Financial Policy and Capital Structure Choice in U.K. SMEs: Empirical Evidence from Company Panel Data

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ABSTRACT. This article utilises up-to-date financial panel data, and investigates the capital structure of small and medium sized enterprises (SMEs) in the U.K. Different capital structure theories are reviewed in order to formulate testable propositions concerning the levels of debt in small businesses, and a number of regression models are developed to test the hypotheses.

The results suggest that most of the determinants of capital structure presented by the theory of finance appear indeed to be relevant for the U.K. small business sector. Size, age, profitability, growth and future growth opportunities, operating risk, asset structure, stock turnover and net debtors all seem to have an effect on the level of both the short and long term debt in small firms. Furthermore, the paper provides evidence which suggest that the capital structure of small firms is time and industry dependent. The results indicate that time and industry specific effects influence the maturity structure of debt raised by SMEs. In general terms, average short term debt ratios in SMEs appear to be increasing during periods of economic recession and decrease as the economic conditions in the marketplace improve. On the other hand, average long term debt ratios exhibit a positive relationship with changes in economic growth.

1. Introduction

Since the Modigliani and Miller (1958) debt irrelevance proposition financial economists have advanced a number of leverage relevance theories to explain the variation in debt ratios across firms. In some theories the existence of taxes and bankruptcy costs makes debt relevant (DeAngelo and Masulis, 1980). In other theories the relevance is due to information asymmetry – managers have information that investors do not have (Myers, 1984; Ross, 1977). A third relevant theory is agency theory advanced by Jensen and Meckling (1976), which is derived from the conflict between corporate managers, outside stockholders, and bondholders.

The general result from the various capital structure studies is that the combination of leverage related costs and the tax advantage of debt, produces an optimal capital structure below 100% debt financing, as the tax advantage is traded against the likelihood of incurring bankruptcy costs. Although, this theoretical result is now widely recognised, the question that arises is whether or not the various gearing related costs and benefits are economically significant enough to have an appreciable impact on optimal capital structure.

This question gave rise to a number of empirical results in which observed capital structures were related to firm characteristics that were assumed to reflect these costs and benefits, such as firm size, profitability, growth rate, firm risk, and industry characteristics (e.g. Marsh, 1982; Bradley et al., 1984; Kester, 1986; Titman and Wessels, 1988; to mention just a few). However, most empirical studies on capital structure use data for firms that would be classified as large by any definition of business size (Van der Wijst and Thurik, 1991; Chittenden et al., 1996a; Jordan et al., 1988 are notable exceptions). Theoretical frameworks typically use illustrations and causal empirical evidence involving large firms.

However, Ang (1992) differentiates the problems of finance of small privately held firms from their larger counterparts. He explains that small businesses, thought not concerned with

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the problems and opportunities associated with publicly traded firms, have different complexities, such as shorter expected life, presence of estate tax, intergenerational transfer problems, and prevalence of implicit contracts. In agreement with Pettit and Singer (1985), he emphasises that some standard problems like agency and asymmetric information are also more complex.

Nevertheless, only a limited amount of research has focused on small, growing, entrepreneurial companies and the factors affecting the capital structure of these firms. It would be fair to say that theoretical and empirical capital structure research has ignored the small business sector. However, this is an important omission because financial policy and capital structure of small firms is a major area of policy concern, and much of the work, particularly on the failure of small firms, has identified financial leverage as a major cause of decline (Keasey and Watson, 1987; Storey et al., 1988; Lowe et al., 1991).

In this paper, we attempt to apply the theory of capital structure in the small business sector, and develop testable hypotheses that examine the determinants of capital structure is small firms (independent small privately held companies with less than 200 employees). As these determinants of capital structure refer to the different theoretical attributes, which cannot be adequately measured, proxy variables have to be used in any empirical investigation.

The problem with this approach is that in every empirical analysis very important determinants of capital structure have to be estimated in a rather arbitrary manner, or, even worse, simply have to be omitted all together. This, however, may bias the results of the analyses. This becomes a very significant problem in small business empirical research, where many variables have to be omitted, due to the lack of available data.

In this study we attempt to extend empirical work on capital structure by utilising extensive panel data of U.K. small firms for a period of ten years (1986–1995) from all the sectors of the economy. The panel character of the data, permits the use of statistical techniques that reduce or avoid the omitted variables bias.

2. The application of the theory of capital structure to small firms

Since Modigliani and Miller debt irrelevance propositions, financial economists have advanced a number of leverage relevance theories by relaxing the perfect capital market assumption of the original Modigliani and Miller paper. Now, some 40 years later, the theory of capital structure is extensive and can be classified into three categories: tax based theories; agency cost theories; asymmetric information and signalling theories. These market imperfections have been brought forward as determinants of capital structure, which refer to the costs and benefits associated with financial contracting. However, these theories make no distinction between small and large firms. In fact, Ang (1991) points out that the theory of finance was not developed with the small business in mind. In this section, we review the different capital structure theories and attempt to relate the different theoretical attributes to small firms in order to formulate testable propositions concerning the levels of debt in small businesses.

2.1. *Taxes and bankruptcy costs*

Tax based theories argue that tax and bankruptcy considerations are a primary force influencing capital structure decisions. As debt interest shields income from taxation, profitable firms with few non-debt tax shields should use more debt than less profitable firms (DeAngelo and Masulis, 1980). According to these theories, tax paying firms would be expected to substitute debt for equity, at least up to the point where the probability of financial distress starts to be important. However, in practice firms do not follow this policy. The lack of maximum use of debt is particularly apparent in small firms, with survey results (e.g. Ray and Hutchinson, 1983) showing that many small firms do not use any debt.

As discussed by McConnell and Pettit (1984) and Pettit and Singer (1985), smaller firms are expected to be less profitable and to have less use for tax shields than large firms. In addition, the greater potential for small business bankruptcy (which increases the financial risk of debt), as discussed by these authors, implies that smaller firms should use less debt than larger counterparts.

Furthermore, at least some small firms face lower marginal tax rates than larger firms, which implies that smaller organisations derive less benefit from the tax shelter of deductible corporate interest (McConnell and Pettit, 1984; Ang, 1991, 1992). As such, higher bankruptcy costs and lower tax benefits, would work in the direction of reducing corporate small business debt below that adopted by otherwise equivalent large firms. Thus our first two hypotheses are:

H1: Effective tax rate will be positively related to gearing
H2: Non-debt tax shields will be negatively related to gearing

2.2. *Agency costs*

More recently, there has been a movement from the traditional tax-bankruptcy cost argument towards a consideration of agency costs as the major determinants of gearing (Jensen and Meckling, 1976; Myers, 1977). Significant agency costs arise from the fundamental conflict of interest between stockholders and bondholders. The consistent message of agency models is that these conflicts create incentives for stockholders to take actions that benefit themselves at the expense of bondholders and that do not necessarily maximise firm value. Hence, the latter may insist on various types of protective covenants and monitoring devices in order to protect themselves.

Myers (1977) argues that this sort of problem is especially serious for assets that give the firm the option to undertake growth opportunities in the future. The greater the firm's investment in such assets the less it would be debt financed, indicating a negative relationship between gearing and growth opportunities. However, Myers (1977), also points out that this agency problem is mitigated if the firm issues short-term rather than long-term debt. This suggests that short-term debt ratios might actually be positively related to growth rates if growing firms substitute short-term financing for long-term borrowing. We feel that Myers' (1977) proposition is more applicable in the small business context where the trade-off between independence and availability of finance is likely to be highlighted and where much debt is of a short term nature. Our next two hypotheses are:

H3: Past growth will be positively related to gearing
H4: Future growth opportunities will be positibely related to gearing

Barnea et al. (1981) have pointed out that agency problems are more severe whenever, the level of asymmetric information is greater, the agent has the capacity and incentive to affect wealth transfers between parties and the corporate contract, and the agent's partial ownership allows him to consume firm assets while paying less than the sum of the individual costs to the firm's principals. As a result we could expect agency costs to be higher in smaller firms as a small business owner/manager is likely to put his own and his venture's interest first, especially in the early years when survival is at stake.

Furthermore, solutions to agency problems are relatively more expensive to small businesses, thus raising the cost of transactions between small businesses with their creditors, shareholders and other stockholders. Monitoring could be more difficult and expensive for small firms because they may not be required to disclose much, if any, information, and therefore, will incur significant costs in providing such information to outsiders for the first time. Moral hazard and adverse selection problems may well be greater for small firms because of their closely held nature. Furthermore, bonding methods such as incentive schemes could be more difficult to implement for such firms.

However, raising debt secured by property with known values avoids these costs. In fact, Stiglitz and Weiss (1981) argue that banks respond to both adverse selection and moral hazard by seeking collateral. In principle, collateral overcomes the problems of both moral hazard and adverse selection, with the rate of interest playing its traditional role of clearing the market place. Binks et al. (1988) point out that, in the U.K., it is common for lenders to require collateral or to offer loans only if they are secured. It would therefore be expected that firms which possess fixed assets with a high collateral value will have easier access to external finance and probably a higher level of debt in their capital structure relative to firms with lower levels of collateralisable assets. Hence, our next hypothesis:

H5: Asset structure will be positively related to gearing

Many authors (Bradley et al., 1984; Kester, 1986 and Titman and Wessels, 1988, amongst others), have suggested that a firm's optimal level of gearing is a decreasing function of the volatility of earnings (as a measure of operating risk) due to agency and bankruptcy costs. The variability of the firm's future income is the chief factor in *ex ante* estimates of its ability to meet fixed charges. As a result, one may anticipate that operating risk is negatively correlated with the percentage of debt in a firm's capital structure. Our next hypothesis is:

H6: Operating risk will be negatively related to gearing

2.3. *Asymmetric information costs*

The introduction into economics of the explicit modelling of private information has made possible a number of approaches to explaining capital structure. In these theories, firm managers or insiders are assumed to possess private information about the characteristics of the firm's return stream or return opportunities. In one set of approaches, choice of the firm's capital acts as a signal to outside investors of the information held by insiders. This stream of research began with the work of Ross (1977) and Leland and Pyle (1977). In another approach, capital structure is designed to mitigate inefficiencies in the firm's investment decisions that are caused by the information asymmetry between managers (insiders) and investors and creditors (outsiders) (Myers, 1984).

Pettit and Singer (1985) discussed problems of asymmetric information and agency costs which affect the cost and availability of credit for small businesses. They explain that smaller firms generally have higher levels of asymmetric information since the quality of their financial statements vary. Although audited financial statements may be preferred by outsiders, small firms may find that these costs are prohibitive and alternative sources of formal information are inadequate.

The main conclusion from the asymmetric information theories is the pecking order hypothesis (Myers, 1984), which suggests that firms finance their needs in a hierarchical fashion, first using internally available funds, followed by debt, and finally external equity. This preference reflects the relative costs of the various sources of finance, due to the existence of information asymmetries. It could be argued that the pecking order hypothesis, is particularly relevant for small firms since the costs to them of external equity may be higher than for large firms (Pettit and Singer, 1985). Furthermore, a stock market flotation would widen the share ownership of the firm, and could lead to loss of control by the original owner-managers or could even lead to a takeover. As such, the rational response of small businesses in such circumstances would be to avoid the use of external finance, and rely more heavily on retained profits and bank finance. Hence, our next hypothesis is:

H7: Profitability will be negatively related to gearing

Furthermore, Petersen and Rajan (1994) show that the availability of finance from institutions increases as the firm spends more time in a relationship with an institution as established banking relationships increase the availability of finance and reduce the cost of credit to firms. Petersen and Rajan show that leverage decreases with age, but increases with size. A natural explanation for this observation is that young firms tend to be externally financed while older tend to accumulate retained earnings. Our next hypothesis is:

H8: Age will be negatively related to gearing

Chittenden and Bragg (1997), argue that because shareholders interests and long-term loans are a smaller percentage of a small firms' liabilities, there appears to be less scope for accommodating late payment of receivables by increasing equity or long-term debt. As a result the two main avenues open to small firms suffering from late payments, are to increase short-term bank borrowing, or delay payments to creditors. However, it has also been shown by Chittenden and Bragg (1997), that delaying payments to creditors cannot be taken beyond a certain point, we can, therefore, expect small firms to increase short-term bank borrowing when suffering from late payments. Although, the effect of trade debtors and creditors on capital structure, are not mentioned in

the finance literature, we propose the following hypothesis:

H9: Net debots will be positively related to gearing

The central conclusions from the application of the capital structure theory to small firms, suggest proportionately less small business debt than that issued by larger firms due to generally: lower marginal corporate tax rates for very small firms; higher bankruptcy costs; greater agency costs, and; greater costs of resolving the larger informational asymmetries. While these propositions probably do not hold for all small businesses, they tend to argue that the net demand for firm debt would be less. These arguments do not suggest any form of availability or supply-side constraints on small business debt, yet they do offer reasons why the cost of debt might be somewhat greater and the extent of debt usage might be somewhat less in small firms (McConnell and Pettit, 1984). Our next hypothesis is:

H10: Size will be positively related to gearing

Myers (1984) suggest that since asset risk, asset type, and requirements for external funds vary by industry we could expect average debt ratios to vary from industry to industry as well. Similarly, Haris and Raviv (1991) point out that firms within an industry are more similar than those in different industries and that industries tend to retain their relative leverage rankings over time. However, there is a considerable disagreement concerning the strength of the industry effect. Balakrishnan and Fox (1993) conclude that the structural characteristics of industry are not nearly as important as the firm-specific aspects of risk and their implications. We therefore propose the following hypothesis to examine the industry effect on the capital structure of small firms:

H11: Industry effects have an influence on the capital structure of small firms

Recent figures by the British Bankers Association (BBA) showed that borrowing by the small business sector in the U.K. has fallen by 14% since 1991 when gearing ratios peaked due to the financial pressures exerted on small firms by the recession. Since the recession ended there has been a reduction in the external borrowing requirement of small firms, which have been able to rely more on retained earnings (Bank of England, 1998). The Bank of England suggest that this reliance may also have been accompanied by a reluctance of business owners to expose themselves again to a higher level of debt finance, following the problems experienced in the last recession. Furthermore, the Bank of England point out that deposits held by small businesses have increased. This could be due to the preference of small businesses owners to rely heavily on internal funds rather than incur the costs of borrowing. Alternatively, it could be that there is still concern among businesses that the current stable economic climate will not continue indefinitely (Bank of England, 1998). These observations indicate that the capital structure of small firms is sensitive to temporary economic downturns. This leads to our final hypothesis:

H12: Gearing ratios in small firms will vary over time and over different economic cycles

3. Data and variables

All the data used in this study was gathered from the Lotus One-Source Database of U.K. small firms. A total number of 3500 firms that satisfied the definitional and data requirements for the research were randomly selected. In an attempt to make the database as representative of the U.K. small business sector as possible, we selected firms from all the different industries of the economy making sure, however, that the number of firms selected from each industry is representative of the real size of the industry, based on the 1995 Department of Trade and Industry statistics (DTI, 1995); (See Table IV in the appendix).

The data utilised comprised the Profit and Loss accounts and Balance Sheets for the 3500 sample firms for 10 years (1986 to 1995); except in the case of firms that where less than ten years old, in which case data for all available years was collected. As some variables require three years of data, the first year for which we have panel data analysis is 1988, giving us a total of 20,500 cases. Thus, the data does not have a complete panel character as for some firms information is available for less than 10 years. However, this was inevitable as we wanted to included younger firms

in the analysis, as one of our hypotheses examines the effect of age on gearing. A descriptive analysis of the database is offered in Table IV in the appendix.

All firms in the sample are small independent private limited companies, with less than 200 employees. No pretence is made that the sample is representative in any ultimate sense. It includes only surviving small limited companies. This limitation must be acknowledged as the capital structure literature clearly states that high gearing may lead to bankruptcy. This implies that the sample is likely to exclude highly geared companies. On the other hand, simply because surviving small firms comprise a material component of the economy, their behavior has inherent importance.

3.1. *Estimation of dependent and explanatory variables*

All the variables used in the study are based on book values. Furthermore, because there is large variation on the size of firms, a direct comparison of these variables is impossible. To standardise our measures, we use a size-related denominator and compute ratios. Thus, where appropriate, we deflate the variables by total assets.

- AGE = Age of the firm at the time since date of incorporation.
- SIZE = Total assets (Titman and Wessels, 1988)
- PROFITABILITY = Ratio of pre-tax profits to total assets for a period of three years (Toy et al., 1974; Titman and Wessels, 1988).
- PAST GROWTH = Percentage increase of total assets in last three years (Chittenden et al., 1996a; Titman and Wessels, 1988).
- FUTURE GROWTH OPPORTUNITIES = The ratio of intangible assets to total assets. Intangible assets include: research and development expenditure, trademarks, patents and copyrights. Similar measures of future growth opportunities are used by Long and Malitz (1983) and Titman and Wessels (1988).
- OPERATING RISK = Operating risk is defined as the coefficient of variation in profitability over the whole period: 1998–1995 (Toy et al., 1974; Titman and Wessels, 1988).
- ASSET STRUCTURE = We use two measures for asset structure: One is the ratio of fixed assets to total (Chittenden et al., 1996a; Friend and Lang, 1988). The second variable used is the ratio of stock to total assets (Van der Wijst and Thurik, 1993).
- EFFECTIVE TAX RATE = We estimate the effective tax rate of our sample firms for each of the data periods (1998–1995) using the NatWest/Manchester Business School Tax Model. The NatWest/Manchester Business School Tax Model monitors over time the impact of the tax regime (income tax, corporation tax, national insurance tax, local business rates and compliance costs) on the small business sector (Chittenden et al., 1996b). Using the Model we estimate the corporation tax liability of our sample firms, taking into account tax loss carryforwards based on the U.K. tax regime over the period examined, and then divide that figure by pre-tax profits to derive the effective tax rate of the firm.
- NON-DEBT TAX SHIELDS = Following Bradley et al. (1984), depreciation charges are used to indicate non-debt tax shields. The ratio of depreciation charges to total assets is included in the analysis to indicate the tax advantage. This measure is also used by Titman and Wessels (1988) and Barton et al. (1989) amongst others.
- NET DEBTORS = The ratio of debtors less creditors to total assets.

In this study we use three different measures of gearing based on book values. We estimate separate variables for total debt, short term and long terms debt ratios. Following Remmers et al., 1975 and Ferri and Jones, 1975, the three dependent variables used are:

- TOTAL DEBT RATIO = Total debt to total assets,
- SHORT TERM DEBT RATIO = Short term debt to total assets, and,
- LONG TERM DEBT RATIO = Long term debt to total assets

Short term debt is defined as the portion of the company's total debt repayable within one year. This includes: bank overdraft, bank loans current portion, and other current liabilities. Long term debt is the total company's debt due for repayment beyond one year. This includes: long term bank

loans and other long term liabilities repayable beyond one year such as directors loans, hire purchase and leasing obligations.

These three variables allow us to examine influences on the maturity structure of debt as well as the total debt position of sample firms. There is likelihood that leverage related costs of short-term debt may differ from those of long-term debt. While firms may have separate polices with regard to short-term debt, there is likely to be some interaction between the levels of long term and short-term borrowing (Bennett and Donnelly, 1993). By examining both long-term and short-term measures of gearing we may be able to determine if the factors that influence short-term debt differ from those that determine long-term debt. A summary of the descriptive statistics of the different dependent an explanatory variables described above is offered in Table V in the appendix.

4. Method of analysis

In this study we utilise panel data analysis to empirical examine the hypotheses formulated above. Hsiao (1986), points out that panel data sets for economic research possess several major advantages over conventional cross-sectional or time-series data sets. First, panel data usually provide a large number of datapoints, increasing the degrees of freedom and reducing the collinearity among explanatory variables, hence improving the efficiency of econometric estimates (Hsiao, 1986). Furthermore, panel data are better able to study the dynamics of adjustment and are better able to identify and measure effects that are simply not detectable in pure cross-sections or pure time-series data (Baltagi, 1995).

The panel character of our data, permits the use of variable-intercept models that introduce firm type (industry) and/or time specific effects into the regression equations that reduce or avoid the omitted variables bias (Hsiao, 1986). One common issue that arise with variable-intercept models estimations is whether the individual effects are to be thought of as "fixed-effects" of "random-effects". Hsiao (1986) points out that, when inferences will be made about a population of effects from which those in the data are considered to be a random sample, then the effects should be considered random. Our data covers all ten industries of the U.K. economy, so the industries examined cannot be considered a small sample of a much larger population of industries. In this case, the fixed-effects models would be more appropriate than then random-effects one.

As such the hypotheses formulated above are tested by including the eleven explanatory variables in a number of Least Squares Dummy Variable (LSDV) models which are based on the fixed-effects assumption. Thus, for all but the first time period (1988), as well as for all but the first industry (Industry 1) a separate dummy variable is included in the regression equations (seven time and nine industry dummy variables), replacing the intercept. The dummy variables will capture the firm type (industry) and time specific-effects of the omitted as well as the included variables. The regression equations are estimated using the E-Views (Econometric Views) statistical package, which allows the computation of White Heteroskedasticity-Consistent Standard Errors and Covariance that accounts for heteroskedasticity, which is likely to occur in panel data analysis.

5. Results and discussion

The results of the LSDV analyses, are reported in Table I. For each variable, we also compute the ratio of the variable effect on short term debt ratio to the variable effect on long term debt ratio, to see to what extent the different explanatory variables influence the maturity structure of debt (these computations are presented in the fifth column of the table).

As can be seen in Table I, the regression coefficients of the marginal tax rate variable are not statistically significant in any of the three models, and are also negative, contrary to the expected positive relationship by the finance theory. Secondly, the coefficient of depreciation charges, as a proxy for the non-debt tax shields, are not significantly different from zero either for total debt and short term debt, while the coefficients are even positive contrary to the expected influenced of non-debt tax shields as predicted by DeAngelo and Masulis (1980). *Thus, our first two hypotheses H1 and H2 are rejected.*

Taken together these observations indicate that small business owners do not appear to consider

TABLE I
Estimated Least Squares Dummy Variable (LSDV) regression coefficients

Explanatory variables	Dependent variables			Ratio[#]
	Total debt	Short-term debt	Long-term debt	
Size	8.18E-07 (2.533) [0.011]	–2.10E-06 (–7.279) [0.000]	2.92E-06 (8.227) [0.000]	0.7 times
Age	–0.002 (–14.556) [0.000]	–0.001 (–9.280) [0.000]	–0.001 (–11.670) [0.000]	0.7 times
Profitability	–0.409 (–5.796) [0.000]	–0.161 (–3.342) [0.001]	–0.248 (–4.924) [0.000]	0.6 times
Growth	0.012 (6.154) [0.000]	0.008 (5.281) [0.000]	0.004 (4.207) [0.000]	1.9 times
Growth opportunities	0.422 (9.364) [0.000]	0.186 (5.134) [0.000]	0.235 (6.078) [0.000]	0.8 times
Risk	0.037 (2.820) [0.005]	0.028 (3.114) [0.002]	0.010 (1.929) [0.053]	2.8 times
Asset structure	0.313 (32.161) [0.000]	0.062 (7.660) [0.000]	0.252 (38.889) [0.000]	0.2 times
Stock level	0.359 (29.973) [0.000]	0.295 (28.944) [0.000]	0.063 (7.464) [0.000]	4.7 times
Non-debt tax Shields	0.015* (1.362) [0.173]	0.017* (1.552) [0.121]	–0.002 (–2.100) [0.036]	9.1 times
Marginal tax rate	–0.054* (–1.448) [0.149]	–0.026* (–0.943) [0.346]	–0.028* (–1.095) [0.274]	0.9 times
Net debtors	0.409 (30.253) [0.000]	0.375 (29.214) [0.000]	0.034 (4.813) [0.000]	10.9 times
Adjusted R^2	0.225	0.129	0.252	
F-Statistic	189.517 0.000	97.358 0.000	220.349 0.000	
Durbin-Watson	1.833	1.750	1.932	

(t-statistic) [probability].
* Not statistically different from zero at a 5% level of significance.
[#] 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).

tax effects in their short term capital structure decisions. However, the significant positive relationship between non-debt tax shields and long term debt ratios provide some limited evidence that tax considerations may become an important element in the longer term capital structure decisions in small businesses. It nevertheless, hard to say that a firm's tax status has predictable, material effects on its debt policy. Myers (1984) points out that is hard to classify firms by tax status without implicitly classifying them on other dimensions as well. He explains that firms with large tax loss carryforwards may also be firms in financial distress, which have high debt ratios almost by definition. Alternately, firms with high operating profitability, and therefore plenty of unshielded income, may also have valuable intangible assets and growth opportunities. Do they end up with a higher or lower than average gearing ratio? In the words of Myers (1984) it is "*hard to say*".

A negative relationship between effective tax rate and gearing in small firms is also reported by Jordan et al. (1998), who suggest this relationship indicates that a simpler mechanism may be at work in the small business sector. They propose

that the average amount of tax paid during the sample period influences the average level of debt during the period simply as the result of the effect on retained earnings.

Out next two hypotheses, H3 and H4, propose a positive relationship between gearing ratios in small firms and past growth and future growth opportunities. The positive coefficient estimates for the growth and future growth opportunities variables indicate that fast growing firms as well as firms characterised as having relatively large research and development expenditures, tend to have high gearing ratios. *These results provide strong support for H3 and H4*. A positive relationship between growth and gearing ratios in small firms is also reported by Chittenden et al. (1996a) and Jordan et al. (1998), although, both studies report the relationship not to be significant.

The positive coefficient of the growth variable for both short term and long term debt is consisted with the pecking order theory. Rapidly growing small firms are likely to have insufficient earnings to finance all of their growth internally. Given the reluctance of small business owners to issue equity, created by asymmetric information problems and control considerations as well as the relatively higher flotation costs, fast growing firms are likely to issue more debt. The results also point out that twice as much sort term debt will be raised compared to long term debt to finance growth. As can be seen in the fifth column of Table I, the magnitude of the growth effect on short term debt is 1.8 times larger than the magnitude of the growth effect on long term debt.

Our models also provide strong support for H5 concerning the relationship between asset structure and gearing. The results point out that a high fixed asset component and a high inventory level are associated with higher short term as well as long term debt. These results suggest that information asymmetries and agency problems are significant in the small business sector. Lenders are unwilling to lend to small firms, particularly because of the danger of asset substitution. In order to induce lenders to provide debt finance in the face of agency and asymmetric information problems, small firms provide collateral as a security of bank loans. Issuing debt secured by fixed assets or inventory with known values decreases information asymmetry and agency costs, making more debt available at a lower cost to small firms. As a result, small firms with a high proportion of fixed assets and high inventory levels are able to raise higher levels of debt finance.

Interestingly, the results point out that when small firms offer their fixed assets as collateral for debt finance, there is five times more chance than they will ask for long term finance, while the opposite is true for inventory. Note that the ratio of the asset structure and stock level effects on short term debt to the effect on the long-term debt is 0.2 and 4.7 times respectively. A positive relationship between asset structure and average gearing ratios in small firms is also reported by Jordan et al. (1998). Although our results show a positive relationship between asset structure and total debt, short term debt and long term debt ratios, Chittenden et al. (1996a) and Van der Wijst and Thurik (1993) report a negative effect of asset structure on short term debt ratios but a positive effect on long term debt ratios.

Our results indicate that small firms with higher operating risk tend to use more short term and long term debt. The observed positive relationship between risk and gearing contradicts our hypothesis and it is obviously counter intuitive. McConell and Pettit (1984) and Pettit and Singer (1985) theorise that bankruptcy costs will be higher in small firms, and would therefore expect, a negative relationship between risk and gearing. Nevertheless, Bradley et al. (1984), pointed out that in order to ensure a negative relationship between risk and gearing very significant costs of financial distresses are necessary. However, Ang et al. (1980) found that direct bankruptcy costs averaged about 5% of the liquidation value of 88 businesses that filed for bankruptcy between 1964 and 1978. Their study indicates that bankruptcy costs for small firm are not larger relatively than they are for large firms. According to our results, bankruptcy costs are not significant enough to ensure a negative relationship between risk and gearing.

Rather, as indicated by Long and Malitz (1985), the observed positive relationship between firm risk and gearing in small firms, suggests that the "moral hazard" problem outweighs the increased probability of bankruptcy. It follows that agency costs are lower in more risky firms, due to lower

underinvestment problems, allowing such firms to rely on higher gearing ratios. A positive relationship between risk and gearing in small firms is also reported by Jordan et al. (1998). They suggest that this positive relationship may be due to "distress" borrowing during a hostile economic environment. *Our results contradict our hypothesis H6, which we have to reject.*

As can been seen in Table I, profitability is negatively related to gearing providing some evidence for Myers' pecking order theory, which asserts that under conditions of asymmetric information firms will choose finance sources for their business in a particular order that minimises interference with ownership. This finding suggests that small business owners, prefer internal to external financing, as they tend to use retained profits as much as possible and then raise debt only when additional finance is essential. Since small firms will make use of internally generated funds as a first resort, those which make use of external funds will be those with a lower level of profit. Firms with higher profits will have more internal funds available and will, therefore, need to borrow less. *This provides strong support for H7.* A negative relationship between profitability and gearing in small firms is also found by Van der Wijst and Thurik (1993), Chittenden et al. (1996a) and Jordan et al. (1998).

Furthermore, the results also indicate that profitability affects the maturity structure of debt used in small firms, providing evidence for the preference of short term finance over long term finance in small businesses. As can be seen in Table I, the profitability effect is bigger on the long term debt ratios. Note that the ratio of the profitability effect on short term debt to the profitability effect on the long-term debt is 0.6 times. This observation suggests that as internal profits become available, long term finance will be substituted first by internal equity.

Support for the pecking order theory is also provided by the negative relationship between age and gearing. Young firms are externally financed exhibiting higher average gearing ratios compared to older firms that realise more profits and finance operations using accumulated internal sources. *We therefore accept H8.*

Furthermore, the positive coefficient of the net debtors variable suggests that small firms suffering from late payments tend to increase both short term and long term borrowing, to compensate for the inability to mitigate late payments from customers by delaying payments to creditors. *We therefore accept H9.* This observation may provide some evidence for the escalating problem of late payments in the U.K. as well as the increasing importance of factoring as short term finance in the small business sector (CSBRS, 1993). The results also indicate that debtors will be primarily financed with short term rather than long term finance. As it can be seen in Table I, the ratio of the net debtors effect on short term debt to the net debtors effect on the long-term debt is 10.9 times.

Finally, from the regression coefficients for the size variable (total assets) we can observe the existence of scale effects in the gearing ratios of sample firms. The positive relationship between size and total debt ratio indicates that the larger the firm the higher the gearing ratio it is able to achieve and maintain, providing some evidence for the higher financial barriers faced by smaller firms. *This provides strong support for H10.* A positive relationship between size and gearing is also reported by Van der Wijst and Thurik (1993) and Chittenden et al. (1996a).

Although, when short term and long term finance is taken together, smaller firms are lowered geared, this is driven by the significantly lower proportion of long term finance in their balance sheet, as short term debt ratios are in fact higher in smaller businesses. As can be seen in Table I, the effect of firm size on short term and long term debt ratios is of opposite sign, indicating that size influences pertain to the maturity structure of debt as well as to the overall level of debt. It is also interesting to note that the size effect is bigger on the long term debt ratio. Note that the ratio of the size effect on short term debt to the size effect on the long-term debt is 0.7 times. This suggest that as a firm grows larger, increases in long term finance will be proportionately larger than increases in short term finance.

It could be argued that this difference in financing practice may reflect the high transactions costs that smaller firms face when they issue long-term debt, and as a result they have to rely more heavily on short term finance, and in general, on lower total debt ratios than larger counterparts.

The LSDV models outlined in Table I include a number of dummy variables, for all but the first time period (1988) and all but the first industry (Industry 1), that replace the intercept. These regression coefficients and t-statistics of the industry dummies are presented in Table II. In the fifth column we present the ratio of the industry effect on short term debt ratio to the industry effect on long term debt ratio, to see to what extent the industry effect influences the maturity structure of debt. Furthermore, in Figure 1 we plot the coefficients of the nine industry dummies, obtained in the analyses of total, short term and long term debt, against the industry to which they refer (note that there are no values for Industry 1, as this is the omitted industry).

As can be seen in Table II almost all of the industry dummy coefficients are significantly different from zero at the 5% level of significance, indicating that industry exhibits a significant effect on the capital structure of small firms. Moreover, by looking at Figure 1 we can see that industry has an effect on the total level of debt in small firms as well as at the maturity structure of debt. Note that the difference between the magnitude of the industry effect on short term and long term debt varies across industries. *This provides strong support for H11.*

It is interesting to point out that, although the industry effect is bigger on short term debt ratios compared to long term debt ratios in all industries, this is especially true in the construction (Industry 3) and wholesale and retail trade (Industry 4) industries, where the ratio of the industry effect on short term debt to the industry effect on long term debt, is 9.6 and 11.2 times respectively (See Table II).

Table III presents the regression coefficients

TABLE II
Regression coefficients of industry dummies

Industry variables	Dependent variables			Ratio#
	Total debt	Short-term debt	Long-term debt	
1. Agriculture, Forestry, Mining	Omitted	Omitted	Omitted	Omitted
2. Manufacturing	0.128 (17.205) [0.000]	0.092 (16.146) [0.000]	0.035 (7.115) [0.000]	2.6 times
3. Construction	0.182 (25.709) [0.000]	0.165 (29.854) [0.000]	0.017 (3.687) [0.000]	9.6 times
4. Wholesale & Retail Trade	0.121 (16.262) [0.000]	0.111 (19.275) [0.000]	0.010 (1.992) [0.000]	11.2 times
5. Hotels & Restaurants	0.278 (23.409) [0.000]	0.200 (18.801) [0.000]	0.078 (7.813) [0.000]	2.6 times
6. Transport & Communication	0.220 (25.805) [0.000]	0.185 (26.698) [0.000]	0.034 (6.570) [0.000]	5.4 times
7. Finance	0.260 (14.320) [0.000]	0.168 (14.584) [0.000]	0.091 (5.817) [0.000]	1.8 times
8. Business Services	0.251 (33.353) [0.000]	0.186 (30.066) [0.000]	0.065 (12.726) [0.000]	2.9 times
9. Education, Health & Social Work	0.325 (22.154) [0.000]	0.179 (15.949) [0.000]	0.147 (13.933) [0.000]	1.2 times
10. Other	0.362 (20.470) [0.000]	0.287 (21.957) [0.000]	0.075 (6.410) [0.000]	3.8 times

(t-statistic) [probability].
* Not statistically different from zero at a 5% level of significance.
# The ratio of the industry effect on short term debt ratio to the industry effect on the long-term debt ratio (i.e. regression coefficient in short term debt model to regression coefficient in the long term model).

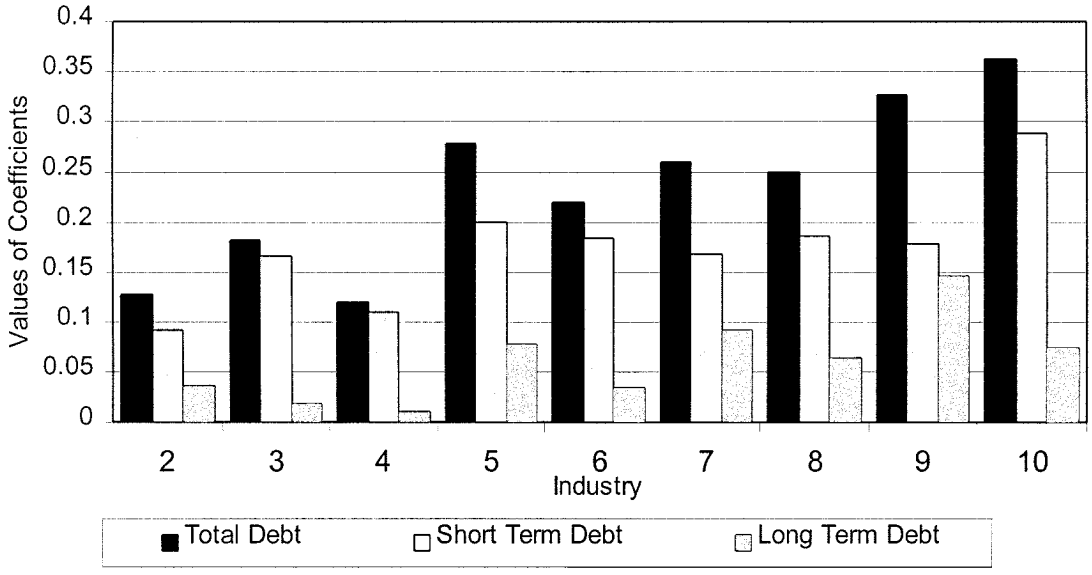

Figure 1. Coefficient of industry dummy variables for total, short and long term debt.

TABLE III
Regression coefficients of time dummies

Year	Dependent variables			Ratio[#]
	Total debt	Short-term debt	Long-term debt	
1988	Omitted	Omitted	Omitted	Omitted
1989	0.109 13.040 [0.000]	0.104 14.845 [0.000]	0.005* 0.864 [0.388]	22.6 times
1990	0.102 14.004 [0.000]	0.104 17.163 [0.000]	–0.0028* –0.396 [0.692]	57.4 times
1991	0.102 13.570 [0.000]	0.104 16.967 [0.000]	–0.002* –0.365 [0.715]	57.3 times
1992	0.102 13.402 [0.000]	0.095 15.703 [0.000]	0.007* 1.339 [0.181]	14.3 times
1993	0.095 13.197 [0.000]	0.086 15.047 [0.000]	0.008* 1.784 [0.074]	10.2 times
1994	0.090 13.180 [0.000]	0.076 14.309 [0.000]	0.014 2.998 [0.003]	5.6 times
1995	0.091 13.531 [0.000]	0.079 14.810 [0.000]	0.012 2.774 [0.006]	6.5 times

(t-statisic) [probability].
* Not stistically different from zero at a 5% level of significance.
[#] The ratio of the time effect on short term ratio to the time effect on the long-term debt ratio (i.e. regression coefficient in short term debt model to regression coefficient in the long term model).

and t-statistics of the time dummies included in the three LSDV models discussed above.

In Figure 2, we plot the coefficients of the seven time dummies, obtained in the analyses of total and short term debt, against the years they refer. Alternatively, Figure 2 plots the coefficients of the seven time dummies, obtained in the analyses of long term debt.[1] On the right axis of these two figures we plot the percentage change in real GDP over the period examined.

Figure 2, shows that there is a distinct pattern in the values of the time dummy coefficients for total and short term debt. This pattern is exhibiting a negative relationship with percentage change of real GDP. Note that this negative relationship is more evident for time dummies of short term debt (In fact the Pearson correlation coefficients between the percentage change in real GDP and the values of time dummies of total and short term debt are –0.551 and –0.721 respectively). The observed time structure in the values of the time dummies of total and short term debt indicates that economic growth (measured as the percentage change in real GDP) has a negative effect on gearing ratios of small firms. Average total debt and especially short term debt ratios in sample firms appear to be decreasing during economic booms periods and increasing during periods of economic recession, indicating how sensitive small business are to temporary micro-economic changes.

On the other hand, Figure 3, indicates that the opposite is true for long term debt. We can very clearly see that there is a monotonous positive relationship between the values of the time coefficients of long term debt and economic growth (The Pearson correlation coefficient between the percentage change in real GDP and the values of time dummies of long term debt is 0.805). This suggest that small firms tend to raise higher levels of long term debt the better are the economic conditions in the marketplace. These results suggest that time has an effect both on the maturity structure as well as the overall level of debt in small firms. In fact, as can be seen in Table III the time effect is much stronger on short term debt ratio compared to long term debt ratio. This is especially true for the recession period when the effect of time on short term debt is 50 times stronger than the time effect on long term debt.

Integrating the results depicted in Figure 2 and 3 indicates that small businesses appear to be relying less heavily on short term debt and more on long term debt the faster the growth in

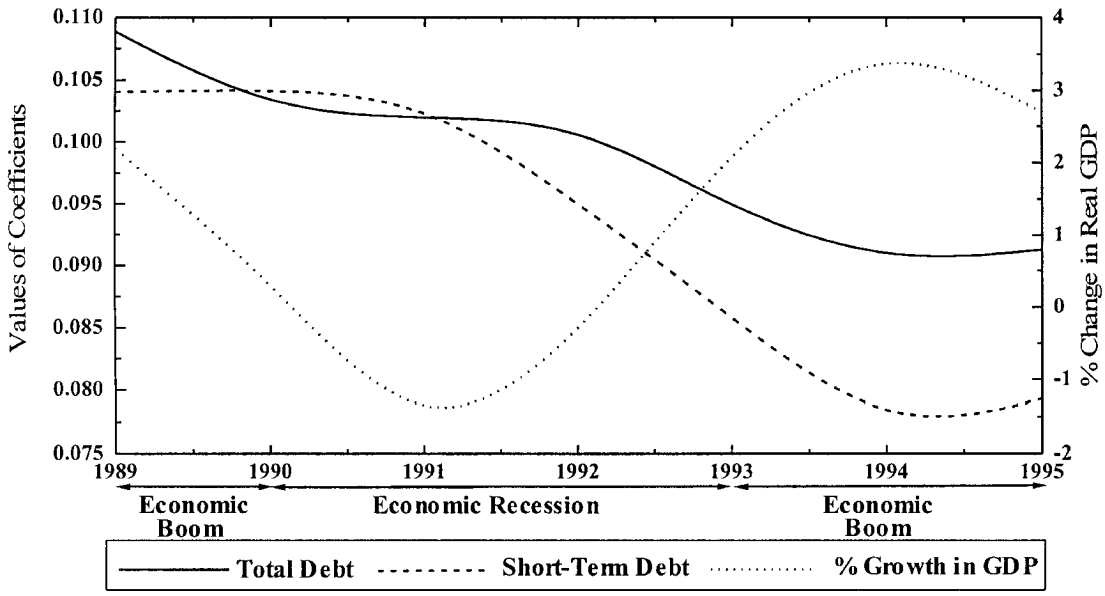

Figure 2. Coefficients of time dummy variables for total and short term debt.

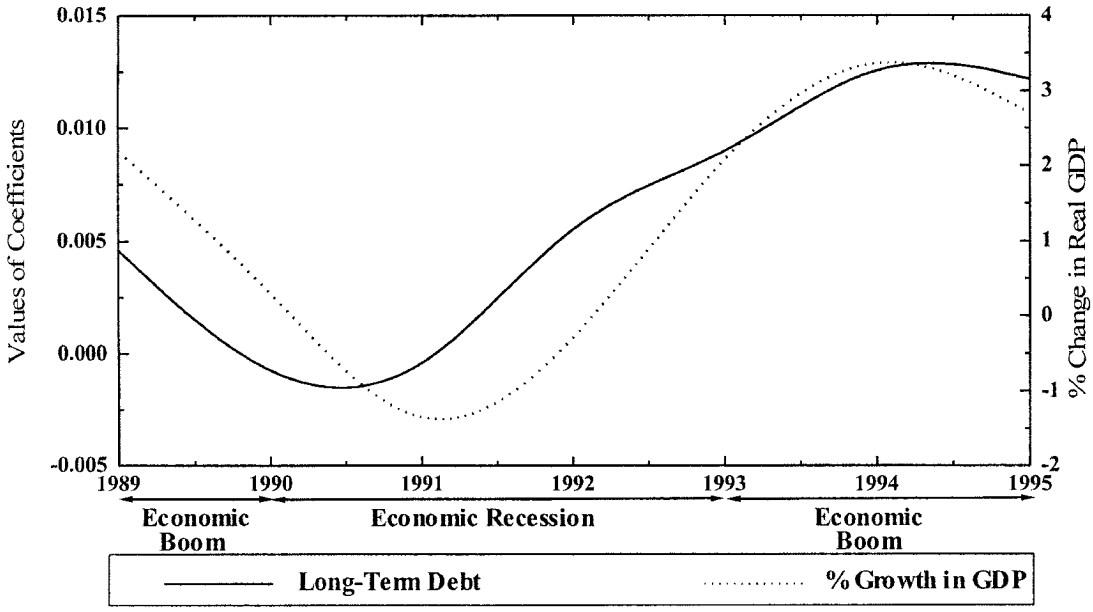

Figure 3. Coefficients of time dummy variables for long term debt.

the economy and vice versa. During periods of economic recession working capital requirements may be increasing as stock levels will be piling up and payments from customers will be delayed even further. In this case small firms will have to raise short term debt to finance possible cash-flow shortages. However, during such periods of economic slowdown, major investments that would require long term finance may be delayed or cancelled and this will push the long term debt ratio down. As the economy begins to grow again, however, retained profits will start to accumulate and probably the high levels of short term debt raised during the recession will be paid off. Under such circumstances new investments may be initiated and this may result in an increase of long term debt ratios. *We therefore accept H12*. The observed time specific effects on the gearing ratios of small firms are in line with the Bank of England (1998) findings discussed above.

6. Conclusions

This paper has utilised panel data of a large sample of U.K. small firms, and empirically examined the implications of the theory of capital structure in the small business sector, by providing evidence on the magnitude, direction and significance of the regression coefficients of the different capital structure determinants, across time and industries. The results suggest that most of the determinants of capital structure presented by the theory of finance appear indeed to be relevant for the U.K. small business sector.

The central conclusions from the empirical application of the capital structure theory to the small business sector, carried out in the study, suggest that agency and asymmetric information costs have an effect on the level of both the short and long term debt in small firms. The existence of higher agency and asymmetric information costs in the small business sector mean that smaller firms with lower ratios of collaterialisable assets, which are considered risky by financial institutions as they appear to be sensitive to temporary economic downturns have to rely on lower levels of external debt finance.

The results also indicate that tax effects do not appear to influence, at any significant level, the total debt position of small firms, although, tax considerations may become an important element in the longer term capital structure decisions in these businesses. It was very interesting to note that some of the influences encountered in the analyses are far less straight forward than the hypothesised effects suggested by the theory of

capital structure. Rather, some variables appear to influence the maturity structure of debt as well as the total debt level of small firms.

Furthermore, the paper provides evidence which suggest that the capital structure of small firms is time and industry dependent. The results indicate that time and industry specific effects influence the total level of debt as well as the maturity structure of debt raised by small firms. In general terms, average short term debt ratios in small firms appears to be increasing during periods of economic recession and decrease as the economic conditions in the marketplace improve, indicating the sensitivity of small firms to macro-economic changes. On the other hand, average long term debt ratios exhibit a positive relationship with changes in economic growth.

7. Policy and research implications

The policy implication that emanates from the results is that policy makers and financiers have to recognize that the borrowing requirements of small businesses are not stable over time or across industries. Rather, there appears to be some variation in the borrowing needs of small firms, that may be related to changes in the broader economic condition of the marketplace, or specific industry characteristics. It could, therefore, be the case that government policies targeting small businesses as well as lending policies of financiers may have to vary over time and across industries as well, to match the changing borrowing requirements of small firms.

The results in general suggest that small business owners tend to use retained profits as much as possible and then raise debt only when additional finance is essential (*Myers*' pecking order theory). This course of action will be constrained by the availability of funds which will be partly determined by the asset structure and the risk of the firm as well as broad macro economic conditions. Thus, the challenge for policy makers is to provide an environment in which owner managers are able to retain sufficient profits in their businesses to fund the largest possible number of economically viable projects (*Reid*, 1996).

Yet, the current U.K. tax regime does not provide any incentives or compensation to businesses for retaining profits, as corporation tax (or income tax in the case of unincorporated businesses) is charged on profits left in the business. There is scope for fiscal policies, probably in the form of tax allowances, that will provide incentives to retain profits and encourage investment in growth oriented strategies. Only if such an initiative is introduced will the SME sector be enabled to provide the maximum possible contribution to economic performance.

In fact, Chittenden et al. (1996b, 1998), in their investigation of the burden of taxation on small firms, suggest that at this stage of the recovery, it is more appropriate for government to pursue fiscal policies that encourage business owners to expand their firms, rather than introduce tax cuts that would accelerate consumer spending. They recommend the introduction of "a tax free allowance of £5,000 or 25% of profits left in the business each year (whichever is higher)" (Chittenden et al., 1998).

Finally, from a research perspective, the results of this study point out that any cross-sectional examination of determinants of capital structure at one point in time, will only capture a part of the whole picture. Rather, there is a need for further research that will examine the determinants of capital structure in small firms over a longer period of time, and over a number of economic cycles, if we are to better understand capital structure policies in these firms. Quantitative tests of the empirical implications of the theory of capital structure in the small business sector is an interesting and promising area, yet largely neglected by the finance literature.

Note

[1] We plot the coefficients of the dummies of the long term debt analysis on a different figure because these coefficients are much smaller than the coefficients in the total and short term debt analyses so that when plotted on the same axis makes it difficult to visualise changes.

Appendix

TABLE IV
Small firms panel database

Year	Industry										
% (1995)	All	1	2	3	4	5	6	7	8	9	10
	100	6.1	11.6	19.7	17.3	4.5	5.7	1.7	17.0	8.2	8.2
1995	3500	214	405	689	607	158	198	60	595	287	287
1994	3453	210	401	686	601	156	196	59	583	280	281
1993	3042	182	372	568	558	131	175	56	506	257	237
1992	2701	169	348	505	517	108	163	51	430	211	199
1991	2396	141	318	435	484	93	150	48	389	182	156
1990	2034	121	298	370	455	72	125	44	310	117	122
1989	1795	113	286	314	451	59	106	35	253	79	99
1988	1678	106	285	283	454	46	104	29	219	58	94
Total	20599	1445	3395	4362	5135	905	1425	437	3632	1506	1637

Where: Industry 1: agriculture, forestry and mining; Industry 2: manufacturing; Industry 3: construction, Industry 4: wholesale and retail trade; Industry 5: hotels and restaurants; Industry 6: transport and communication; Industry 7: finance, Industry 8: business services; Industry 9: education, health and social work, and; Industry 10: other.

TABLE V
Means and (standard deviations) of dependent and explanatory variables

Variables	Year								
	Total	1988	1989	1990	1991	1992	1993	1994	1995
Gearing: Total Debt	0.422 (0.28)	0.401 (0.24)	0.412 (0.27)	0.417 (0.25)	0.438 (0.29)	0.442 (0.32)	0.432 (0.29)	0.423 (0.270)	0.403 (0.25)
Gearing: Short Term Debt	0.303 (0.21)	0.306 (0.19)	0.313 (0.22)	0.314 (0.20)	0.320 (0.22)	0.310 (0.23)	0.299 (0.22)	0.292 (0.20)	0.285 (0.19)
Gearing: Long Term Debt	0.119 (0.20)	0.095 (0.15)	0.099 (0.17)	0.103 (0.16)	0.118 (0.21)	0.132 (0.22)	0.133 (0.22)	0.131 (0.21)	0.118 (0.18)
Age	23.3 (20.5)	25.3 (20.8)	25.2 (20.8)	24.1 (20.5)	23.3 (20.5)	23.0 (20.5)	22.5 (20.5)	22.1 (20.2)	21.0 (20.2)
Size	£3.44m (6.27)	£2.79m (4.68)	£3.29m (5.67)	£3.43 (5.91)	£3.33m (5.67)	£3.35m (5.79)	£3.34m (5.71)	£3.48m (6.23)	£4.04m (6.39)
Profitability	0.069 (0.14)	0.088 (0.13)	0.082 (0.15)	0.077 (0.14)	0.059 (0.17)	0.049 (0.16)	0.059 (0.14)	0.071 (0.14)	0.079 (0.13)
Growth	0.396 (1.59)	0.472 (0.79)	0.540 (0.83)	0.506 (1.09)	0.363 (1.45)	0.226 (1.20)	0.299 (1.74)	0.397 (1.91)	0.456 (2.13)
Growth opportunities	0.008 (0.04)	0.006 (0.04)	0.006 (0.03)	0.008 (0.05)	0.008 (0.04)	0.008 (0.04)	0.009 (0.05)	0.009 (0.05)	0.008 (0.04)
Risk	0.098 (0.51)	0.095 (0.62)	0.084 (0.12)	0.098 (0.56)	0.099 (0.52)	0.099 (0.49)	0.103 (0.54)	0.099 (0.51)	0.099 (0.51)
Asset structure	0.353 (0.28)	0.329 (0.24)	0.335 (0.25)	0.344 (0.26)	0.358 (0.27)	0.375 (0.29)	0.368 (0.29)	0.356 (0.29)	0.343 (0.29)
Stock levels	0.156 (0.19)	0.194 (0.19)	0.187 (0.19)	0.169 (0.19	0.155 (0.19)	0.149 (0.18)	0.144 (0.18)	0.142 (0.19)	0.147 (0.19)
Non-debt tax shields	0.044 (0.04)	0.066 (0.04)	0.041 (0.04)	0.043 (0.04)	0.044 (0.04)	0.043 (0.04)	0.041 (0.04)	0.039 (0.04)	0.038 (0.04)
Marginal tax rates	0.180 (0.12)	0.255 (0.10)	0.234 (0.11)	0.211 (0.12)	0.189 (0.12)	0.180 (0.12)	0.180 (0.12)	0.189 (0.12)	0.190 (0.12)
Net debtors	0.056 (0.19)	0.057 (0.18)	0.057 (0.18)	0.061 (0.19)	0.060 (0.19)	0.053 (0.18)	0.053 (0.19)	0.055 (0.19)	0.055 (0.19)

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