with long term debt level but negative with short-term debt level. This may evidence the maturity matching principle in SMEs, where they try to finance their fixed assets with long term debts, and their current assets with short-term debts.

Third, SMEs with more growth options seem to employ more debt, although this relationship becomes negative with short-term debt. This fact may suggest that these kinds of assets are linked to a long-term nature, and thus their financing should match it.

Finally, predictions of Pecking Order Theory seem to explain debt policy in SMEs relatively well, although the underlying justification of this theory in our case may resemble manager's propensity to not losing part of their control in the firm. Put another way, the financing of SMEs relies on internal resources instead of external means.

Overall, Spanish SMEs show a financial behavior that resembles that of their counterparts in other developed countries. Nevertheless, there is still much work left especially in the fiscal context where it is necessary to carry out an independent investigation to elucidate the true relationships between the fiscal factors and firm financing policy

Regarding the future lines of research on SMEs capital structure, the study will improve by considering a broader time period analysis in order to elucidate whether capital structure in this sort of companies changes during different economic cycles. Furthermore, the analysis could be enriched by taking a dynamic look to the issue and formulating dynamic models of debt policy with instrumental variables.

Acknowledgements

Appendix

TABLE A.1
Dependent variables description

Total debt ratio (TDR)	$\frac{\text{Total debt}}{\text{Total assets}}$
Long term debt ratio (LDR)	$\frac{\text{Long term debt}}{\text{Total assets}}$
Short term debt ratio (SDR)	$\frac{\text{Short term debt}}{\text{Total assets}}$

TABLE A.2
Explanatory variables description

Effective tax rate (ETR)	$\frac{\text{Taxes}}{\text{EAIBT}}$, where EAIBT denotes Earnings after interest and before taxes
Non-debt tax shields (NDTS)	$\frac{\text{Depreciation}}{\text{Total assets}}$, where depreciation is taken as a flow variable
Growth opportunities (GO)	$\frac{\text{Intangible assets}}{\text{Total assets}}$
Asset structure (AS)	$\frac{\text{Tangible assets}}{\text{Total assets}}$
Size (S)	Natural logarithm of total assets
Profitability (P)	$ROA = \frac{\text{EBIT}}{\text{Total assets}}$, where EBIT denotes earnings before interest and taxes

Notes

[1] For example, Bradley et al. (1984), Titman and Wessels (1988), Mato (1990), Rajan and Zingales (1995), Graham (1996), Shyam–Sunder and Myers (1999), Miguel and Pindado (2001) and Fama and French (2002).

[2] Namely, perfect capital markets, no taxes, and absence of agency and transactions costs.

[3] Graham (1996) found a positive relation between firm size and taxes, which implies that SMEs have lower tax rates.

[4] Note however, as Rajan and Zingales (1995) state, that size may also be a proxy for the information outside investors have, which should increase their preference for equity relative to debt.

[5] According to Barclay and Smith (1999), when firms with high growth opportunities use debt financing, they will prefer short term debt or debt with few restrictive covenants instead of long term debt, in order to maintain their financial flexibility.

[6] In his revised version of the pecking order theory applied to SMEs, Ang (1991) establishes that the second financing resource for SMEs, after retained profits, will be funds supplied by the present firm shareholders.

[7] Recommendation 96/280/EC, April 3, 1996.

[8] Nowadays, this database is called SABI (*Sistema de Análisis de Balances Ibéricos*) as it has extended its firm coverage in 2002 (32nd version) including about 18,000 Portuguese firms.

[9] As the SABE database was created in 1992, its firsts two years of performance are not very complete in terms of firm data, so we preferred to begin our study from 1994 onwards in order to use a greater quantity and better quality information.

[10] For instance, López and Aybar (2000) consider only 445 SMEs with 1 year (1995) of observations and although Michaelas et al. (1999) analyze about 3500 SMEs over a 10 year period, they do not have at their disposal firm information for the whole period of time, taking into account less than 2000 companies for some of the years of study.

[11] See, for example, Rajan and Zingales (1995), Graham (1996), Shyam-Sunder and Myers (1999), Bevan and Danbolt (2000a), Bevan and Danbolt (2000b), Miguel and Pindado (2001), and Fama and French (2002).

[12] In our study we could associate this effect to the unobservable entrepreneurial or managerial skills of the firm's executives.

[13] The test statistics for the model with TDR, LDR and SDR as dependent variables are 1873.10, 698.61, and 677.64, respectively. All these statistics are asymptotically χ^2 distributed with 6 degrees of freedom, and have a p-value of 0.0000.

[14] Bevan and Danbolt (2000b) get similar results, and they only accept our hypothesis 5-b for bank debt.

[15] Michaelas et al. (1999) and Aybar et al. (2001), obtain a significant positive relationship between growth opportunities and debt, the same as Chittenden et al. (1996) and Jordan et al. (1998), although these latter not statistically significant.

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