Corporate debt policy of small firms: an empirical (re)examination

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Keywords

Capital, Structures, Information, Small firms

Abstract

The capital structure decision can be considered a difficult problem for academics as well as for managers. Corporate debt policy has been studied in the context of both large and small firms in developed countries, but comparatively less developed countries have received much less attention in the literature. This is particularly true in the case of medium income economies with an above average weight of financial intermediaries. This paper tests the factors affecting the capital structure decision of small firms in one such country. The pooled time series cross-section regression estimates for 995 firms and four years, suggests variables such as taxes, bankruptcy costs, size, collateral, age and growth opportunities affect the capital structure decisions of small firms. These findings have significant implications, both at the firm level and for the support of policies that redefine the financial infrastructure that may foster the emergence of local entrepreneurs in these economies.

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Managerial and policy implications

- There is no simple answer to the corporate debt policy of small firms in less developed markets with an overweight of financial intermediaries.
- In less developed markets with an overweight of financial intermediaries small firms depend largely on collateral to obtain long-term credit.
- Given the relative underdevelopment of some European capital markets and inadequacy of banking credit to finance risky ventures with capital constraints, innovative packages may be required to finance small firms.
- Specialised government agencies may be required to support small firms to secure finance, especially in light of the recent Basle II Accord that tends to suggest that banks may have to charge higher credit spreads to finance small firms.

Introduction

A long-standing issue that has concerned both academics and practitioners in finance relates to the optimal capital structure firms. Entrepreneurs can finance their firms through either equity or debt. The determination of the optimal capital structure is, however, not clear. Financing decisions have largely been analysed either within the context of perfect markets (Modigliani and Miller, 1958) or imperfect markets. If capital structure decisions are conceived in a world of perfect markets then these should not pose problems to entrepreneurs as the risk associated with financing can be diversified away. However, imperfections are inherent to market operations and it is generally contended that these may turn out to be particularly acute in the context of small firms. One of the reasons stems from the non-separation of ownership and control and non-existence of a market control mechanism magnifying the information asymmetry given the weak participation of small firms in capital markets. In this context, the formulation of questions regarding the existence of an optimal capital structure, or rather, the level of appropriate

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debt *vis-à-vis* contracted conditions, types and sources, seems relevant. The implications thereof are immediately distinct, whether dealing with small or large firms with capital held by thousands of shareholders and listed on the stock market.

The few results obtained through empirical investigation are not very conclusive. While some researchers (Norton, 1990; Constand *et al.*, 1991) conclude that the theories concerning capital structure developed with reference to large companies are not applicable to small firms; others (van Wijst and Thurik, 1993; Chittenden *et al.*, 1996 and Michaelas *et al.*, 1999) suggest that the determinants indicated by theory are applicable to small firms.

This paper is expected to update the existing studies with a data set of Portuguese small firms in a medium income economy. Portugal is typical of many less developed nations bearing an above average weight of financial intermediaries. Such an institutional set up raises significant barriers to the emergence of a buoyant entrepreneurial activity, more common in countries endowed with dynamic capital markets that facilitate the financing of small firms. This paper tests the explanatory power of the most relevant attributes the theory suggests as determining the capital structure when applied to debt to equity ratios observed in the Portuguese business context. The findings turn out to be relevant for defining capital structure within small firms and to set up a financial infrastructure to support small business. The paper is divided into four parts. The first part identifies the main attributes suggested by financial theory, leading to the definition of the research hypotheses and the model to be tested. The following section presents the data set and the methodology. The results are discussed in the penultimate section and the final section presents a summary and conclusions of the study.

Hypotheses and the model

The capital structure of a project in general (or a firm) more specifically, reflects the structure of financial sources used in the project (or in the firm). Funds used to keep the project going may be generated internally or externally. When raising funds externally, entrepreneurs should choose between issuing debt or equity. Most of the effort of the financial decision-making process is centred around the determination of the optimal capital structure of a firm. In other words, making the decision of the optimal of debt to equity ratio.The initial effort of Modigliani and Miller (1958, 1963) made a significant contribution to the understanding of the corporate debt policy. Essentially, they derived a set of propositions under stringent assumptions: the first proposition demonstrated that in the absence of taxes, the capital structure is irrelevant for determining the value of firms in equilibrium – in this state arbitrage profits are not allowed; hence levered and unlevered firms should have similar value. The second proposition demonstrated that the introduction of corporate taxes allowed firms to deduct interest on debt in computing taxable profits. This suggests that tax advantages derived from debt would lead firms to be completely financed through debt. The fact that this later proposition is not in accordance with stylised facts leads the authors themselves and others to argue for the relevance of bankruptcy costs. Corporate taxes associated with other costs could therefore explain observed debt to equity ratios (though later Miller (1977) observed that bankruptcy costs were too small to affect equilibrium).

Alternative explanations of the corporate debt policy have been developed within the context of agency theory – costs arising from the conflict of interests among agents involved in the decision; and theory of asymmetric information – costs arising from differential information held by agents involved in the decision. In general, debt holders, shareholders and management enter into negotiation for different reasons. Bringing them into agreement is costly in the sense that it is very difficult to reach a first-best solution. Negotiations have to be opened up to reach the second-best solution. The difference between the value of the firm under an ideal contracting situation and a non-ideal contracting situation is generally defined as an agency cost. An optimal corporate debt policy aims at minimising these costs. As the number of negotiators in the context of small firms is smaller, the effect of asymmetric information may be larger. This is the additional market imperfection that has been studied.

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Other fiscal benefits

In an initial phase, Modigliani and Miller (1958) argued that although interest was deductible from results for fiscal purposes, the value of a firm in the same class would not be proportional to results before interest and taxes but rather to the after-tax result. In a later article published in 1963, the authors recognised the tax effect, as interest-driven tax deduction depends on the level of firm debt.

Later, DeAngelo and Masulis (1980) showed that the fiscal advantage stemming from debt is limited. The higher the level of debt in the financial structure of the firm, the greater the likelihood that the result will be at a level where the fiscal protection generated by available benefits cannot be used. For small firms, the fiscal advantages of debt may turn out to be limited due to the higher spreads charged by banks to these firms in order to compensate for the higher risk level. Generally speaking, the risk perceived by banks when it comes to small firms is higher, due to stronger levels of asymmetric information in the negotiation process, higher information costs in undertaking project appraisal, difficulty in obtaining real assets as collateral, a higher degree of economic exposure due to a lower degree of diversification and strong dependence of the decisions on the entrepreneur (Scherr *et al.*, 1993).

Small firms also tend to operate in less concentrated markets, low capital intense business lines and subject to strong competition leading them to obtaining lower profit margins which, coupled with lower tax rates, lead to the conjecture that the fiscal advantage of debt may be reduced (McConnell and Pettit, 1984; Pettit and Singer, 1985). To all these factors, it should be added that entrepreneurs may tend to maintain control of their firms within the sphere of a family, thereby reducing the preference for debt in relation to equity as higher debt would lead to stronger surveillance by banks over their firms (Ang, 1992).

Based on this reasoning, the following hypothesis was formulated:

H1. There is a negative relationship between other fiscal benefits and the debt to equity ratio.

Variable 1

Is the ratio of the total depreciation over total net assets. This approach should compensate for the lack of information on investment credit and other available fiscal benefits (Kim and Sorensen, 1986; Constand *et al.*, 1991; van Wijst and Thurik, 1993; Homaifar *et al.*, 1994; Allen, 1995).

Economic risk

Firms in general are exposed to economic risk. This risk can be reduced through diversification. In the presence of more diversified activities, the risk of bankruptcy is limited (Remmers *et al.*, 1974; Warner, 1977; Ang *et al.*, 1982; Norton, 1990). Bankruptcy costs are relevant in the context of small firms as these tend to show a higher probability of failure (Altman, 1984), at least when compared to large firms. The specificity of small firms also tends to suggest that these may be prone to couple larger bankruptcy costs due to higher economic risk resulting from a lower degree of diversification (Ferri and Jones, 1979), lower capabilities in generating a high gross profit margin resulting from the higher fragmentation of the markets in which these tend to operate (Welsh and White, 1981) and higher volatility of sales resulting from intense competitive pressures (van Wijst, 1989).

Despite the broad consensus that those costs are an important determinant of corporate debt policy, empirical investigation has led to contradictory results, some indicating the existence of a negative relationship (Bradley *et al.*, 1984; Chung, 1993), and others showing a positive relationship (Toy *et al.*, 1974; Kim and Sorensen, 1986). These results can be justified by the difficulty of defining a variable that can measure this attribute (Thies and Klock, 1992). There are indeed numerous inherent difficulties associated to estimating both the level of such costs, particularly indirect costs, as Altman (1984) demonstrated, and the likelihood of bankruptcy. In an attempt to overcome these difficulties, some empirical inquiries have used either the volatility of profit or the volatility of sales as a proxy (Ferri and Jones, 1979; Kim and Sorensen, 1986; Titman and Wessels, 1988; Constand *et al.*, 1991; Michaelas *et al.*, 1999; Bowman, 2002), while other empirical inquiries have used the ratio of profit over total assets (Marsh 1982;

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Bradley *et al.*, 1984; Thies and Klock, 1992; Homaifar *et al.*, 1994). Both sets of inquiry have posited that these attributes are positively correlated to the probability that the results of a given period are insufficient to cover all costs.

Based on this reasoning, the following hypothesis is formulated:

H2. There is a negative relationship between economic risk and the debt to equity ratio.

Variable 2

This variable is measured as the sales variation coefficient (Pearson). The study of the relationship between bankruptcy costs and profit has merited criticism on the grounds that these proxies may be influenced by accounting practices, particularly when dealing with non-audited firms as for most small firms.

Size of business

As a firm recurs to debt it endows third parties (neither shareholders nor bondholders) with rights over the firm, should it face bankruptcy. Creditors who must support bankruptcy costs *ex post facto* tend to transfer this cost to shareholders beforehand by requiring higher remuneration rates. This is reflected in the cost of capital and, consequently, in the firm's value. In this context it is generally contended that the optimal capital structure of firms is achieved when the fiscal benefit of debt equals bankruptcy cost (Stiglitz, 1972; Kraus and Litzenberg, 1973; Kim, 1978; Brennan and Schwartz, 1978). Large firms have a comparative advantage in securing debt as they can recur to capital and obtain better credit ratings, thereby lowering the cost of their capital (Ferri and Jones, 1979). In the absence of debt the risk of bankruptcy is limited. But the market interprets this choice as a lack of efficient usage of capital leading to a fall in the value of the firm. In the presence of an incentive package linked to the value of the firm, management prefers debt to equity (Jensen and Meckling, 1976). Beyond an optimal threshold, the market penalises debt as it increases the probability of failure leading to a fall in the value of the firm. Under these latter circumstances the market forces management to be more efficient in order to improve the value of the firm (Harris and Raviv, 1988; Williamson, 1988; Stulz, 1988).

For equity-holders debt is preferred to equity as it dilutes their risk and also induces management to work in the interests of the firm. In this context the market exerts a disciplinary function over the management of the firm (Grossman and Hart, 1982). Based on this reasoning and following the general trend in the literature (Remmers *et al.*, 1974; Ferri and Jones, 1979; Titman and Wessels, 1988; Kim and Sorensen, 1986; van Wijst and Thurik, 1993; Chung, 1993; Chittenden *et al.*, 1996), the hypothesis is formulated as:

H3. There is a positive relationship between the scale of the firm and the debt to equity ratio.

Variable 3

In order to avoid any spurious effect associated with the measurement of the size of the firm this variable is measured as the logarithm of total net assets (Marsh, 1982; Constand *et al.*, 1991; Homaifar *et al.*, 1994).

Age of business

Before granting a loan, banks tend to evaluate the creditworthiness of entrepreneurs as these are generally believed to pin high hopes on very risky projects promising high profitability rates. In particular, when it comes to highly indebted companies, they are essentially gambling their creditors' money. If the investment is profitable, shareholders will collect a significant share of the earnings; but if the project fails, then the creditors have to bear the consequences (Myers, 1977). To overcome problems associated with the evaluation of creditworthiness Diamond (1989) suggests the use of firm reputation. He takes reputation to mean the good name a firm has built up over the years (historical) and which is understood by the market, which has observed its ability to meet its obligations in a timely manner. Directors concerned with a firm's reputation tend to act more prudently and avoid riskier projects in favour of safer projects, even when the latter have not been approved by shareholders, thus reducing debt agency costs (by reducing the "temptation" to gamble at creditors' cost).

This perspective has also been seconded within the context of small business (see Ang, 1991). The author sees the extension of firm risk to the personal area of the businessman (given the unlimited liability of entrepreneurs) to be a way of managing the agency costs resulting from cases of more opportunistic

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behaviour. Given the fragmentation of information, the high costs of control and evaluation, the firm and the entrepreneurs' reputation become a valuable asset in the management of relations between the principal (investor) and the agent (businessman), here also more informal (Landström, 1993):

H4. There is a positive relationship between the age of the firm and the debt to equity ratio.

Variable 4

Given that a firm's chosen projects cannot be observed *ex ante* by creditors, who can only rely on the *ex post* results, we use the variable age – measured by the number of years of firm life (van Wijst, 1989; Westhead and Storey, 1997; Michaelas *et al.*, 1999; Hall *et al.*, 2000).

Asset composition

Under-investment, or sub-optimal sizing, is one of the main problems that face firms in general. By growing to the point where self-financing capacity has been exhausted, firms need to diversify financing sources either by opening capital to outside investors or by securing further debt. While large-scale firms have, in general, access to capital markets to secure both equity and debt, this is not the case of small firms. The process of accessing to equity is extremely complex in this type of firm due to owners' aversion to sharing capital and management. This is accompanied by the absence of a financial market where the representative securities of small firms may be traded, raising agency costs once again (Cook, 2001).

Debt thus appears as the most viable solution, as Jensen and Meckling (1976) have demonstrated. Although a viable alternative, financing secured through debt also leads to high agency costs. This is a result of adverse selection – the financier does not have access to all the information retained by the entrepreneur – and moral hazard – inability of the financier to exert control over the behaviour of the agent.

Indeed, managerial responsibility is centralised by the entrepreneur or to a restricted number of individuals who exert control over the firm. They are, thus, more inclined to opportunism so as to maximise personal wealth, in detriment to the maximisation of firm value. In this context, the existence of assets that may be utilised as collateral, as Leeth and Scott (1989) and Stulz and Johnson (1985) have demonstrated, increases the probability of emission of collateralised debt. Through this mechanism, creditors transfer the costs of monitoring and control accrued by debt to the businessman.

The existence of a positive relationship between the composition of assets and the level of debt has been amply suggested in the literature. Higher collateral offered generates greater firm debt capacity. The concession of collateral reduces the under-investment problem in small firms by increasing the probability of obtaining credit – functioning also as a management instrument in conflicts between entrepreneur and financiers, since the degree of the entrepreneurs' involvement in sharing business risk, by granting personal collateral, is clearly evident:

H5. There is a positive relationship between the collateral value of the firm's assets and the debt to equity ratio.

Variable 5

This variable is measured as the ratio of net fixed assets over total net assets (Ferri and Jones, 1979; Marsh, 1982; Thies and Klock, 1992; Chung, 1993; Hall *et al.*, 2000).

Profitability

The information asymmetry between entrepreneurs and outside investors is one of the factors indicated by theory to justify the strong rationing of capital. This phenomenon is more accentuated in the case of small firms, both due to the cost of obtaining information and the reluctance of the businessmen to communicate with the market.

In this context, the mid-1980s witnessed a new trend, where firms started to prefer financing through internally generated funds. Where internal funds were insufficient, firms issued low-risk securities – debt and not equity – and external debt increased (firms reduce the peck), they accessed convertible debt and only then equity. According to Myers and Majluf (1984), this preference, as a hierarchy of sources, derives from the fact that the markets interpret new offerings as bad news (they are considered overvalued on the assumption that directors act to the benefit of current shareholders). This trend is more relevant the lesser the market's confidence in the firm – the rational market bias against new issues. Thus, smaller firms face greater difficulties in convincing the

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market, as new issues also imply the dilution of current shareholders' rights. From this perspective and according to Ross (1977), directors provide the market with information about future firm results by the greater or lesser use they make of debt.

Myers (1984) states that the most profitable companies are the ones that obtain debt least often. The amount of debt companies thus include in their financing structure is due more to the need to finance growth (depending on investment opportunities) and also to the desire to maintain some room for financial flexibility, than to the search for a normative capital structure. This logic suggests a negative relationship between debt and firm profitability.

The effect of profitability on the debt to equity ratio can be stated as:

H6. There is a negative relationship between profitability and the debt to equity ratio.

Variable 6

The variable used to measure the effect of business profitability on the financial structure was earnings before interest and tax over total assets or total revenues. This variable has been used for both large firms (Toy *et al.*, 1974; Titman and Wessels, 1988; Baskin, 1989) and small firms (Constand *et al.*, 1991; van Wijst and Thurik, 1993; Hall *et al.*, 2000; Bowman, 2002).

Growth

Firms need additional capital to finance growth. With this perspective in mind, Baskin (1989) used a sample of 378 US companies taken from among the 500 largest, with relevant accounting data referring to the years from 1965 to 1972. He empirically studied the effect of growth (measured by the coefficient of capital invested in 1972 over its value in 1965) over debt ratios. The result obtained is significantly positive, leading to the conclusion that capital structure is positively dependent on the need for investment resources, and that debt varies directly with growth whether or not an optimal capital structure exists.

Given the relevance of this issue to small firms, the following hypothesis is proposed:

H7. There is a positive relationship between recent growth and the debt to equity ratio.

Variable 7

This variable was measured as the rate of asset growth (van Wijst, 1989; Hall and Hutchinson, 1993; Michaelas *et al.*, 1999; Hall *et al.*, 2000).

Growth options

The capacity of a firm to generate future value depends on its assets. Within a broad class of assets many firms possess intangible assets such as technology, human resources, licenses, patents that allow it to innovate products, tap markets. Although these assets are quite difficult to value, they are generally believed to provide a firm with growth opportunities as well. In option theory these growth opportunities are viewed as growth options. The value of these options depends largely on the aptitude of the management team to exercise these at an appropriate time (Myers, 1977). Where firms are highly leveraged these growth options can significantly reduce bankruptcy costs as these benefit the creditors. In this context, it is largely believed that firms with growth options generally tend to register lower debt to equity ratios:

H8. There is a negative relationship between growth options and debt to equity ratios.

Variable 8

This variable was measured through the ratio of intangible assets over total assets as has been done previously in the context of large firms (Titman and Wessels, 1988) and small firms (Michaelas *et al.*, 1999; Scherr and Hulburt, 2001). The dependent variable was measured as the total debt to equity ratios and then decomposed according to the maturity of debt as long-term and short-term. The model can be stated in the form tested and with the sign of each coefficient representing the direction of the effect of each factor:

$$\begin{aligned}&\text{Debt to equity ratio} = \\ &a - b_1(\text{other fiscal benefits}) \\ &- b_2(\text{risk}) + b_3(\text{size}) + b_4(\text{age}) \\ &+ b_5(\text{asset composition}) - b_6(\text{profitability}) \\ &+ b_7(\text{growth}) - b_8(\text{growth options})\end{aligned}$$

Research data and methodology

In order to undertake the empirical test a relevant data set was obtained from the Portuguese Central Bank (Banco de Portugal). The data set includes only small

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manufacturing firms in order to ensure greater homogeneity. The period between 1992 and 1996 is analysed. To avoid measurement problems originated by occasional fluctuations, means of several parameters were computed to build the proxies used in the study. While the data set employed in this study relates to small firms in Portugal it can easily be extended to other markets and sectors. The original sample of 1,500 firms was reduced to 995 through a depuration process used in the standard econometric estimation statistical packages. The firms excluded from the population were technically bankrupt and exhibited a negative equity. Since firms in general require positive equity to pursue their activity (Scherr *et al.*, 1993; Scherr and Hulburt, 2001), the ones with negative equity were excluded (though the study of these excluded firms represents in itself a promising research area). The sample distribution by industry, according to the Portuguese classification by class of economic activity, is summarised in Table I.

It can be observed that industries such as textiles, wood and cork and metal products have a significant weight in the sample. These are also industries in which small Portuguese firms have sustained a competitive edge in world markets. Other industries such as chemicals and petroleum have a lower weight in the sample. The respective means and standard deviations of selected variables displayed in Table II show that small firms in Portugal finance roughly 40 per cent of their overall assets through equity and roughly 60 per cent of their overall assets through debt. A more intriguing issue relates to the use of long-term and short-term debt. Small firms in Portugal appear to depend largely on short-term debt (50 per cent) probably highlighting the difficulties of accessing long-term debt due to less developed capital markets (Petersen and Shulman, 1987). Table III shows the correlation matrix between the independent variables used to test the model. As can be observed from the table, the independent variables are not sufficiently correlated to cause significant multicollinearity problems in the regression analysis.

Table I Industry distribution in the sample

SIC – codes	Sample Number	%
31 – Food, beverages and tobacco	101	10.2
32 – Textile, clothing and leather	218	21.9
33 – Wood and cork manufacturing	130	13.1
34 – Paper, printing, and publishing	80	8.1
35 – Chemical, oil products, coal, rubber and plastics	79	7.9
36 – Non-metal minerals, excluding oil and coal	72	7.2
37 – Base metallurgic industries	7	0.7
38 – Metal products, machinery and transport equipment	290	29.1
39 – Other manufacturing industries	18	1.8
Total	995	100

This study uses a time series of cross-sections to analyse the effect of several attributes on the debt to equity ratio. A pooled time-series cross-section analysis increases the sample and hence the reliability of regression parameters. Given the existence of observations on I firms over T years, the basic model is as follows:

$$\text{Debt to equity ratio} = \alpha_{it}\beta_1(\text{other fiscal benefits})_{it} - \beta_2(\text{economic risk})_{it} + \beta_3(\text{size})_{it} + \beta_4(\text{age})_{it} + \beta_5(\text{asset composition})_{it} - \beta_6(\text{profitability})_{it} + \beta_7(\text{growth})_{it} - \beta_8(\text{growth options})_{it} + \varepsilon_{it}$$

where ε is stochastic disturbance, α is the constant and the β_s are the regression parameters. The signs reflect the expected relationship between the dependent and independent variables.

Empirical findings

The empirical results are reported in Table IV. The regressions proved to be statistically significant for all the dependent variables employed in the test. Broadly speaking, the results conform to results obtained in previous studies both in the context of large firms (Thies and Klock, 1992; Chung, 1993) and small firms (Constand *et al.*, 1991; Chittenden *et al.*, 1996; Michaelas *et al.*, 1999; Hall *et al.*, 2000).

The result obtained with the variable for other fiscal benefits beyond the debt confirm *H1*, conforming to DeAngelo and Masulis' (1980) suggestion that the increase of non-debt-related fiscal benefits is associated to lower firm debt. Lack of statistical significance for short-term debt may be explained by the temporary nature of deficits covered by short-term debt lowering the importance of purely fiscal considerations concerning this type of debt.

Table II Means and standard deviations of dependent and independent variables

Variables	Total	Year 1993	1994	1995	1996
Y_1 – Total debt	0.58 (0.23)	0.58 (0.23)	0.58 (0.21)	0.57 (0.22)	0.57 (0.23)
Y_2 – Medium/long term debt	0.08 (0.12)	0.08 (0.13)	0.07 (0.11)	0.07 (0.10)	0.08 (0.13)
Y_3 – Short term debt	0.50 (0.24)	0.50 (0.24)	0.51 (0.23)	0.50 (0.23)	0.49 (0.24)
Other fiscal benefits	0.06 (0.06)	0.07 (0.06)	0.09 (0.07)	0.07 (0.05)	0.07 (0.06)
Economic risk	0.12 (0.12)	0.12 (0.12)	0.13 (0.12)	0.12 (0.12)	0.11 (0.11)
Size	5.13 (0.74)	5.09 (0.75)	5.14 (0.73)	5.17 (0.74)	5.19 (0.74)
Age	21.8 (66.03)	20.4 (59.8)	21.4 (59.8)	22.4 (59.8)	25.4 (86.5)
Asset composition	0.34 (0.20)	0.34 (0.20)	0.35 (0.20)	0.34 (0.20)	0.32 (0.20)
Profitability	0.05 (0.15)	0.05 (0.15)	0.05 (0.14)	0.05 (0.15)	0.05 (0.15)
Growth	0.10 (0.30)	0.09 (0.28)	0.17 (0.43)	0.07 (0.22)	0.08 (0.22)
Growth options	0.01 (0.03)	0.01 (0.04)	0.01 (0.04)	0.01 (0.03)	0.01 (0.03)

Table III Correlation matrix of variables in the data set

Variables	Y_1	Y_2	Y_3	O.F. Ben.	E. Risk	Size	Age	Asset C.	Profit	Growth	G. options
Y_1	1.00										
Y_2	0.10**	1.00									
Y_3	0.91**	–0.31**	1.00								
O.F. Ben.	–0.09**	0.05	–0.11**	1.00							
E. Risk	0.28**	0.06	0.24**	0.01	1.00						
Size	–0.34**	0.23**	–0.42**	–0.15**	–0.08**	1.00					
Age	–0.32**	–0.03	–0.29**	–0.17**	–0.19**	0.37**	1.00				
Asset C.	–0.25**	0.37**	–0.39**	0.51**	–0.03	0.22**	–0.03**	1.00			
Profit	–0.14**	–0.06	–0.12**	0.03	–0.02	0.14**	–0.06*	–0.06**	1.00		
Growth	0.26**	0.05	0.24**	0.11**	0.31**	–0.11**	–0.22**	–0.03	0.09**	1.00	
G. options	0.01	0.01	0.01	0.02	0.03	0.00	–0.01	0.10	–0.02	0.01	1.00

Notes: * Statistically at 5% level of significance; ** Statistically at 1% level of significance

A negative relationship between risk and debt to equity ratios could not be confirmed. Surprisingly, the sign of the regression coefficient proved to be positive. This result may reflect the difficulty associated with measuring economic risk in the strict sense. Indeed, the literature shows a general lack of unanimity in the definition of the appropriate variable to measure bankruptcy costs and its effect on the capital structure. The positive and statistically-significant relationship with short-term debt may be explained by the positive association between the economic impact of small activity variations and leverage of the firm. This higher risk may leave the indebted small firm little choice but to demand short-term debt (Sherr and Hulburt, 2001). This reasoning is confirmed from the analysis of the size variable. Small firms may seek short-term financing more often than other firms due to their specific risk premium, enhanced by the lower diversification lower liquidity of their securities.

The results of this study show a strong relationship between asset composition and long-term debt. As the risk associated to the investment in small firms is higher than the market's mean, these firms are required to provide more valuable collateral as they recur to external sources of financing. As the assets substitution effect is stronger within small firms the owner has greater discretion, leading to higher monitoring costs by banks and other suppliers of external financing. This leads these institutions to require more valuable collateral rather than concentrating on accounting information, including income statements. The variable age showed a negative sign (a positive sign was expected) but a statistically-significant relationship. Westhead and Storey (1997) also found similar findings. This result can be interpreted within the context of the pecking order

Table IV Regression coefficients

Independent variables	Dependent variables γ_1 Total debt	γ_2 Medium long term debt	γ_3 Short term debt	Ratio[a]
Other fiscal benefits	−0.248421	−0.177526	−0.070895	
σ	0.077220	0.043211	0.061119	
t-statistic	−3.217067**	−4.108355**	−1.159953	0.4
Economic risk	+0.256268	+0.020073	+0.236196	
σ	0.030229	0.017660	0.027881	
t-statistic	8.47755**	1.136605	8.471663**	11.8
Size	−0.076807	0.015215	−0.092022	
σ	0.005170	0.002805	0.004703	
t-statistic	−14.85698**	5.425361**	−19.56772**	6.1
Age	−0.000066	−0.000041	−0.000026	
σ	0.000127	0.000013	0.00005	
t-statistic	−0.518759	−3.100795**	−0.521423	0.6
Asset composition	−0.112966	0.165789	0.278755	
σ	0.020478	0.012877	+0.019004	
t-statistic	−5.516523**	12.87439**	−14.66833**	1.7
Profitability	−0.207875	−0.055703	−0.152172	
σ	0.031849	0.012857	0.022376	
t-statistic	−6.526967**	−4.332573**	−6.800543**	2.7
Growth	+0.104949	0.004172	+0.100777	
σ	+0.022953	0.006744	0.011008	
t-statistic	+4.572418**	0.618706	9.154861**	24.2
Growth options	−0.05239	+0.016867	−0.069264	
σ	0.106157	+0.047638	0.096038	
t-statistic	−0.493581	0.354071	−0.721223	4.1
Constant	0.997049	−0.044558	1.045607	
σ	0.028034	+0.014381	0.024756	
t-statistic	35.5628*	−3.098371*	42.07427*	
Adj. coeff. ($\bar{R}^2$)	16.5%	8.5%	22.6%	
F statistic	98.93336**	47.10500**	145.6666**	

Notes: [a] The ratio of the variable effect on short term debt ratio to the variable effect on the long-term debt ratio (i.e. regression coefficient in short term debt model to regression coefficient in the long term model)
* Statistically at a 5% level of significance; ** Statistically at a 1% level of significance

theory. Older and more experienced firms require less external financing as they can rely more on internally generated funds during previous exercises.

The significant negative relation obtained between profitability and debt to equity ratios confirms the hypothesis that less profitable firms are more prone to needing external financing. A positive relationship between growth and debt to equity ratios was confirmed through the empirical test. As Pinegar and Wilbricht (1989) and Baskin (1989) suggested, small firms, generally lacking sufficient internally-generated funds, must apply to external sources of financing. New equity emission may not be available and generate a negative signal to the market (Myers and Majluf, 1980). Stronger information asymmetry, especially during the first offering undervalues the securities of small firms leading to a dilution of the value for former shareholders. Furthermore, in many Portuguese small firms the owners resist the sharing of both ownership and control. The relationship between growth options and debt to equity ratios proved to be positive but statistically speaking non-significant (see also Sherr and Hulburt, 2001).

In order to evaluate the effect of industry on corporate debt policy a one-way analysis of variance test was undertaken (Table V). The Bonferroni test was employed for the years 1994 and 1996, as these years showed homogeneity of variance (Table VI and VII), whereas the Tamhane test was employed for

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Table V Analysis of variance

	Y_1 Total debt	Y_2 Long-term debt	Y_3 Short-term debt
Computed F-ratio			
1993	2.107	0.654	2.605
1994	2.607	1.044	2.681
1995	2.849	0.840	2.868
1996	2.836	1.263	3.096
Degrees of Freedom	993	993	993
Critical F-ratio			
1 per cent level	2.529	2.529	2.529
5 per cent level	1.948	1.948	1.948

the years 1993 and 1996 as these did not show homogeneity of variance (Tables VIII and IX). The results show that industry plays a significant role only for total and short-term debt (Hall *et al.*, 2000). The results confirm significant differences between the means obtained for the ratios of total debt of industries with SIC 33 – wood and cork manufacturing, SIC 35 – chemical, oil products, coal, rubber and plastics and SIC 36 – non-metal minerals, excluding oil and coal. For short-term debt, significant differences between the means can be observed for SIC 33, 35 and 36, as well as

Table VI Bonferroni test for total debt model

			1994			1996		
Test	(I) SIC	(J) SIC	Mean diff. (I-J)	Std. error	Sig.	Mean diff. (I-J)	Std. error	Sig.
Bonferroni	31	32	–0.012764	0.025590	1.00	–0.020728	0.027641	1.00
		33	–0.048966	0.028267	1.00	–0.053921	0.030502	1.00
		34	–0.010077	0.031842	1.00	–0.002535	0.034400	1.00
		35	0.053461	0.032069	1.00	0.066126	0.034776	1.00
		36	0.053671	0.032815	1.00	0.011535	0.035607	1.00
		37	–0.007634	0.083154	1.00	0.072391	0.084724	1.00
		38	–0.028445	0.024592	1.00	–0.031101	0.02647	1.00
		39	–0.064732	0.053202	1.00	–0.136721	0.057634	0.644
	32	31	0.023764	0.025590	1.00	0.020728	0.027641	1.00
		33	–0.036202	0.023613	1.00	–0.033192	0.025686	1.00
		34	0.002687	0.027794	1.00	0.018193	0.030212	1.00
		35	0.026623	0.028053	0.664	0.086855	0.030638	0.168
		36	0.066435	0.028903	0.783	0.032263	0.031579	1.00
		37	0.005130	0.081689	1.00	0.093120	0.083111	1.00
		38	–0.015681	0.019061	1.00	–0.010372	0.020747	1.00
		39	–0.051968	0.050882	1.00	–0.115992	0.052381	1.00
	33	31	0.048966	0.028267	1.00	0.053921	0.030502	1.00
		32	0.036202	0.023613	1.00	0.033192	0.025686	1.00
		34	0.038888	0.030279	1.00	0.051386	0.032850	1.00
		35	**0.102427***	0.030516	0.029	**0.120047***	0.033243	0.012
		36	**0.102637***	0.031297	0.039	0.065456	0.034111	1.00
		37	0.041332	0.082566	1.00	0.126313	0.084106	1.00
		38	0.020520	0.022528	1.00	0.022820	0.024429	1.00
		39	–0.015766	0.052280	1.00	–0.082799	0.056724	1.00
	34	31	0.010077	0.031848	1.00	0.002535	0.034400	1.00
		32	–0.002687	0.027793	1.00	–0.018193	0.030212	1.00
		33	–0.038888	0.030277	1.00	–0.051386	0.032850	1.00
		35	0.063538	0.033854	1.00	0.068661	0.068526	1.00
		36	0.063748	0.034561	1.00	0.014701	0.037637	1.00
		37	0.002443	0.083857	1.00	0.074926	0.085597	1.00
		38	–0.018368	0.026878	1.00	–0.028566	0.029151	1.00
		39	–0.054655	0.054297	1.00	–0.134186	0.058912	0.826

(continued)

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Table VI

Test	(I) SIC	(J) SIC	1994 Mean diff. (I-J)	1994 Std. error	1994 Sig.	1996 Mean diff. (I-J)	1996 Std. error	1996 Sig.
	35	31	–0.053461	0.032069	1.00	–0.066126	0.034776	1.00
		32	–0.066226	0.028053	0.664	–0.086855	0.036387	0.168
		33	**–0.102427***	0.030515	0.029	**–0.120047***	0.033243	0.012
		34	–0.063538	0.033854	1.00	–0.068661	0.036852	1.00
		36	0.000209	0.034770	1.00	–0.054591	0.037981	1.00
		37	–0.061096	0.083944	1.00	0.006265	0.085749	1.00
		38	–0.081907	0.027146	0.094	**–0.097227***	0.029594	0.038
		39	–0.118193	0.054430	1.00	**–0.202847***	0.059132	0.023
	36	31	–0.053671	0.032815	1.00	–0.011535	0.035607	1.00
		32	–0.066435	0.028903	0.783	–0.032264	0.031579	1.00
		33	**–0.102637***	0.031298	0.039	–0.065456	0.034111	1.00
		34	–0.063745	0.034561	1.00	–0.014070	0.037638	1.00
		35	–0.000209	0.034770	1.00	0.054591	0.037981	1.00
		37	–0.061305	0.084319	1.00	0.060856	0.086089	1.00
		38	–0.082117	0.028023	0.125	–0.042636	0.030566	1.00
		39	–0.118403	0.054873	1.00	–0.148256	0.059624	0.47
	37	31	0.007634	0.083155	1.00	–0.072391	0.084724	1.00
		32	–0.005130	0.081688	1.00	–0.093120	0.083111	1.00
		33	–0.041332	0.082566	1.00	–0.126313	0.084106	1.00
		34	–0.002443	0.083857	1.00	–0.074926	0.085597	1.00
		35	0.061096	0.083944	1.00	–0.006265	0.085748	1.00
		36	0.061305	0.084232	1.00	–0.060856	0.086089	1.00
		38	–0.020811	0.081382	1.00	–0.103492	0.082732	1.00
		39	–0.057098	0.094067	1.00	–0.209113	0.097290	1.00
	38	31	0.028445	0.024592	1.00	0.031101	0.026478	1.00
		32	0.015681	0.019060	1.00	0.010372	0.020747	1.00
		33	–0.020525	0.022528	1.00	–0.022820	0.024429	1.00
		34	0.018368	0.026878	1.00	0.028566	0.029151	1.00
		35	0.081907	0.027145	0.094	**0.097227***	0.029594	0.038
		36	0.082117	0.028023	0.125	0.042636	0.030565	1.00
		37	0.020811	0.081382	1.00	0.103493	0.082732	1.00
		39	–0.036286	0.050388	1.00	–0.105620	0.054664	1.00
	39	31	0.064732	0.053202	1.00	0.136721	0.057635	0.644
		32	0.051968	0.050882	1.00	0.115992	0.052381	1.00
		33	0.015766	0.052280	1.00	0.082800	0.056724	1.00
		34	0.054655	0.054296	1.00	0.134186	0.058912	0.826
		35	0.118193	0.544303	1.00	**0.202847***	0.059132	0.023
		36	0.118403	0.054873	1.00	0.148256	0.059624	0.470
		37	0.057098	0.094067	1.00	0.209113	0.097290	1.00
		38	0.036287	0.050388	1.00	0.105620	0.054665	1.00

SIC 36 and SIC 38 – metal products, machinery and transport equipment. Industry-based homogeneous groups were identified using a new variance analysis, now excluding some groups of firms. After excluding firms belonging to SIC 33 and 38 and those belonging to SIC 35 and 36, the means obtained for both total debt and short-term debt proved to be not significantly different. It can thus be observed that firms belonging to SIC 33 and 38 have higher debt levels in relation to the mean and firms belonging to SIC 35 and 36 have debt levels below the mean.

Table VII Tamhane test for total debt model

			1993			1995		
Test	(I) SIC	(J) SIC	Mean diff. (I-J)	Std. error	Sig.	Mean diff. (I-J)	Std. error	Sig.
Tamhane	31	32	0.000374	0.028007	1.00	–0.027133	0.026232	1.00
		33	–0.035505	0.030938	1.00	–0.064454	0.028976	0.782
		34	0.024754	0.034709	1.00	–0.038400	0.032642	1.00
		35	0.064912	0.035228	0.980	0.048722	0.032994	0.999
		36	0.066178	0.035915	0.950	0.029913	0.033504	1.00
		37	0.057993	0.091009	1.00	0.029423	0.085240	1.00
		38	–0.013184	0.026915	1.00	–0.045830	0.025209	0.960
		39	0.0094809	0.058228	1.00	–0.083449	0.054537	0.997
	32	31	–0.000374	0.028007	1.00	0.027133	0.026232	1.00
		33	–0.358791	0.025843	0.995	–0.037321	0.024205	0.995
		34	0.024380	0.030282	1.00	–0.011262	0.028491	1.00
		35	0.064538	0.030850	0.675	0.072005	0.028895	0.336
		36	0.065804	0.031633	0.412	0.057046	0.029475	0.784
		37	0.057618	0.089406	1.00	0.056557	0.083738	1.00
		38	–0.013559	0.020861	1.00	–0.018697	0.019539	1.00
		39	–0.009854	0.055689	1.00	–0.563163	0.052160	1.00
	33	31	0.035505	0.039380	1.00	0.064454	0.028977	0.782
		32	0.035879	0.025843	0.995	0.037321	0.024205	0.995
		34	0.060259	0.033010	0.958	0.026058	0.031036	1.00
		35	0.100417	0.033533	0.070	**0.109326***	0.034107	0.026
		36	**0.101684***	0.034254	0.023	0.094367	0.031942	0.107
		37	0.093498	0.090366	0.989	0.093877	0.084638	0.941
		38	0.022320	0.024656	1.00	0.018623	0.023093	1.00
		39	0.026024	0.057219	1.00	–0.018995	0.053592	1.00
	34	31	–0.024754	0.034731	1.00	0.038396	0.032642	1.00
		32	–0.024380	0.030282	1.00	0.011262	0.028491	1.00
		33	–0.060260	0.033010	0.958	–0.026058	0.031036	1.00
		35	0.040157	0.037061	1.00	0.083268	0.034818	0.636
		36	0.041452	0.037715	1.00	0.068308	0.035300	0.922
		37	0.033238	0.091745	1.00	0.067819	0.085962	1.00
		38	–0.037939	0.029275	1.00	–0.007434	0.027552	1.00
		39	–0.034236	0.059356	1.00	–0.045054	0.055659	1.00
	35	31	–0.064912	0.035228	0.980	–0.044872	0.032995	0.999
		32	–0.064538	0.030850	0.675	–0.07226	0.028895	0.336
		33	–0.100417	0.033533	0.070	**–0.109326***	0.031407	0.026
		34	–0.041576	0.037061	1.00	–0.083268	0.034817	0.636
		36	0.001266	0.038173	1.00	–0.014959	0.035627	1.00
		37	–0.006919	0.091924	1.00	0.015449	0.086097	1.00
		38	–0.078097	0.029863	0.245	**–0.090703***	0.027969	0.036
		39	–0.074393	0.059648	1.00	–0.128321	0.055867	0.697
	36	31	–0.066178	0.035915	0.950	–0.029913	0.033503	1.00
		32	–0.065804	0.031633	0.412	–0.057046	0.029474	0.784
		33	**–0.101684***	0.034254	0.023	–0.094367	0.031941	0.107
		34	–0.041424	0.037715	1.00	–0.068309	0.035300	0.922
		35	–0.001266	0.038173	1.00	0.014959	0.035627	1.00
		37	–0.008185	0.092189	1.00	–0.000489	0.086293	1.00
		38	–0.079363	0.030670	0.090	–0.075743	0.028568	0.171
		39	–0.075659	0.060056	1.00	–0.113362	0.561679	0.876

(continued)

Table VII

			1993			1995		
Test	(I) SIC	(J) SIC	Mean diff. (I-J)	Std. error	Sig.	Mean diff. (I-J)	Std. error	Sig.
	37	31	–0.057993	0.091009	1.00	–0.029423	0.085240	1.00
		32	–0.057619	0.089406	1.00	–0.056557	0.083738	1.00
		33	–0.093498	0.090366	0.989	–0.093877	0.084638	0.941
		34	–0.032383	0.091734	1.00	–0.067819	0.085962	1.00
		35	0.006919	0.091924	1.00	0.015449	0.086096	1.00
		36	0.008185	0.092189	1.00	0.000489	0.086293	1.00
		38	–0.071177	0.089070	1.00	–0.075254	0.083423	0.993
		39	–0.067474	0.102954	1.00	–0.112873	0.096428	0.981
	38	31	0.013184	0.026916	1.00	0.045831	0.025209	0.960
		32	0.013559	0.020861	1.00	0.018700	0.019539	1.00
		33	–0.022320	0.024656	1.00	–0.018623	0.023093	1.00
		34	0.037939	0.029275	1.00	0.007434	0.027552	1.00
		35	0.078097	0.029863	0.245	**0.09070***	0.027969	0.036
		36	0.079363	0.030670	0.090	0.075743	0.028568	0.171
		37	0.071177	0.089701	1.00	0.075254	0.083424	0.993
		39	0.003704	0.055148	1.00	–0.037619	0.051652	1.00
	39	31	0.009480	0.058228	1.00	0.083449	0.054537	0.997
		32	0.009854	0.055689	1.00	0.056316	0.052159	1.00
		33	–0.026024	0.057219	1.00	0.018996	0.053592	1.00
		34	0.003423	0.059356	1.00	0.045054	0.055659	1.00
		35	0.074393	0.059648	1.00	0.128322	0.055866	0.697
		36	0.075659	0.060056	1.00	0.113362	0.056169	0.876
		37	0.067474	0.102954	1.00	0.112873	0.096428	0.981
		38	–0.003704	0.055148	1.00	0.037619	0.051652	1.00

Table VIII Bonferroni test for short-term debt model

			1994			1996		
Test	(I) SIC	(J) SIC	Mean diff. (I-J)	Std. error	Sig.	Mean diff. (I-J)	Std. error	Sig.
Bonferroni	31	32	–0.001251	0.027122	1.00	–0.027962	0.028314	1.00
		33	–0.034191	0.029904	1.00	–0.071192	0.031244	0.825
		34	–0.008881	0.033750	1.00	–0.025551	0.035238	1.00
		35	0.057615	0.033991	1.00	0.047563	0.035622	1.00
		36	0.077511	0.034781	0.938	0.040956	0.036473	1.00
		37	0.072149	0.088133	1.00	0.034578	0.086784	1.00
		38	–0.026256	0.026065	1.00	–0.046280	0.027122	1.00
		39	–0.027772	0.056388	1.00	–0.119887	0.059037	1.00
	32	31	0.001251	0.027122	1.00	0.027962	0.028313	1.00
		33	–0.032941	0.025027	1.00	–0.043229	0.026310	1.00
		34	–0.007630	0.029458	1.00	0.002412	0.030946	1.00
		35	0.058866	0.029734	1.00	0.075525	0.031383	0.586
		36	0.078761	0.030633	0.370	0.068919	0.032347	1.00
		37	0.073399	0.086581	1.00	0.062541	0.085132	1.00
		38	–0.025005	0.020232	1.00	–0.018318	0.021252	1.00
		39	–0.029652	0.053930	1.00	–0.091924	0.056581	1.00

(continued)

Table VIII

			1994			1996		
Test	(I) SIC	(J) SIC	Mean diff. (I-J)	Std. error	Sig.	Mean diff. (I-J)	Std. error	Sig.
	33	31	0.034191	0.029960	1.00	0.071192	0.031244	0.825
		32	0.032941	0.025027	1.00	0.043229	0.026310	1.00
		34	0.025311	0.032090	1.00	0.045641	0.033649	1.00
		35	0.091807	0.032343	0.167	**0.118755***	0.034051	0.018
		36	0.111702*	0.033172	0.028	**0.112148***	0.034941	0.049
		37	0.106340	0.087511	1.00	0.105770	0.086151	1.00
		38	0.007936	0.023877	1.00	0.024911	0.025023	1.00
		39	0.006412	0.055411	1.00	−0.048695	0.058103	1.00
	34	31	0.008805	0.033750	1.00	0.025551	0.035238	1.00
		32	0.007629	0.029458	1.00	−0.002411	0.030947	1.00
		33	−0.025311	0.032090	1.00	−0.045641	0.033649	1.00
		35	0.066496	0.035882	1.00	0.073113	0.037748	1.00
		36	0.086391	0.036631	0.668	0.066507	0.038553	1.00
		37	0.081029	0.088880	1.00	0.060129	0.087679	1.00
		38	−0.017375	0.028488	1.00	−0.020729	0.029861	1.00
		39	−0.018891	0.057549	1.00	−0.094336	0.060344	1.00
	35	31	−0.057616	0.039906	1.00	−0.047563	0.035622	1.00
		32	−0.058866	0.029733	1.00	−0.075525	0.031384	0.586
		33	−0.091807	0.032343	0.167	**−0.118755***	0.034051	0.018
		34	−0.066496	0.035882	1.00	−0.073113	0.377488	1.00
		36	0.019895	0.036853	1.00	−0.006607	0.038904	1.00
		37	0.014533	0.088972	1.00	−0.012985	0.088783	1.00
		38	−0.083871	0.028772	0.131	−0.093843	0.030313	0.073
		39	−0.085388	0.057690	1.00	−0.167450	0.060570	0.209
	36	31	−0.077511	0.034781	0.938	−0.040956	0.036473	1.00
		32	−0.078762	0.030634	0.370	−0.068918	0.032347	1.00
		33	**−0.111703***	0.033172	0.028	**−0.112148***	0.034941	0.049
		34	−0.086391	0.036631	0.668	−0.066507	0.038553	1.00
		35	−0.019895	0.036852	1.00	0.006607	0.038904	1.00
		37	−0.005362	0.089277	1.00	−0.006378	0.088183	1.00
		38	**−0.103767***	0.029701	0.018	−0.087236	0.031309	0.196
		39	−0.105282	0.058159	1.00	−0.160843	0.061743	0.309
	37	31	−0.072149	0.088133	1.00	−0.034578	0.086743	1.00
		32	−0.073399	0.086581	1.00	−0.062541	0.085132	1.00
		33	−0.106340	0.087511	1.00	−0.105770	0.086152	1.00
		34	−0.081029	0.088880	1.00	−0.060129	0.087679	1.00
		35	−0.014533	0.088972	1.00	0.012985	0.087833	1.00
		36	0.005362	0.089276	1.00	0.006378	0.088183	1.00
		38	−0.098404	0.086255	1.00	−0.080858	0.084744	1.00
		39	−0.099921	0.099701	1.00	−0.154465	0.099656	1.00
	38	31	0.026256	0.026065	1.00	0.046280	0.027122	1.00
		32	0.025005	0.020202	1.00	0.018217	0.021252	1.00
		33	−0.007936	0.023877	1.00	−0.024912	0.025024	1.00
		34	0.017375	0.028488	1.00	0.020793	0.029807	1.00
		35	0.083871	0.028772	0.131	0.093843	0.030113	0.073
		36	**0.103767***	0.029701	0.18	0.087236	0.031309	0.196
		37	0.098404	0.086255	1.00	0.080858	0.084743	1.00
		39	−0.001516	0.053406	1.00	−0.076306	0.055995	1.00

(continued)

Table VIII

			1994			1996		
Test	(I) SIC	(J) SIC	Mean diff. (I-J)	Std. error	Sig.	Mean diff. (I-J)	Std. error	Sig.
	39	31	0.027772	0.056389	1.00	0.119887	0.059037	1.00
		32	0.026521	0.053930	1.00	0.091924	0.056581	1.00
		33	–0.006420	0.055411	1.00	0.048695	0.058104	1.00
		34	0.018891	0.057549	1.00	0.094336	0.060344	1.00
		35	0.085388	0.057690	1.00	0.167499	0.060570	0.209
		36	0.105283	0.058159	1.00	0.160843	0.061074	0.309
		37	0.099921	0.099701	1.00	0.154465	0.099656	1.00
		38	0.001516	0.053406	1.00	0.073606	0.055995	1.00

Table IX Tamhane test for short-term debt model

			1993			1995		
Test	(I) SIC	(J) SIC	Mean diff. (I-J)	Std. error	Sig.	Mean diff. (I-J)	Std. error	Sig.
Tamhane	31	32	–0.010612	0.029084	1.00	–0.010731	0.027717	1.00
		33	–0.044906	0.032127	0.999	–0.052505	0.030616	0.983
		34	0.010455	0.036066	1.00	–0.030661	0.034489	1.00
		35	0.046089	0.036582	1.00	0.044980	0.034862	0.999
		36	0.080161	0.037296	0.574	0.051704	0.035400	0.991
		37	0.098315	0.094508	0.998	0.021154	0.090063	1.00
		38	–0.029776	0.027950	1.00	–0.047391	0.026636	0.948
		39	–0.029278	0.060467	1.00	–0.086733	0.057624	1.00
	32	31	0.010612	0.029084	1.00	0.010731	0.027717	1.00
		33	–0.034294	0.026837	1.00	–0.041774	0.025575	0.992
		34	0.021067	0.031446	1.00	–0.019930	0.030103	1.00
		35	0.056701	0.032036	0.924	0.055711	0.030530	0.836
		36	0.090772	0.032849	0.053	0.062435	0.031143	0.639
		37	0.108927	0.092843	0.985	0.031885	0.088477	1.00
		38	–0.019164	0.021663	1.00	–0.036660	0.020645	0.918
		39	–0.018666	0.057830	1.00	–0.076002	0.055111	1.00
	33	31	0.044906	0.032127	0.999	0.052505	0.030616	0.983
		32	0.034294	0.026837	1.00	0.041774	0.025575	0.992
		34	0.055361	0.034280	0.996	0.021844	0.032793	1.00
		35	0.090995	0.034822	0.252	0.087485	0.033185	0.114
		36	**0.125066***	0.035571	0.003	0.104297	0.033749	0.062
		37	0.143221	0.093841	0.831	0.073660	0.089428	1.00
		38	0.015130	0.025604	1.00	0.005114	0.024400	1.00
		39	0.015327	0.059419	1.00	–0.034228	0.056625	1.00
	34	31	–0.010455	0.036066	1.00	0.030661	0.034489	1.00
		32	–0.021067	0.034146	1.00	0.019930	0.030103	1.00
		33	–0.055361	0.034280	0.996	–0.021844	0.032793	1.00
		35	0.035634	0.038486	1.00	0.075641	0.036788	0.822
		36	0.069705	0.039165	0.934	0.082365	0.037298	0.676
		37	0.087860	0.095261	1.00	0.051815	0.090827	1.00
		38	–0.40231	0.030400	1.00	–0.016730	0.029111	1.00
		39	–0.039734	0.061638	1.00	–0.056724	0.058809	1.00

(continued)

Table IX

Test	(I) SIC	(J) SIC	1993 Mean diff. (I-J)	1993 Std. error	1993 Sig.	1995 Mean diff. (I-J)	1995 Std. error	1995 Sig.
	35	31	–0.046089	0.036582	1.00	–0.044980	0.034862	0.999
		32	–0.056701	0.032036	0.924	–0.055711	0.030530	0.836
		33	–0.090995	0.034822	0.252	–0.097485	0.033185	0.114
		34	–0.035634	0.038486	1.00	–0.075641	0.036788	0.822
		36	0.034071	0.039641	1.00	0.006724	0.037643	1.00
		37	0.052226	0.095457	1.00	–0.023826	0.090969	1.00
		38	–0.075865	0.031010	0.381	**–0.092371***	0.029552	0.032
		39	–0.075368	0.061941	1.00	–0.431713	0.059028	0.870
	36	31	–0.080161	0.037296	0.574	–0.051704	0.035399	0.991
		32	–0.090773	0.032849	0.053	–0.062435	0.031143	0.639
		33	**–0.125067***	0.035571	0.003	–0.104210	0.033749	0.062
		34	–0.069705	0.039165	0.934	–0.082365	0.037298	0.676
		35	–0.034071	0.039641	1.00	–0.006724	0.037643	1.00
		37	0.018154	0.095733	1.00	–0.030555	0.091176	1.00
		38	**–0.109937***	0.031850	0.003	**–0.099095***	0.03018	0.014
		39	–0.109439	0.062365	0.965	–0.138438	0.059347	0.806
	37	31	–0.098315	0.094508	0.998	–0.021154	0.090063	1.00
		32	–0.108927	0.092843	0.985	–0.031885	0.088477	1.00
		33	–0.143220	0.093840	0.831	–0.073660	0.089428	1.00
		34	–0.087860	0.095261	1.00	–0.051815	0.090827	1.00
		35	–0.052225	0.095458	1.00	0.023826	0.090969	1.00
		36	–0.018154	0.095733	1.00	0.030550	0.091176	1.00
		38	–0.128091	0.092494	0.921	–0.068545	0.088144	1.00
		39	–0.127593	0.106912	0.994	–0.107888	0.101884	0.999
	38	31	0.029776	0.027950	1.00	0.047391	0.026636	0.948
		32	0.019163	0.021663	1.00	0.036660	0.020645	0.918
		33	–0.015130	0.025604	1.00	–0.005114	0.024400	1.00
		34	0.040231	0.030400	1.00	0.016730	0.029111	1.00
		35	0.075865	0.031011	0.381	**0.092371***	0.029552	0.032
		36	**0.109937***	0.031850	0.003	**0.099095***	0.030185	0.014
		37	0.128091	0.092493	0.921	0.068545	0.088144	1.00
		39	0.000497	0.057268	1.00	–0.039342	0.054575	1.00
	39	31	0.029278	0.060467	1.00	0.086733	0.057623	1.00
		32	0.018666	0.057830	1.00	0.076002	0.055111	1.00
		33	–0.015628	0.059419	1.00	0.034228	0.056625	1.00
		34	0.039734	0.061338	1.00	0.056072	0.058889	1.00
		35	0.075368	0.061941	1.00	0.131713	0.059028	0.870
		36	0.109439	0.062365	0.965	0.138438	0.059348	0.806
		37	0.127593	0.106912	0.994	0.107888	0.101884	0.999
		38	–0.000497	0.057268	1.00	0.039343	0.054575	1.00

The regression coefficients obtained for the three groups, concerning the total debt, are displayed in Table X. The results show higher explanatory power for groups belonging to SIC 33 and 38 as well as those belonging to SIC 35 and 36. For the remaining firms there is a loss (R^2 falls 3.6 per cent). For SIC 33 and 38, the model shows results in which all variables are statistically significant. These results are also confirmed by the analysis of the regression coefficients of short-term debt (Table XI). For this group (for SIC 33 and SIC 38) the short-term debt model shows results with all variables statistically significant (except profitability and growth options).

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Table X Regression coefficients for total debt subgroups

Independent variables	Dependent variable γ_1 total debt SIC codes 33 and 38	SIC codes 35 and 36	Other firms
Other fiscal benefits	−0.522999	−0.473628	−0.0553180
σ	0.112999	0.154023	0.100707
t-statistic	−4.628373**	−3.075056**	−0.528065
Economic risk	0.290934	+0.173810	0.238899
σ	0.039841	0.066259	0.053538
t-statistic	7.302349**	2.623197**	4.462266**
Size	−0.73133	−0.094269	−0.067322
σ	0.008015	0.013414	0.008424
t-statistic	−9.124107**	−7.027771**	−7.991962**
Age	−0.000175	−0.000512	0.000258
σ	0.000039	0.000383	0.000196
t-statistic	−4.473016**	−1.335412	1.316115
Asset composition	−0.162569	−0.025163	−0.099304
σ	0.031663	0.045350	0.032111
t-statistic	−5.134289**	−0.554869	−3.092524**
Profitability	−0.081472	−0.511928	−0.224923
σ	0.049981	0.097269	0.038140
t-statistic	−1.630068	−5.262987**	−5.897211**
Growth	0.135991	+0.193534	0.076257
σ	0.021191	0.033755	0.030037
t-statistic	6.417424**	5.733495**	2.538774*
Growth options	0.166709	0.964345	−0.2211305
σ	0.159529	0.314269	0.157253
t-statistic	1.045008	3.068538**	−1.407321
Constant	0.999922	1.066936	0.935669
σ	0.039990	0.072635	0.048217
t-statistic	25.00442	14.68896	19.40523
Adj. coeff. ($\bar{R}^2$)	19.5	24.1	12.9
F statistic	51.61222	24.48503**	32.50733

Notes: * Statistically at a 5% level of significance; ** Statistically at a 1% level of significance

Table XI Regression coefficients for short-term debt subgroups

Independent variables	Dependent variable γ_1 total debt SIC codes 33 and 38	SIC codes 35 and 36	Other firms
Other fiscal benefits	−0.416144	−0.213549	0.115047
σ	0.117144	0.154332	0.106105
t-statistic	−3.552409**	−1.383699	1.084276
Economic risk	0.311534	0.156403	0.181256
σ	0.044075	0.066234	0.052939
t-statistic	7.068269**	2.361356*	3.423844**
Size	−0.092182	−0.093682	−0.084171
σ	0.008154	0.013636	0.008519
t-statistic	−11.30575**	−6.870399**	−9.880774**
Age	−0.000156	−0.000358	0.000342
σ	0.0000346	0.000470	0.000159
t-statistic	−4.505158**	−0.762307	2.150064*
Asset composition	−0.339894	−0.209691	−0.240601
σ	0.032296	0.046459	0.031517
t-statistic	−10.52417**	−4.513476**	−7.633943**
Profitability	−0.031604	−0.372419	−0.171422
σ	0.041108	0.099389	0.035142
t-statistic	−0.768800	−3.747093	−4.877941**
Growth	0.138185	0.170812	0.070759
σ	0.020909	0.034098	0.026842
t-statistic	6.608977**	5.009511**	2.636110**
Growth options	0.200931	0.336201	−0.232904
σ	0.161903	0.368826	0.157348
t-statistic	1.241059	0.911544	−1.480184
Constant	−1.064697	1.029218	0.984775
σ	0.041221	0.073108	0.049375
t-statistic	25.82869	14.077806	19.94471
Adj. coeff. ($\bar{R}^2$)	28.6	23.6	17.2
F statistic	84.34884	23.87544**	45.10588

Notes: * Statistically at a 5% level of significance; ** Statistically at a 1% level of significance

Summary and conclusions

What determines the optimal capital structure is still an ongoing and complex matter. The complexity is greater for firms that tend to preserve a culture averse to the sharing of capital and management responsibilities.

The lack of reliable data sets has led to an incomplete understanding on the determinants of corporate debt policy in less developed economies. Indeed, results obtained in previous studies have been controversial. Yet, the topic is crucial at both corporate and social levels, given the contribution of small firms to employment and economic growth in both developed and less developed countries.

The results obtained from this study can be summarised as follows:

- The financial management of small firms is strongly oriented by criteria of a fiscal nature.
- Bankruptcy costs are specially significant, making small firms very sensitive to financial leverage.
- Size seems to be a major discriminatory factor for access to financing, particularly long-term credit.
- Ability to provide collateral is a determinant factor for undertaking credit operations. By demanding collateral, creditors transfer the monitoring costs inherent to debt to the entrepreneurs.
- During credit negotiations, creditors weigh the collateral value much more than

the earnings registered in firm accounts, probably due to the shortage or lack of credible information about small firms.

- The younger firms are the most dependent on debt, because they cannot count on a cushion of accumulated revenues generated by past investments.
- The existence of a positive relationship between debt and growth suggests that the capital structure is passively determined by the need for resources to invest, in consistence with Pinegar and Wilbricht (1989) and Baskin (1989).
- The industry effect is important, as it was found that risk levels and capital structure are significantly different among industries.
- The industry effect led to the identification of three main groups. Firms belonging to the "wood and cork industry" and "metal products, machinery and transport equipment" (SIC 33 and 38), have debt ratios higher than the mean. By contrast, firms belonging to SIC 35 (chemical, oil products, coal, rubber and plastics) and 36 (non-metal minerals, excluding oil and coal) showed debt ratios significantly lower than the mean.

There is no simple answer for corporate debt policy, whether relating to large firms or small firms. The results of this study have shed some further light by empirically testing the factors affecting debt to equity ratios for a less developed country. The results and practice have shown that capital structure is a relevant corporate financial decision that entrepreneurs have to make, as investment and financing decisions are interconnected. This relationship is well evident in small firms, where there is a large dependence on the capacity to prefer collateral to obtaining long-term credit. It is thus essential for governments, Regional Development Agencies and particularly the European Union (at the time of discussing and implementing the "Fourth Multinational Programme for Small and Medium Enterprises in the European Union" for the period 2000 to 2004), to develop an innovative financial package for small firms. This appears to be paramount given the inadequacy of banking credit to finance risky new ventures and small firms' expansion and the relative under development of most European capital markets.

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