Accounting and Finance 43 (2003) 123–147

Capital structure and financing of SMEs: Australian evidence

Gavin Cassar[a], Scott Holmes[b]

[a]Haas School of Business, University of California at Berkley, Berkley, CA, 94720-1900
[b]Graduate School, The University of Newcastle, Callaghan, NSW, Australia 2308

Abstract

This paper investigates the determinants of capital structure and use of financing for small and medium sized enterprises. Hypotheses utilising static trade-off and pecking order arguments are empirically examined using a series of firm characteristics including: size, asset structure, profitability, growth and risk. The hypotheses developed are tested using a large Australian nationwide panel survey. The results suggest that asset structure, profitability and growth are important determinants of capital structure and financing. For asset structure the direction of the influence is reliant upon the capital structure or financing measure employed. The results generally support static trade-off and pecking order arguments proposed by theoretical models.

Key words: Capital structure; Financing; Small and medium sized enterprises

JEL classification: G30, G35.

1. Introduction

This paper investigates the determinants of capital structure and the use of financing by Small and Medium sized Enterprises (SMEs). Financial theories have been developed to explain capital structure, with empirical evidence based upon large listed firms tending to support these theories. However, the question as to the whether these arguments are valid for other firms, particularly smaller firms, has received limited attention. The applicability of these financial theories, or their relative effects can be questioned when considering the influence of various institutional settings and scale effects upon the cost or even availability of financing alternatives.

Institutional differences in the types of financial organisations, their predominance and the traditional markets they serve, vary the way investment and capital are allocated. For example, different investor groups may use different criteria for evaluating financing decisions. Even across settings where similar investor groups exist, the allocation decisions may differ due to regulatory

requirements on lending or equity funding, and the institutional flexibility of capital providers to finance certain firm types. Thus the cost of particular financing or even its availability may vary across settings.

Scale effects may also influence the presence or degree of influence of particular financial theories upon capital structure. For example, scale effects relating to size may only be applicable (or linear) across particular sized firms. Does the role of asset structure increase in influence for smaller firms due to the perceived increased risk, or variations in agency costs such as monitoring? Additionally, the influence of growth opportunities for smaller scale firms could be questioned, as many of these firms may have strong growth opportunities.

Differences between small and large firms, with respect to financial decision-making and structures, may also be a direct function of the constrained management skills and knowledge of small firm owners, who normally operate without day-to-day access to appropriate professional advise. This issue has been a repeated theme within the SME literature and is a direct function of size, but also the limited separation of business decisions, from the personal objectives and assets of the owners (for a summary of this literature see Holmes *et al.*, (2002)). Basically, SME owner/managers may have constrained knowledge of funding options, while some options may not be acceptable for personal reasons (for example, a possible loss of control of all business decisions), and therefore are not options at all. These knowledge, preference and possible supply constraints may well confound the application of existing finance theories to the SME sector.

The existing Australian evidence pertaining to the capital structure of unlisted firms tends to be more descriptive in focus, or generally ignores firm specific characteristics in explaining financing choice (Bird and Juttner, 1975; Holmes and Kent, 1991; Haron, 1996; Kotey, 1999). For example, Holmes and Kent (1991) surveyed 391 Australian metal and engineering firms and examined sources of start-up and additional debt and equity funding and the reasons for their use. More recently, Kotey (1999) examined the role of demand side factors such as personal values and financial planning on forms of debt utilised by 224 furniture manufacturers in New South Wales, with no consideration of the financial characteristics of respondents.

This study employs a firm characteristic static framework to empirically test finance theories, thereby building on previous research which has provided a more descriptive understanding (or investigated issues outside the firm characteristic approach). By using a nationwide survey across several industry sectors, this study overcomes existing generalisability problems associated with samples of limited geographic or industry scope. In addition, this study utilises data from a setting which has received relatively limited empirical investigation, complementing extant evidence which has been dominated by studies reflecting both US and UK settings.

The sample examined consists of 1,555 firms with under 200 employees. The empirical testing utilises five different but related financing and capital

structure measures. The use of these measures overcomes problems associated with classifying quasi-equity and provides insight into the financing behaviours of different capital providers. The results suggest that asset structure, profitability and growth are important influences upon SME financing and capital structure. There was also weaker evidence for size and relative risk influencing financing and capital structure choice. These results reconcile with the theories developed in finance to explain capital structure choice within the firm, including static trade-off arguments utilising bankruptcy, agency and tax costs and pecking order arguments which rely on information asymmetries. Thereby this study demonstrates the applicability of financial theories both in reference to SMEs and Australian firms.

2. Literature – theories of capital structure

Generally the theoretical principles underlying the capital structure and financing choices of large firms also apply to SMEs.[1] These principles can be described either in terms of a static trade-off choice or pecking order framework. Static trade-off choice encompasses several aspects, including the exposure of the firm to bankruptcy and agency costs against the tax benefits associated with debt use.

Bankruptcy costs are the costs directly incurred when the perceived probability that the firm will default on financing is greater than zero. One subset of bankruptcy costs are liquidation costs, which represents the loss of value as a result of liquidating the net assets of the firm. These liquidation costs reduce the proceeds to the lender, should the firm default on finance payments and become insolvent. Given the reduced proceeds, financiers will *ex-ante* adjust their cost of finance to the firm to incorporate this potential cost of value. Consequentially, firms will incur higher finance costs due to the potential liquidation costs. These costs should vary cross-sectionally between firms based on the size, tangibility and generalisability of the assets portrayed in the firms' balance sheet.

Firms can incur such costs even if only non-lending stakeholders believe that the firm has a non-zero probability of being discontinued, these costs are referred to as distress costs. For example, if a business is perceived to be close to bankruptcy customers may be less willing to buy goods and services due to the risk of the firm not being able to meet its warranty obligations. Also, employees might be less inclined to work for the business, or suppliers less likely to extend trade credit. All these behaviours by the stakeholders effectively reduce the value of the firm. Therefore, firms which have high distress costs would have incentives to decrease outside financing so as to lower these

[1] The major exception to this being the theories which involve conflicts between owners and management. Basically, SMEs tend to have a less pronounced separation of ownership and management than larger firms.

costs. Given these bankruptcy costs, the operating risk of the firm would also influence the capital structure choice of the firm, in that firms which have higher operating risk would be exposed to higher bankruptcy costs, making the explicit and implicit costs of outside financing greater for these higher risk firms. A compounding factor is that research has found that high growth firms often display similar financial and operating profiles of bankrupt firms (Hutchinson and Ray, 1986; Hutchinson and Mengersen, 1989). This may act to affect the financing options of high growth firms.

The use of debt in the capital structure of the firm also leads to agency costs. Agency costs are the costs that arise as a result of a principle-stakeholder relationship, such as between the equity-holders or managers of the firm and debt-holders. In particular, given the incentive for the firm to benefit equity-holders at the expense of debt-holders, debt-holders need to restrict and monitor the firms' behaviour. Consequently, costly monitoring devices (or contractual covenants) are incorporated into debt agreements, designed to protect the debt-holders from this potential behaviour. All these contracting behaviours should increase the cost of capital offered to the firm. Therefore firms with relatively higher agency costs due to the inherent conflict between the firm and the debt-holders should have lower levels of outside debt financing and leverage.

Another issue for the firm to consider within the static trade-off framework is the tax benefits associated with debt use. This benefit is created, as the interest payments associated with debt are tax deductible, while payments associated with equity, such as dividends are not tax deductible. Therefore, this tax effect encourages debt use by the firm, as more debt increases the after tax proceeds to the owners. However, consideration of the investors' or entrepreneurs' potential tax exposures due to possible imputation of firm returns and the entrepreneurs' effective marginal tax rate should also be incorporated in such trade-off considerations.

The pecking order hypothesis suggests that firms have a particular preference order for financing choices used to finance the firm (Myers, 1984). In particular, due to the presence of information asymmetries between the firm and the potential financiers, the relative costs of finance will vary between the financing choices. For example, inside finance, where the funds provider is the firm (retained profits or contributions of existing owners), will have more information about the firm than new equity holders, therefore these new equity holders will expect a higher rate of return on capital invested, resulting in new equity finance being more costly to the firm than using existing internal funds. A similar argument can be provided between inside finance and new debt-holders. Additionally, the greater the exposure to the risk associated with the information asymmetries for the various outside financing alternatives available, the higher the return of capital demanded by each source. Consequently, the firm will prefer inside finance to debt, short-term debt over long-term debt, and any debt over outside equity. Clearly if the information asymmetries are larger for certain firms, the difference in the cost of capital for various financing choices should widen and the pecking order preference for the firm become more pronounced.

In addition to these issues, the majority of financing alternatives incur transaction costs. For example, when firms are applying for loans they incur application and start-up fees (Dunstan *et al.*, 1994). Consequently, it is generally not costless to adopt or alter financing for the firm. This may lead to 'sticky' financing choices, where firms have a disincentive to move between financing options. Also due to the operation and scale of the firm SMEs can be affected by market access, in that their returns and scale make some financing options either unavailable or transaction costs far too costly to adopt.

3. Firm characteristics and financing

As in much empirical research, theoretical constructs must be proxied indirectly through the use of firm characteristics. Therefore the hypotheses and results must be interpreted in light of the fact that several theoretical effects are represented by each firm variable. The firm variables discussed are size, asset structure, profitability, risk and growth.

3.1. Size

There are several theoretical reasons why firm size would be related to the capital structure of the firm. Firstly, smaller firms may find it relatively more costly to resolve informational asymmetries with lenders and financiers. Consequently, smaller firms are offered less capital, or are offered capital at significantly higher costs to larger firms, which discourages the use of outside financing.

The transaction costs associated with financing may also affect financing choices as transaction costs are most likely a function of scale, with smaller scale financing resulting in relatively higher transaction costs (Titman and Wessels, 1988; Wald, 1999). A related issue is the marginal effects of market access for different sized firms (Scherr *et al.*, 1993). This could be a function of high transaction costs effectively making some financing options outside the available set of financing choices of the firm. However, market access can also be constrained directly in that some financing options are not in the scale range that financiers would consider issuing finance. A simple example is the scale required to obtain equity funds publicly, thereby excluding smaller firms from this type of finance. Another explanation for smaller firms having less outside financing or lower debt is if the relative costs of bankruptcy are an inverse function of firm size. These bankruptcy costs can be both direct, affecting liquidation returns, or indirect in the form of stakeholders losing confidence in the businesses survival or through less discretion on operating decisions (Titman and Wessels, 1988). Finally, if operating risk is inversely related to firm size, this should predispose smaller firms to use relatively less debt and outside financing (Cosh and Hughes, 1994).

The empirical evidence investigating the relationship between size and financing for firms of similar scale to those examined in this study generally

supports a positive relationship between firm size and leverage, long-term leverage, outside financing and bank financing. One caveat to this is a negative relationship between short-term liabilities and firm size (Osteryoung *et al.*, 1992; Chittenden *et al.*, 1996; Michaelas *et al.*, 1999; Fluck *et al.*, 2000).

3.2. Asset structure

Asset structure should be an important determinant of the capital structure of a new firm. The degree to which the firms' assets are tangible and generic should result in the firm having a greater liquidation value (Harris and Raviv, 1991; Titman and Wessels, 1988). This will reduce the magnitude of financial loss incurred by financiers should the company default. By pledging the firms' assets as collateral or arranging so that a fixed charge is directly placed to particular tangible assets of the firm, also reduces adverse selection and moral hazard costs. This will result in firms with assets that have greater liquidation value having relatively easier excess to finance, and lower costs of financing, leading to these firms having a higher level of debt or outside financing in their capital structure. Several authors suggest that bank financing will depend upon whether the lending can be secured by tangible assets (Storey, 1994; Berger and Udell, 1998).

The empirical evidence suggests a positive relationship consistent with theoretical arguments between asset structure and leverage for large firms. The limited smaller firm research, while not conclusive, shows signs of a positive relationship between asset structure and leverage, long-term debt, and possibly a negative relationship with short-term debt (Van der Wijst and Thurik, 1993; Chittenden *et al.*, 1996; Jordan *et al.*, 1998; Michaelas *et al.*, 1999).

3.3. Profitability

The hypothesised relationship between firm profitability and capital structure is founded on Myers (1984) pecking order hypothesis. Given the information asymmetries between the firm and outsiders, firms have a preference for inside financing over outside financing, as the cost for outside capital should be greater for the firm. Therefore, profitable firms, which have access to retained profits can use these for firm financing rather than accessing outside sources. Even though more profitable firms would be more likely to get access to such capital, these firms will prefer inside funds to finance their operations and investments. Empirical evidence from previous studies examining SMEs is consistent with pecking order arguments with leverage being found to be negatively related to profitability (Wijst and Thurik, 1993; Chittenden *et al.*, 1996; Jordan *et al.*, 1998; Coleman and Cohn, 1999; Mishra and McConaughy, 1999; Michaelas *et al.*, 1999).

3.4. Risk

Given agency and bankruptcy costs, there are incentives for the firm not to fully utilise the tax benefits of 100 per cent debt within the static framework model. The more likely a firm will be exposed to such costs, the greater their incentive to reduce their level of debt within the capital structure of the firm. One firm variable which impacts upon this exposure is firm operating risk, in that the more volatile firm earnings streams, the greater the chance of the firm defaulting and being exposed to such costs. Consequently, these firms with relatively higher operating risk will have incentives to have lower leverage than other more stable earnings firms. Unusually, the limited empirical evidence between risk and leverage for SMEs suggests a positive rather than negative relationship (Jordan *et al.*, 1998; Michaelas *et al.*, 1999).

3.5. Growth

Applying pecking order arguments, growing firms place a greater demand on the internally generated funds of the firm. Consequentially, firms with relatively high growth will tend to look outside the firm to finance the growth. Therefore, these firms should look to short-term less secured debt then to longer-term more secured debt for their financing needs. This should lead to firms with relatively higher growth having more leverage.

In addition, there is a relationship between the degree of previous growth and future growth. Michaelas *et al.* (1999) argue that future growth opportunities will be positively related to leverage, in particular short-term leverage. They argue that the agency problem and consequentially the costs of financing are reduced if the firm issues short-term rather than long-term debt. This is in direct contrast to Myers (1977), who argues that conflicts between debt and equity holders are especially serious for assets that give the firm the option to undertake growth opportunities in the future, resulting in firms with such growth opportunities having less debt. Michaelas *et al.* (1999) found future growth positively related to leverage and long-term debt, while Chittenden *et al.* (1996) and Jordan *et al.* (1998) found mixed evidence.

4. Method

4.1. Sample

This study utilises data obtained from the Business Longitudinal Survey (BLS) developed by the Australian Bureau of Statistics (ABS). The surveys were designed to provide information on the growth and performance of Australian businesses and to identify selected economic and structural characteristics of these businesses. The ABS business register was used as the population frame

for the survey with approximately 13,000 business units being selected for inclusion in the first (1994–95) survey. For future surveys a sub-sample of the original selections for the 1994–95 survey were selected. All business units in the Australian economy were included in the scope of the survey, except for non-employing businesses, government enterprises and selected Australian New Zealand Standard Industrial Classification (ANZSIC) industry codes.[2] The BLS required each firm to provide information about the composition of the debt and equity in the balance sheet each year it was administered (1995–1998). In order to ensure that financial information of the firms was not perturbed in any way, we used the BLS data-set available only on site at the ABS in Canberra.

The selection criteria required all firms to make responses to all of the variables required for analysis for each of the four years of the survey. Additionally, all firms were required to have positive sales over the four year period to eliminate firms which were temporarily unoperational, or in the very early or very late stages of business operations. Firms without all data available for the multivariate analyses were excluded. To ensure that this study investigates firms which have material capital structures, yet are consistent with the examination of SMEs, all firms with less than $500 assets or greater than $25,000,000 assets were eliminated. Also, all mining firms (ANZSIC code 1) were deleted due to their unusual operating nature. As the focus of this study is SMEs financed independently, (not through public equity raising), all firms which had any financing from 'parent companies' or 'stakeholders' were excluded.[3] Clearly the inclusion of firms with parent company finances creates noise and potentially errors in the estimation of our coefficients of interest. As no information is available about the parent, in particular its capital structure, those firms were excluded. Finally, to avoid problems with negative values and negative-equity firms, which can appear as a consequence of using book values rather than market values, all firms with over 100 per cent leverage were eliminated. After the selection criteria were employed a final sample of 1,555 firms was available for analysis.

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[2] Excluded industries included ANZSIC divisions: A – Agriculture, forestry and fishing; D – Electricity, gas and water supply; J – Communication services; M – Government administration and defence; N – Education; O – Health and community services; subdivisions: 96 – Other services; 97 – Private households employing staff; and groups: 921 – Libraries; 922 – Museums; 923 – Parks and gardens.

[3] The 'shareholders' classification in the BLS does not necessarily mean that these firms obtained outside equity publicly, and potentially can represent several types of capital. The ambiguous nature of the shareholders classification creates the potential for noise if these firms are included in the final analyses. The exclusion of these firms also avoids problems associated with the classification of inside and outside financing. All tests were re-run separately without the exclusion of these firms with shareholders and firms with parent financing, none of the findings were significantly affected.

4.2. Variables

Five capital structure and financing measures were used for the study's dependent variables: leverage, long-term leverage, short-term leverage, outside financing and bank financing. These variables were either taken directly from the survey or created using the sum of different financing options listed in the study. A summary of the different financing choices available on the survey and the variables developed from them is contained in Appendix A.

Leverage (*LEV*) is the total debt of the firm divided by the total assets. Given the scale of the firms in the sample and the financial information available, market values of debt or equity could not be considered, as they generally are in studies examining larger listed firms. Long-term leverage (*LONG*) is included, as not all components of leverage are homogenous. Apart from the obvious maturity and duration differences, long-term leverage is more fixed and arguably more deliberate, with greater contractual obligations and screening processes required. The proportion of non-current debt was explicitly requested by the survey. Therefore short-term leverage (*SHOR*) is the difference between leverage and long-term leverage.

The creation of an outside financing (*OUT*) measure provided an alternative (but intuitive) means of examining the influence of agency cost arguments upon financing choice. For example, leverage holders of a firm may be insiders, who have substantial knowledge of the firm, or they may have strong ties to the entrepreneur, which may make them less likely to be subject to the entrepreneurs' opportunistic behaviour. Consequently, issues relating to moral hazard and information asymmetry may be better examined through the use of outside finance. The use of an outside financing variable is consistent with recent research examining smaller firm financing (Fluck *et al.*, 2000; Ayers *et al.*, 2000). In addition, although not used for the testing of hypotheses, inside financing was also created for descriptive purposes.

In addition to outside financing, a bank financing (*BANK*) measure was also incorporated into the empirical testing. Several studies have looked specifically at the use and level of bank financing by firms, although bank financing has received more attention when the focus of the research is on SMEs, rather than larger firms, due to the accessibility of this type of financing to SMEs (Freedman and Godwin, 1994; Storey, 1994; Cressy, 1996). Using the bank financing definition is also advantageous in that we can observe the behaviour of a particular group of outside financiers, to investigate if they behave differently to 'other' outside financiers. Potential differences that might be found include the issuance of more financing for firms with particular characteristics, such as a potentially greater reliance of assets in place for securing debt. Under the financing categories of outside financing and bank financing adopted by this study, whether the capital is provided as a loan or as equity is not considered relevant. Hence these variables overcome potential problems associated with the identification of debt and equity or the use of quasi-equity by SMEs (Ang, 1992).

While this study uses book values for the dependent financing variables, generally market values are utilised when undertaking an empirical investigation of firms' capital structure, particularly for larger listed firms. Information about market values of the firm's equity was unavailable from the survey, and such information could not be obtained from other sources. The main consequence of using book values as opposed to market values is a lower positive coefficient between firm profitability and the financing variables. The lower coefficient results from book values being unable to capture the positive correlation between market value of equity and the profitability of the firm.

However, the applicability of market values as applied to SMEs can be questioned. The use of market values, assumes that a market for firm equity exists. In many cases due to information asymmetries and agency considerations SMEs do not have such markets, or they are very illiquid. In addition, given the influence of the major decision maker, the ability to value such equity, given a potential sale of firm equity is problematic. For example, the firm value with or without the founder managing the firm can vary substantially. This suggests that the applicability of market values in regard to smaller firm capital structure is problematic.

Tests for the continuous variables, represented by the proportion of the dependent variable to total assets were undertaken using ordinary least squares (OLS) regression. Given the panel nature of the data there may be an argument to support the use of panel techniques for analysis, however, the lack of data points over time (four) suggested that employing a static framework was more appropriate. In particular, the limited data points over time would most likely lead to high standard errors on such a panel analysis, resulting in a relatively low powered test.

The independent variables (as discussed in section four) are summarised below:

SIZE = Log 10 of total assets
NONA = Non-current assets divided by total assets
ROA = Return on assets before interest
RISK = Absolute coefficient of variation in profitability
GROW = Growth in sales

Ideally *NONA* would be the fixed tangible assets of the firm divided by total assets, however, information about the tangibility of assets was not available for the year examined. In earlier years where such information was available, the correlation between tangible non-current assets divided by total assets and all non-current assets divided by total assets was between 0.763 and 0.771. This suggests that the use of *NONA* as an instrument for fixed tangible assets is appropriate provided this variable is uncorrelated with the disturbance in the estimation model.

To ensure that the analysis was not overly influenced by outliers, *ROA*, *RISK* and *GROW* were truncated. In particular, *ROA* was bounded between 0.5 and

–0.5, *RISK* was bounded between 0 and 2, and *GROW* was winsorised at 5 per cent on either tail.[4] The dependent financing measures are based on 1998 survey results, while the independent variables are based on a three-year average of each variable for the years from 1995 to 1997. All the independent variables employed by this study have been used by previous empirical studies examining SMEs financing choice.

5. Results

5.1. Descriptive statistics

Table 1 provides a summary of the descriptive statistics of the dependent and independent variables. The mean (median) leverage of the sample firms was 0.5704 (0.6084). However, it is important to recognise that this is after the exclusion of firms beyond the bounds of 'technical' solvency. Including such firms would increase the magnitude of leverage. The mean long-term leverage suggests that it represents around 17 per cent of the capital of SMEs. The mean (median) short-term leverage of the sample firms was 0.3960 (0.3529); this highlights the importance of short term debt over long-term debt in SME financing.

Outsider financing appears to constitute 38 per cent of the capital of SMEs. We estimate that insider sources constitute 52 per cent of the capital of the firms, with the remaining proportion represented through provisions for liabilities, deposits, outstanding claims, and investments by non-director employees which was classified as neither outside or inside financing.[5] The relatively low levels of bank financing are consistent with existing empirical evidence.

The correlations between the dependent variables and independent variables are provided in Table 2. As expected all the dependent variables are significantly related with each other ($p > .001$). Examining the univariate relationships between the dependent and independent variables, of particular note is the consistent positive (negative) correlation between *GROW* (*ROA*) and the dependent variables. Strong correlations between *NONA* and the financing variables are also observed, however, the direction varies with the dependent variable examined. In particular, there is a negative relationship between *NONA* and *LEV*, and *NONA* and *SHOR*, however, there is a significant positive correlation between

[4] Alternative methods for adjusting the independent variables to reduce the influence of outliers were also investigated, including log transformation, squared and root transformations, winsorisation and bounding values. These other methods generally did not reduce the distributional problems associated with the variables. Results of analysis performed with unadjusted dependent variables were generally similar, except for some loss of precision (increased standard errors). In addition, analyses were also undertaken varying the bounds or winsorisation with limited effect on results.

[5] The results are not affected by the inclusion of any of these categories into outside financing.

Table 1
Descriptive statistics of dependent and independent variables (n = 1,555)

	Mean	Standard Deviation	25%	Median	75%
Dependent Variables					
LEV	0.5704	0.3066	0.3308	0.6084	0.8308
LONG	0.1744	0.2248	0.0000	0.0690	0.3000
SHOR	0.3960	0.2875	0.1531	0.3529	0.6126
OUT	0.3791	0.2873	0.1273	0.3471	0.5926
BANK	0.1826	0.2293	0.0000	0.0813	0.3074
Independent Variables					
SIZE	5.6883	0.7375	5.2122	5.6917	6.2380
NONA	0.4630	0.2731	0.2259	0.4427	0.6833
ROA	0.1905	0.1696	0.0696	0.1519	0.2900
RISK	0.8330	0.6253	0.3251	0.6389	1.2190
GROW	0.0878	0.1503	0.0110	0.0621	0.1563

Dependent Variables
LEV = Liabilities divided by assets
LONG = Long-term liabilities divided by assets
SHOR = Short-term liabilities divided by assets
OUT = Outside financing divided by assets
BANK = Bank financing divided by assets

Independent Variables
SIZE = Log 10 of total assets
NONA = Non-current assets divided by total assets
ROA = Return on assets before interest
RISK = Coefficient of variation in profitability
GROW = Growth in sales

Dependent variables are based on 1998 values.
Independent variables are three year averages based on 1995 to 1997 values.

NONA and *BANK*. Finally, examining the correlations between size and the other independent variables it is found that larger firms have a lower proportion of non-current assets, lower profitability and less risk.

5.2. Multivariate analysis

The model empirically tested for each dependent variable Y is as follows:

$$Y = \beta_0 + \beta_1 SIZE + \beta_2 NONA + \beta_3 ROA + \beta_4 RISK + \beta_5 GROW \quad (1)$$

This model incorporates the main variables and constructs which have been empirically investigated in capital structure research. The predicted sign for the coefficients with respect to leverage is displayed under each independent variable. Based upon the discussion in section 3 it is expected that when examining

Table 2
Pearson and Spearman correlations between dependent and independent variables (n = 1,555)

	LEV	LONG	SHOR	OUT	BANK	SIZE	NONA	ROA	RISK	GROW
LEV	–	0.449	0.716	0.675	0.466	0.159	−0.153	−0.204	0.027	0.059
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.287)	(0.020)
LONG	0.422	–	−0.303	0.334	0.456	0.063	0.245	−0.093	−0.005	0.023
	(0.000)		(0.000)	(0.000)	(0.000)	(0.014)	(0.000)	(0.000)	(0.852)	(0.355)
SHOR	0.705	−0.191	–	0.459	0.140	0.121	−0.355	−0.145	0.032	0.045
	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.200)	(0.079)
OUT	0.653	0.361	0.491	–	0.684	0.081	−0.076	−0.129	0.020	0.068
	(0.000)	(0.000)	(0.000)		(0.000)	(0.001)	(0.003)	(0.000)	(0.424)	(0.007)
BANK	0.444	0.446	0.201	0.673	–	−0.009	0.191	−0.049	−0.014	0.026
	(0.000)	(0.000)	(0.000)	(0.000)		(0.719)	(0.000)	(0.053)	(0.586)	(0.304)
SIZE	0.112	0.194	0.154	0.098	0.093	–	−0.223	−0.271	−0.248	−0.040
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.116)
NONA	−0.143	0.203	−0.362	−0.083	0.173	−0.225	–	0.041	0.035	0.014
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)		(0.108)	(0.162)	(0.571)
ROA	−0.195	−0.128	−0.161	−0.129	−0.094	−0.230	0.016	–	−0.367	0.013
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.528)		(0.000)	(0.599)
RISK	0.036	−0.034	0.022	0.003	−0.039	−0.246	0.033	−0.379	–	0.030
	(0.151)	(0.176)	(0.384)	(0.917)	(0.127)	(0.000)	(0.188)	(0.000)		(0.236)
GROW	0.057	0.055	0.056	0.088	0.041	−0.002	0.008	0.057	−0.012	–
	(0.024)	(0.030)	(0.028)	(0.000)	(0.104)	(0.952)	(0.765)	(0.025)	(0.645)	

Pearson Correlations are displayed in the top right, Spearman correlations are displayed in the bottom left. *p*-values associated with the correlations are in parenthesis.

Dependent Variables
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Dependent variables are based on 1998 values.
Independent variables are three year averages based on 1995 to 1997 values.

long-term leverage, outside financing and bank financing, the coefficients will be the same sign as leverage, although the magnitudes will most likely vary.

The results of the OLS regression between the five dependent variables and the independent variables with varying controls for industry are reported in Table 3. Evidence from SME studies is mixed as to whether industry membership results in differences within the firms financing and capital structure (Scherr *et al.*, 1993; Jordan *et al.*, 1998; Coleman and Cohn, 1999; Michaelas *et al.*, 1999). The problems with drawing inferences from these studies, include the varying use of other control variables between studies and the different proxy for industry effects employed. Consequentially, industry may be proxying the securability of assets or asset risk, depending upon the choice of variables included in the empirical models. To ensure that the findings are not significantly affected by industry influences the multivariate analyses in Table 3 include tests both without industry controls and with industry controls, using one-digit ANZSIC groupings. As shown, the control of industry group in the regressions had limited effect on the inferences found, although there was some limited support that including industry effects significantly increased the explanatory power of the model. Given the limited influence of industry effects the discussion will focus on the regression without industry controls, although the discussion can be readily applied for the industry controlled regressions.

The relationship between firm size and leverage varies across the remaining three capital structure and financing variables. From Table 3 a ten-fold increase in the size of the firm corresponds to a 3.2 per cent increase in the leverage of the sample. A positive relationship is also found for long-term leverage, consistent with information asymmetries and transaction cost arguments limiting the attractiveness of debt, in particular long-term debt. However, there is limited support for *SHOR*, *OUT* and *BANK* being influenced by firm size. This suggests that the nature of financing, such as duration, rather than the source of financing may be causing the underlying affect upon capital structure.

Examining *NONA*, an extra 10 per cent of fixed assets leads to a reduction of leverage of 1.4 per cent. This is the opposite predicted by finance theory. An explanation for this result can be found by examining the effect of *NONA* on long and short-term leverage. In particular, for an extra 10 per cent of fixed assets, long-term leverage is increased by 2.2 per cent, while short-term leverage is decreased by 3.7 per cent. The inverse relationship between non-current assets and short-term leverage is consistent with firms matching their duration of assets and liabilities. Given the larger proportion of short-term debt over long-term debt most likely explains why the coefficient for *NONA* on firm leverage is negative. The relationship between *NONA* and bank financing is significantly positive, as predicted, however, the relationship between *NONA* and outside financing is actually negative. This discrepancy between these two financing variables suggests that banks place more weight upon the fixed assets of the firm than other financiers, and that these other outside financiers do not tend to rely on fixed assets to reduce agency costs. Alternatively, the firm may

Table 3
Regressions with and without industry control variables (n = 1,555)

	LEV		LONG		SHOR		OUT		BANK	
Variable	N	I	N	I	N	I	N	I	N	I
SIZE	3.236	3.430	2.865	2.998	0.371	0.433	1.187	1.249	0.118	0.774
	(1.175)	(1.205)	(0.858)	(0.882)	(1.058)	(1.085)	(1.127)	(1.154)	(0.893)	(0.915)
	[0.006]	*[0.004]*	*[0.001]*	*[0.001]*	*[0.726]*	*[0.690]*	*[0.293]*	*[0.280]*	*[0.895]*	*[0.398]*
NONA	−14.419	−13.690	22.230	21.691	−36.649	−35.650	−6.816	−6.370	16.470	15.160
	(2.820)	(2.964)	(2.058)	(2.170)	(2.539)	(2.669)	(2.706)	(2.840)	(2.143)	(2.250)
	[0.000]	*[0.000]*	*[0.000]*	*[0.000]*	*[0.000]*	*[0.000]*	*[0.012]*	*[0.025]*	*[0.000]*	*[0.000]*
ROA	−33.543	−33.779	−11.657	−11.821	−21.886	−21.958	−21.317	−19.184	−9.978	−10.366
	(5.193)	(5.251)	(3.791)	(3.845)	(4.677)	(4.728)	(4.984)	(5.032)	(3.948)	(3.987)
	[0.000]	*[0.000]*	*[0.002]*	*[0.002]*	*[0.000]*	*[0.000]*	*[0.000]*	*[0.000]*	*[0.012]*	*[0.009]*
RISK	−0.940	−0.837	−0.863	−0.784	−0.078	0.0528	−0.835	−0.675	−1.748	−1.663
	(1.400)	(1.405)	(1.022)	(1.028)	(1.261)	(1.265)	(1.344)	(1.346)	(1.064)	(1.066)
	[0.502]	*[0.551]*	*[0.399]*	*[0.446]*	*[0.951]*	*[0.967]*	*[0.534]*	*[0.616]*	*[0.101]*	*[0.119]*
GROW	13.675	12.873	3.775	4.092	9.900	8.781	13.886	14.448	3.943	3.151
	(4.996)	(5.029)	(3.647)	(3.682)	(4.499)	(4.528)	(4.794)	(4.820)	(3.798)	(3.818)
	[0.006]	*[0.011]*	*[0.301]*	*[0.267]*	*[0.028]*	*[0.053]*	*[0.004]*	*[0.003]*	*[0.299]*	*[0.409]*
Constant	51.279	47.440	−6.542	−7.522	57.821	54.962	37.856	35.909	12.969	8.224
	(8.116)	(8.325)	(5.925)	(6.095)	(7.309)	(7.496)	(7.789)	(7.978)	(6.170)	(6.320)
	[0.000]	*[0.000]*	*[0.270]*	*[0.217]*	*[0.000]*	*[0.000]*	*[0.000]*	*[0.000]*	*[0.036]*	*[0.193]*
R^2	0.073	0.082	0.081	0.084	0.146	0.154	0.028	0.040	0.042	0.054
Adj R^2	0.070	0.074	0.078	0.076	0.143	0.146	0.025	0.031	0.039	0.045
F-statistics										
$\beta = 0$	24.515***	9.830***	27.298***	10.152***	52.670***	20.013***	9.003***	4.595***	13.711***	6.274***
$\beta_{INDUSTRY} = 0$	1.622		0.657		1.701		2.114*		2.094*	

Standard errors are displayed in parentheses below coefficients. *p*-values are given in italics.
*** = significant at 0.001; ** = significant at 0.01; * = significant at 0.05
N = No industry dummies included in model; I = Industry dummies included in model.

have to use alternative financing sources due to the bank's decreased willingness to finance as tangibility decreases.

Consistent with pecking order arguments, in all five regressions, the coefficient for *ROA* is negative and significant. The strongest effect appears to be for leverage, while the smallest effect of the five variables is for bank financing. The coefficient between profitability and bank financing, in conjunction with the coefficient between asset structure and bank financing suggests that banks are substantially more focused upon firm assets than firm operations, compared to the firms' other financing sources. *GROW* is positive for all five dependent variables and significant for leverage, short-term leverage and outside financing. Interestingly, bank finance, while positive, was not significant suggesting that firms that grow appear to use other sources of outside financing to support their growth. The analyses were replicated using the 1997 one-year lagged variables instead of the three-year average, with the exception of *RISK* which was estimated again over a three-year period. The results from this analysis were very similar to the three-year average results.[6]

Finally there is no support of *RISK* influencing either the level of debt or the financing of SMEs, with the coefficients for risk on *LEV*, *OUT* and *SHOR* actually being positive, although not significant at conventional levels. Given these counter-intuitive findings, this raises the question as to whether risk is important in the capital structure of SMEs, or whether our risk measure is capturing this construct. To investigate the second issue, we re-ran the regressions in Table 3 with an alternative risk measure (*ALTRISK*) applied previously by Wald (1999) in examining relatively larger firms. *ALTRISK* is calculated as the standard deviation of the first differences in earnings before interest. The results of these regressions are displayed in Appendix B. Interestingly, the coefficients on the alternative risk measure are all negative, with *LEV*, *LONG* and *BANK* all exhibiting reasonably strong effects, consistent with the arguments that high risk firms should find debt less attractive. The particular use of risk proxy may explain why several studies have not found firm risk influencing the firms' capital structure decisions. In addition, all the other variables exhibit similar relationships to the regressions using the original *RISK* measure. As the use of *ALTRISK* was determined ex-post, we will exclude its use for the remainder of the paper.

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[6] In addition to OLS we applied a tobit specification to ensure that the direction or the magnitudes of the effects are not spuriously created due to the choice of specification employed. Overall the tobit specification provided similar inferences across the various variables and financing choices. The one exception being the negative coefficients between firm size and all the financing variables except long-term financing. Therefore the results as discussed, in particular between long-term financing and size are robust to the tobit specification, with the other variables which were insignificant becoming on occasion significantly negative. This suggests that aside from long-term leverage, scale effects appear to be a limited influence upon the capital structure of SMEs.

5.3. Interaction between size and financing

While this study has focused on a selection of firms within the small and medium sized classification, there is a possibility that the relationships between the financing and firm characteristics do vary by size within the sample. In particular, the same influences that may cause differences between SMEs and larger listed firms, may also affect relationships within the SME group, due to the wide variation of sizes present. To empirically examine the presence of size interaction effects, the sample was partitioned into two groups, above the sample median for total assets, and below the sample median for total assets. When firm size was above (below) the sample median, the dummy variable *BIG* (*SMALL*) was coded as '1', otherwise it was coded '0'. The regression model tested for each dependent variable Y is as follows:

$$\begin{aligned} Y = {} & \beta_0 + \beta_1 BIG + \beta_2 BIG{*}SIZE + \beta_3 SMALL{*}SIZE + \beta_4 BIG{*}NONA \\ & + \beta_5 SMALL{*}NONA + \beta_6 BIG{*}ROA + \beta_7 SMALL{*}ROA \\ & + \beta_8 BIG{*}RISK + \beta_9 SMALL{*}RISK + \beta_{10} BIG{*}GROW \\ & + \beta_{11} SMALL{*}GROW + \beta_{12\text{to}20} ANZSIC(3,\ 4,\ 5,\ 6,\ 7,\ 8,\ 9,\ 10,\ 11) \end{aligned} \quad (2)$$

This structure allows the independent variables to vary, but holds the industry effects fixed across size. The results can be interpreted as if two separate studies were undertaken with different size criteria employed, with control of overall industry effects. The regressions with interaction effects between firm size and the dependent variables are reported in Table 4. *SIZE* appears to exhibit a similar effect across size groups, with leverage positively related to size. The relationship between *NONA* and all financing variables appears to be consistent across size groups for all variables. In addition, *GROW* appears to be fairly consistent across size groups, with the exception being the non-significant negative coefficient on bank financing. *ROA* consistently has negative coefficients for both *BIG* and *SMALL* firms, however the magnitudes do vary across size groups resulting in some significant coefficients. Finally, *RISK* is only significant for *BIG* firms in regard to the leverage variables, again in the opposite direction to that hypothesised. Interestingly, the relationship between *RISK* and the proportion of bank financing for the *SMALL* firms in the sample suggests that higher risk reduces the use of bank financing. Therefore, aside from size, the influence of the variables upon the capital structure choice appear to be homogenous across the sample. This suggests that the extreme firms of the sample, being small or large, are not driving the inferences found.

6. Implications and limitations

The clear implication from this study is the relevance of financial theories of capital structure and financing applying to Australian SMEs. Generally the

Table 4
Regressions with size interaction effects and industry controls (n = 1,555)

	LEV		LONG		SHOR		OUT		BANK	
Variable	BIG	SMALL	BIG	SMALL	BIG	SMALL	BIG	SMALL	BIG	SMALL
SIZE	0.261	9.132	3.093	6.088	−2.832	3.045	−2.171	6.890	−2.335	4.804
	(3.240)	(2.101)	(2.371)	(1.537)	(2.925)	(1.897)	(3.101)	(2.011)	(2.459)	(1.595)
	[0.936]	*[0.000]*	*[0.192]*	*[0.000]*	*[0.333]*	*[0.109]*	*[0.484]*	*[0.001]*	*[0.343]*	*[0.003]*
NONA	−11.708	−15.794	27.377	19.127	−39.085	−34.921	−4.693	−8.182	13.068	15.896
	(4.994)	(3.577)	(3.654)	(2.618)	(4.509)	(3.230)	(4.781)	(3.424)	(3.791)	(2.716)
	[0.019]	*[0.000]*	*[0.000]*	*[0.000]*	*[0.000]*	*[0.000]*	*[0.326]*	*[0.017]*	*[0.001]*	*[0.000]*
ROA	−40.771	−29.984	2.127	−15.532	−42.898	−14.452	−32.696	−13.194	−13.643	−8.903
	(10.051)	(6.234)	(7.354)	(4.561)	(9.073)	(5.628)	(9.620)	(5.967)	(7.630)	(4.732)
	[0.000]	*[0.000]*	*[0.772]*	*[0.001]*	*[0.000]*	*[0.010]*	*[0.001]*	*[0.027]*	*[0.074]*	*[0.060]*
RISK	2.133	−1.917	2.001	−2.143	0.133	0.227	1.799	−1.381	0.688	−2.636
	(2.289)	(1.782)	(1.675)	(1.304)	(2.066)	(1.609)	(2.191)	(1.706)	(1.738)	(1.353)
	[0.352]	*[0.282]*	*[0.232]*	*[0.101]*	*[0.949]*	*[0.888]*	*[0.412]*	*[0.419]*	*[0.692]*	*[0.052]*
GROW	10.772	15.078	3.950	4.766	6.821	10.312	23.041	11.683	−6.849	8.548
	(8.902)	(6.074)	(6.513)	(4.444)	(8.036)	(5.483)	(8.521)	(5.814)	(6.758)	(4.611)
	[0.226]	*[0.013]*	*[0.544]*	*[0.284]*	*[0.396]*	*[0.060]*	*[0.007]*	*[0.045]*	*[0.311]*	*[0.064]*
BIG	44.867		3.885		40.982		47.348		40.157	
	(25.038)		(18.320)		(22.603)		(23.966)		(19.007)	
	[0.073]		[0.832]		[0.070]		[0.048]		[0.035]	
Constant	19.528		−19.676***		39.204		7.817		−12.403	
	(12.732)		(9.316)		(11.494)		(12.187)		(9.665)	
	[0.125]		[0.035]		[0.001]		[0.521]		[0.200]	
R^2	0.093		0.097		0.160		0.054		0.065	
Adj. R^2	0.081		0.085		0.149		0.042		0.053	
F-statistics										
$\beta = 0$	7.869***		8.199***		14.581***		4.366***		5.365***	
$\beta_{BIG} = \beta_{SMALL}$	3.107**		3.418**		1.767		3.717***		3.123**	

Standard errors are displayed in parentheses below coefficients. *p*-values are given in italics.
*** = significant at 0.001; ** = significant at 0.01; * = significant at 0.05
BIG = Firms above sample median; SMALL = Firms below sample median.

variables examined were consistent with static trade-off and pecking order arguments, with the only exception being risk; however, even the inferences associated with this variable were significantly affected by the choice of proxy employed to represent risk. The size interaction results show that the asset structure, profitability and growth findings are fairly robust across size groups within the SME classification.

This study has also highlighted the importance of distinguishing between long and short forms of debt when making inferences about capital structure choice. In particular, the role asset structure plays within the capital structure of the firm. Given the relatively high proportion of short term debt financing in these firms, overall leverage is negatively related to fixed assets. However, dividing the duration of debt into long and short components, it is found that long-term debt structure is positively related to long-term asset structure. This is intuitive both from a theoretical perspective and from a duration matching perspective.

Another interesting implication from this study is how bank financing differs from other outside financing. In particular, banks seem to place greater emphasis upon the asset structure of the firm, appear to issue finance to firms with lower risk and lend to firms which have lower growth. Of course, demand factors for bank financing internal to the firm may also be leading to these results. However, it does highlight the importance of firm characteristics, not just size, as affecting the firms capital structure and sources of finance particularly if you consider that firms with limited fixed or tangible assets, with higher risk, and high growth are particularly important to future economic welfare. This is consistent with anecdotal evidence that these firms cannot look to traditional sources for funds and require alternative sources such as bootstrap financing or private capital.

All the evidence presented needs to be considered within the study's limitations. Firstly, there are several factors that we are unable to test due to data constraints. Firm strategy has been shown by several researchers to be a potentially useful variable in explaining capital structure (Chaganti *et al.*, 1995; Jordan *et al.*, 1998). This study also cannot consider the use of collateral, different interest rates, or whether the owner had previous relationships with financiers. All of these factors influence the demand and supply of outside financing (Storey, 1994; Cressy, 1996). Also this study cannot address to what degree personal wealth influences financing behaviour (Avery *et al.*, 1998). This effect would potentially influence both motivation, growth and the relative use of outside financing. The extent to which any of these variables are correlated with the dependent financing variables represents an omitted variable bias. Whether these other variables do influence the results obtained in a significant way is therefore left to future research.

Longitudinal studies investigating changes over time in firm financing behaviour can provide greater insight into the financial choices of the firm. Unfortunately the limited number of time series and some lack of conformity in the

independent variables over time did not lend itself to such an analysis. Some recent research designs empirically testing pecking order arguments longitudinally offer some promise for better understanding of financing choice which may be addressed further by future research (Shyam-Sunder and Myers, 1999; Fama and French, 2000). Such opportunities are naturally available for larger more established firms, due to their longevity and more demanding reporting requirements.

This study only observes the final outcomes, namely the capital structure in place. The process by which the finances were obtained, the structure of the search and the degree to which the firm was affected by some form of credit rationing on the part of financial institutions are unable to be determined. However, all these questions are important and research has provided insight to how financial intermediaries allocate funds to firms. From the results presented here some inferences can be made indirectly, however, direct evidence of credit rationing, again cannot be undertaken by this study due to data constraints. Interviews and surveying techniques may also assist in establishing the role of finance matching within new and small firms. Do these firms deliberately match, or is it a consequence of firm events which naturally occur due to financiers only providing capital backed by securable assets, or as a function of the firms operating characteristics? Empirical analysis examining the composition of small firm balance sheets provides evidence consistent with matching, however, the explanation for such a result cannot be inferred without employing different methodology.

7. Conclusion

To conclude, the empirical evidence from this paper suggests that asset structure, profitability and growth are important influences upon SME financing and capital structure. There was also weaker evidence for size and risk influencing financing and capital structure choice. These results reconcile with the theories developed in finance to explain capital structure choice within the firm, including static trade-off arguments utilising bankruptcy, agency and tax costs and pecking order arguments which rely on information asymmetries. To date, there has been limited data available which allows for the application of such theories to SMEs. The BLS panel data provides a unique set of longitudinal data providing an insight into the financial structures of SMEs. The data analysis indicates that the traditional financing theories, typically developed to apply to large listed firms, appear to hold for Australian SMEs, which represent the majority of trading entities within the Australian economy.

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Appendix A
Summary of dependent variable construction from data set

	LEV	OUT	BANK
E – Working owners			
E – Non-working owners – family			
E – Non-working owners – non family			
E – Parent company	X	X	X
E – Venture and development capitalists		•	
E – Other unrelated businesses		•	
E – Employees (excluding directors)			
E – Other (including shareholders)	X	X	X
L – Trade and other creditors	•	•	
L – Loans from banks and financial institutions	•	•	•
L – Loans from parent company	X	X	X
L – Loans from individuals involved & their families	•		
L – Loans from unrelated businesses	•	•	
L – Loans from other individuals	•	•	
L – Deposits and other borrowings	•		
L – Outstanding claims	•		
L – Unearned premiums	•		
L – Other loans	•	•	
L – Bank overdraft	•	•	•
L – Bank bills and short term facilities	•	•	•
L – Provisions	•		
L – Other	•		

Long-term financing (*LONG*) and short-term financing (*SHOR*) were determined by respondents as a percentage of total leverage.
X = All firms with non-zero values were excluded from final sample.

Appendix B
Regressions using alternative risk variable (*ALTRISK*) without industry control variables (n = 1,555)

Variable	LEV	LONG	SHOR	OUT	BANK
SIZE	2.493	2.604	−0.111	1.006	0.419
	(1.167)	(0.853)	(1.052)	(1.122)	(0.889)
	[0.033]	*[0.002]*	*[0.916]*	*[0.370]*	*[0.638]*
NONA	−14.798	22.062	−36.860	−6.949	16.481
	(2.819)	(2.602)	(2.542)	(2.709)	(2.148)
	[0.000]	*[0.000]*	*[0.000]*	*[0.010]*	*[0.000]*
ROA	−29.327	−8.831	−20.497	−18.758	−6.301
	(4.713)	(3.444)	(4.249)	(4.529)	(3.591)
	[0.000]	*[0.010]*	*[0.000]*	*[0.000]*	*[0.080]*
ALTRISK	−5.065	−2.610	−2.456	−2.183	−1.281
	(2.117)	(1.547)	(1.909)	(2.035)	(1.614)
	[0.017]	*[0.092]*	*[0.199]*	*[0.284]*	*[0.427]*
GROW	13.650	3.728	9.922	13.837	3.802
	(4.986)	(3.644)	(4.496)	(4.792)	(3.799)
	[0.006]	*[0.306]*	*[0.027]*	*[0.004]*	*[0.317]*
Constant	55.321	5.605	60.926	38.297	9.421
	(7.486)	(5.471)	(6.750)	(7.194)	(5.704)
	[0.000]	*[0.306]*	*[0.000]*	*[0.000]*	*[0.099]*
R^2	0.076	0.082	0.146	0.029	0.041
Adj R^2	0.073	0.079	0.144	0.026	0.038
F-statistics					
$\beta = 0$	25.653***	27.761***	53.146***	9.160***	13.281***

Standard errors are displayed in parentheses below coefficients. *p*-values are given in italics.
*** = significant at 0.001; ** = significant at 0.01; * = significant at 0.05

Dependent Variables
LEV = Liabilities divided by assets
LONG = Long-term liabilities divided by assets
SHOR = Short-term liabilities divided by assets
OUT = Outside financing divided by assets
BANK = Bank financing divided by assets

Independent Variables
SIZE = Log 10 of total assets
NONA = Non-current assets divided by total assets
ROA = Return on assets before interest
ALTRISK = Standard deviation of first differences in earnings before interest
GROW = Growth in sales

Dependent variables are based on 1998 values.
Independent variables are three year averages based on 1995 to 1997 values.

Supplement 1
Selection Criteria and Sample Size

	N
Firms that have existed for the four year period ending 1998	3,093
Firms that had positive sales for the sample period	2,962
Firms that had no missing data	2,862
Firms that had assets between $500 and $25,000,000	2,697
Non-mining firms	2,686
Firms that have no parent financing	2,079
Firms that have no shareholder financing	1,871
Firms that had between 0–100% leverage	1,555

Supplement 2
Descriptive statistics of the raw independent variables (n = 1,555)

	Mean	Standard Deviation	25%	Median	75%
Independent Variables					
SIZE	1623.16	2900.18	163.00	491.67	1729.67
NONA	0.4630	0.2731	0.2259	0.4427	0.6833
ROA	0.3624	1.6041	0.0696	0.1519	0.2900
RISK	3.5660	59.3677	0.3251	0.6389	1.2190
GROW	0.2366	3.3010	−0.0110	0.0621	0.1563

Independent Variables
SIZE = Total assets in 000's
NONA = Non-current assets divided by total assets
ROA = Return on assets before interest
RISK = Coefficient of variation in profitability
GROW = Growth in sales

Independent variables are three year averages based on 1995 to 1997 values.

As Supplement 2 shows, many of the independent variables appear to have outliers present, as demonstrated by the relatively high standard deviations, and the differences between the mean and medians. The transformation of the independent variables, did reduce the influence of the outliers as demonstrated by the lower standard deviations and reduced variation between the mean and medians in Table 1. In addition, the similarities in the quartiles between the raw and transformed variables suggests that the general characteristics of the independent variable's distributions has not been substantially effected.

Supplement 3
Means of financing variables by industry groups (n = 1,555)

	N	LEV	LONG	BANK
Manufacturing	624	0.5548	0.1738	0.1667
Construction	112	0.5837	0.1486	0.2252
Wholesale	234	0.6344	0.1454	0.1422
Retail	174	0.6078	0.1935	0.2186
Accommodation and Restaurants	40	0.5205	0.2385	0.2363
Transportation and Storage	56	0.5767	0.2310	0.2589
Finance and Insurance	38	0.5927	0.1692	0.1929
Property and Business Services	228	0.5470	0.1777	0.1793
Cultural and Recreational Services	14	0.4298	0.1248	0.1712
Personal and Other Services	35	0.4229	0.2042	0.2508

Dependent Variables
LEV = Liabilities divided by assets
LONG = Long-term liabilities divided by assets
BANK = Bank financing divided by assets

Supplement 3 provides mean leverage, long-term leverage and bank financing by one-digit ANZSIC code. As the Table shows wholesale and retail firms have the highest levels of debt to assets, while cultural-recreational and personal-other services firms have the lowest, with the mean levels of leverage varying between .6344 to .4229 across industry groups. Accommodation-restaurant and transportation-storage firms have the highest mean proportion of long-term leverage. Also of interest from the leverage industry means, is the relative high proportion of short-term debt utilised by wholesale firms which is most likely matched with their significant holdings of short-term inventories and other assets. Transportation-storage firms have the highest proportion of bank financing, although both personal-other services and construction firms do appear to have high levels of bank financing relative to their leverage and long-term leverage respectively.