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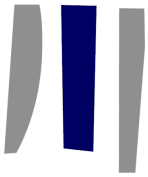

European Investment Bank

Economic and Financial Report 2001/02

Do capital expenditures determine debt issues?

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Notes

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Abstract

While it is commonly believed that companies issue non-current debt in order to finance capital expenditures, the relationship among these two variables is in practice much more complicated, and it depends on the overall real and financial flows related to companies' activity. Looking at such flows reveals that internal sources are higher than capital expenditures for listed companies in France, Germany and Italy. UK companies on the contrary run a financial deficit. Yet, French companies issue more debt than UK companies do. The anomaly is explained by our econometric model, revealing that lagged leverage is the main determinant of debt issues. As French companies display the highest leverage, they also issue the most debt. Collateral is found to positively influence debt issues in all countries except France. There is also evidence that debt issuance by UK companies is positively affected by size and liquidity, and negatively affected by profitability. Size, liquidity and profitability are not found to affect issuance for continental companies, perhaps because these companies run a financing surplus.

Do capital expenditures determine debt issues?

Companies finance their investment each year out of a mix of internal and external sources, the former consisting mainly of retained earnings, the latter of debt. Investment accumulated over the life of the firm constitutes the firm's capital stock. Accumulated earnings and debt, together with shares issued over the life of the firm, determine its capital structure. While often the firm's main assets, the capital stock is by no means the only asset that needs to be financed. Cash, financial investments, other tangible as well as intangible assets are also financed by the capital structure of the firm and thus the issue of how investment is financed cannot easily be addressed. If one looks at companies' balance sheets, it is the total of the firm's assets that is financed by the total of its liabilities and shareholder's equity, that is, by its capital structure. Thus, investment in any given year is just one element (although a very important one) within a more general balance sheet optimisation problem. Taking a flow of funds perspective seems to be more promising. After all, investment is a "capital expenditure" that is ultimately financed by some cash outflow. Why not study the relationship between capital expenditures, internally generated funds, issues of new loans, etc. as reported in the cash flow statements? Unfortunately, these statements do not have unambiguous interpretation either. Capital expenditures may be financed through the sale of an existing asset, for instance. New debt can be issued to refinance expiring loans even in the absence of any investment activity. Thus, even in a cash flow statement, it is only the sum of sources that equates the sum of uses. Attempting to match individual sources to individual uses is unlikely to be appropriate.

A healthy scepticism should however not deter us from analysing flow of funds data in the search for broad regularities in investment financing. We do so in this paper by relying on company-level sources, and by focussing our attention on listed companies in the UK, Germany, France, and Italy over the last decade. Indeed we do find broad regularities. Firstly, we observe that internal funds are by themselves sufficient to finance almost all capital expenditures in the UK and even exceed capital expenditures in the other countries. Debt and share finance play only a limited role in financing capital expenditures when compared to internal funds. This evidence is puzzling especially since an analysis of balance sheet data for our sample, revealing that debt in various forms accounts for between 30% and 40%, is consistent with the commonly held view that debt is primarily issued to finance investment. In the second part of the paper, we try to address the puzzle through an econometric analysis of the relationship between borrowing and investment flows. We are able to identify a robust statistical relationship between debt issues and capital expenditures, characterised by a reasonable fit and which is unlikely to be spurious. In particular, debt issues depend on investment in a way that is consistent with the consensus in the capital structure literature.

The paper is organised as follows. The first section describes the aggregate accounts of the companies in our sample and presents the most relevant summary statistics. In the second section, after proposing an empirical specification that is broadly consistent with the main theories of capital structure, we discuss the results from estimation of the model. The third and final section concludes. Excellent survey material on capital structure can be found in Harris and Raviv (1991) and the recent "red book" of the Deutsche Bundesbank and the Banque de France edited by Sauvé and Sheuer (1999). Therefore, we do not feel compelled to discuss the existing literature in general terms. Rather, we refer to selected specific papers as the need arises in the discussion.

1. DESCRIPTION OF THE SAMPLE

We concentrate on companies that are listed on major European stock markets and that report comprehensive cash flow data. As national characteristics are thought to be an important factor in corporate finance, we find it appropriate to conduct our analysis by country. This leaves us with a dilemma, as the number of listed companies varies greatly across countries and in particular there are insufficient numbers of observations to support an econometric analysis for all European countries. Four countries satisfy the joint requirement of providing a large enough number of companies that at the same time report a long enough history of data. These are the UK, France, Germany and Italy.

Sample selection criteria

There are three main criteria for a company to be included in our sample. Firstly, we recognize that financing decisions are taken at a group level, rather than at a subsidiary level. Hence, we require accounts to be reported at a consolidated level and exclude consolidated subsidiaries from the sample to avoid double counting. Thus, for instance, Volkswagen AG is included but not Audi AG, as the latter is consolidated into the former. There is one obvious conceptual difficulty with applying this criterion for listed subsidiaries of foreign companies. One would think for instance that a UK subsidiary of a US parent company does not take autonomous financing decisions and should therefore be excluded from the sample. In practice this does not turn out to be a cause for concern as the few cases that fall into this category fail to satisfy other sample selection criteria[1]. Our second selection criterion is based on availability of relevant cash-flow information for a sufficient number of years. All companies included for the UK and France report

[1] An open question concerns the potential biases, which may result from omission of joint ventures and Special Purpose Vehicles, domestic or foreign. These entities are included in our sample only if they are consolidated into another listed company or they are listed independently. Otherwise, their omission implies a loss of information on the overall volume of the borrowing and investing activities of the companies in our sample, since these entities are typically set up to raise funds in order to finance specific capital expenditures. Whether a systematic bias in our analysis would arise is a question that deserves further research.

non-missing values for issues of debt and capital expenditures[2] over the period 1989-99. In the case of Italy and Germany the sample has been shortened to the period 1994-99 in order to obtain a sufficient number of companies. Thirdly, we trim from the sample a few companies based on the fact that they report negative net worth, and/or large outlier values for profitability and market to book[3].

Previous literature has restricted attention to companies in the mining, construction and manufacturing sectors, usually defined by their primary two-digit SIC sector code between 10 and 39 (a table of two-digit SIC sectors is reported in the Annex). For each country, we combine all companies across such sectors, and refer to this group as the "manufacturing group". Coupled with the above criteria, this yields 192 companies for the UK[4], 60 for France, 36 for Germany and 43 for Italy. We decided however to look also at companies in the transport, utilities, trade and services sectors (two-digit SIC from 40 to 59 and from 70 to 89). In the UK, there are 120 such companies satisfying our criteria[5]. We refer to this second group as the "services group". An insufficient number of non-manufacturing companies are listed in other countries. We are thus left with five groups, namely UK "manufacturing" (UKM), UK "services" (UKS), French, Italian and German "manufacturing" (FRM, ITM, GEM respectively). All data are extracted from the Worldscope Database compiled by Bureau Van Dijk.

Asset composition in the balance sheets

The composition of assets for our five groups of companies is plotted in Figure 1. For each group the initial and the final year of the sample are shown. The plots are obtained as unweighted averages to avoid biasing the results towards the largest companies in each sample. Similarities across countries/ sectors are more evident than differences. In all groups and at both ends of the sample, the majority of assets are represented by Property, Plant and Equipment (between 20% and 30%), Inventories (15-25%) and Receivables (20-30%). Over time, the most notable evolution is the increase in Intangible Other Assets that are negligible at the beginning of the period and amount to almost 10% of Total Assets by 1999. This is possibly due to the large merger activity, especially in the late 1990s.

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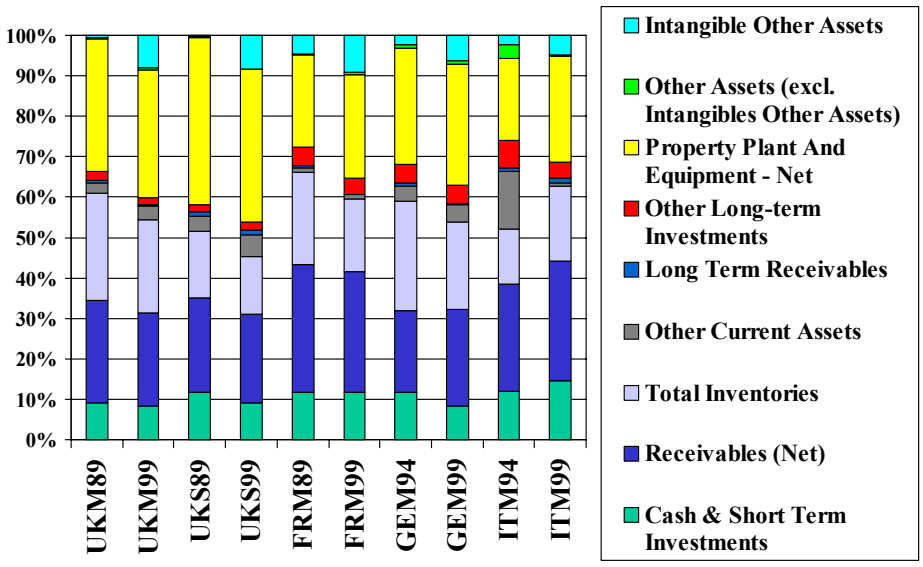
[2] Availability of other data, in particular from balance sheets, that are needed for the estimation turns out not to be restrictive for companies that report complete cash flow data. We will explain below how debt issues include all issues of bonds, loans, capitalized leasing, etc. with maturity at issue above one accounting period.

[3] Using a method presented and compared with alternative methods in Kremp (1995), firms with observations for profitability and market to book outside the interval defined by the first and third quartiles minus or plus five times the inter-quartile range were discarded.

[4] Of these, 160 are in the manufacturing sector (two-digit SIC 30-39), 30 in construction and only 2 in the mining sector. The prevalence of manufacturing is even more important in the other countries.

[5] Between 25 and 30 companies in each of the Transport, Retail Trade and Services sectors and almost 40 in the Wholesale Trade sector.

Figure 1:Composition of total assets, Unweighted average, Percent

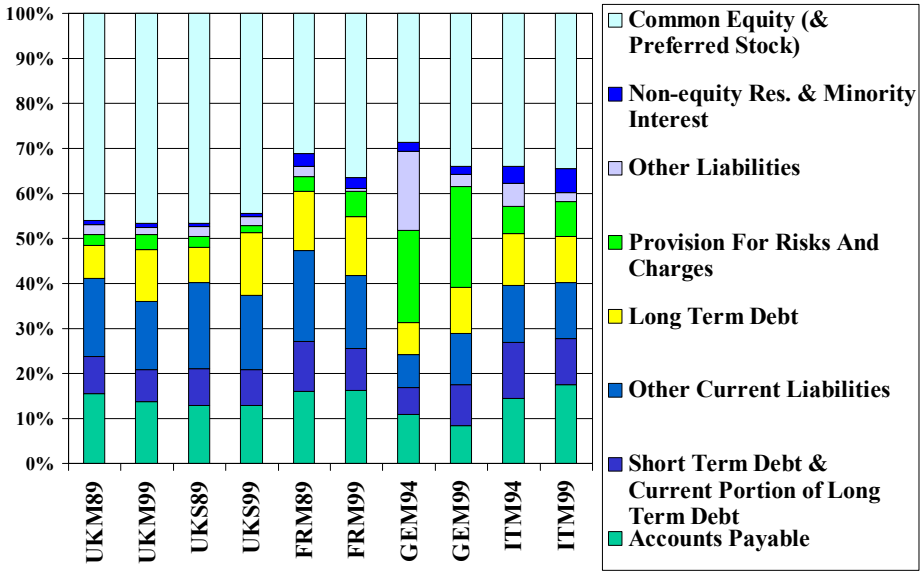


Source: Worldscope Balance Sheet Data

Liability composition: what is long-term debt?

Figure 2 presents the corresponding plot for Liabilities and Shareholder's Equity.

Figure 2. Composition of total liabilities, Unweighted average, Percent



Source: Worldscope Balance Sheet Data

Debt instruments of various kind and maturities account for 30% to 40% of the balance sheet in Figure 2. While the maturity mix is somewhat varied across countries, it can be roughly described as 10% very short-term (accounts payable), 10% short-term (short term debt and current portion of long term debt) and 10% longer term (long term debt). Unfortunately, published accounts only provide a crude split of debt along the maturity curve. Essentially, one can distinguish between debt falling due in the year (accounts payable and short term debt) and that falling due in more than one year (long-term debt.) The long-term debt data at our disposal lump together all interest bearing financial obligations excluding amounts due within one year. Included are thus mortgages, bonds, long term bank overdrafts, medium term loans, capitalized lease obligations, revolving credit, etc. Excluded are current portion of long term debt, pensions, deferred taxes and minority interest. Thus there is no way to distinguish between market and bank debt.

Naturally, beyond the broad similarities across countries, there are also differences that are driven by country specific features. Firstly, the proportion of equity is much higher for the UK, amounting to over 45% of the total balance sheet, compared to approximately 35% in continental Europe, despite the overall de-leveraging process that swiped on the continent in the 1990s (see below). Secondly, continental European companies have a much higher proportion of provisions. In Germany, provisions include a large amount of company-based supplementary old age pension schemes. These have a long tradition, especially encouraged by special tax regulations. In Italy, companies accumulate withdrawals from employees' monthly paychecks in the form of "provisions for termination indemnity", which are subject to a favourable tax treatment and are only paid when an employee leaves the firm. The amount of provisions in France is higher than in the UK, but lower than in Germany and Italy.

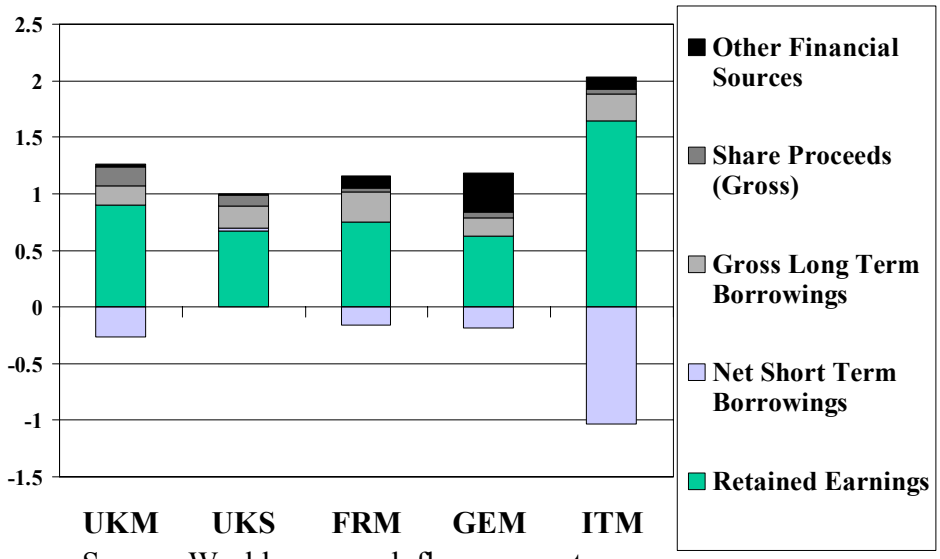
Cash flow statements: sources of funds

Evolutions of balance sheet components are best examined through plots of the cash flow accounts. According to standard practice we report separately **sources of funds from** uses. As the composition of flows is very volatile across time, we have computed unweighted averages across both companies and time periods. The results for the sources of funds are shown in Figure 3. Retained earnings are the prevalent source of funds in all groups. Apparently, companies prefer to limit dividend distribution and to fund their investment mostly through internal sources. This interpretation is reinforced by a few other observations. Firstly, all groups except UKS have reduced their short-term borrowings, in other words short-term borrowings were a use, rather than a source of funds. This explains why the sum of the other sources has to exceed one in the figure. Notably in Italy, half as much short-term debt has been repaid as other sources have been raised. Secondly, long-term borrowing has been much smaller compared to internal sources in all groups. Long-term borrowing comprises instruments whose maturity exceeds the normal reporting period of one-year and it represents the amount received from issuance of long-term debt (thus including both new loans and issues of bonds, convertible and not convertible), increase capitalised lease obligations, and debt acquired from acquisitions. Unlike short-term borrowings for which only the net change is reported, long-term borrowings are reported gross of repayments, the latter being

classified as a use of funds in the cash flow statements. Thirdly, share issues were a significant although small source of funds only in the UK, while elsewhere they were negligible. Finally, other financial sources are important only in Germany where they are the main component of provisions.

The prevalence of retained earnings, coupled with the aforementioned reductions in short-term borrowings explains why Common Equity has increased for all groups in 1999 from the beginning of the sample (see Figure 2). UKS, the only group of companies for which Common Equity has not increased, has kept its short-term borrowings constant, while as we will see below it has also repurchased more shares than it has issued.

Figure 3. Average (unweighted) composition of sources of funds 1989-99*. Fraction of total sources



Source: Worldscope cash flow accounts
*IT and GE 1994-99 only

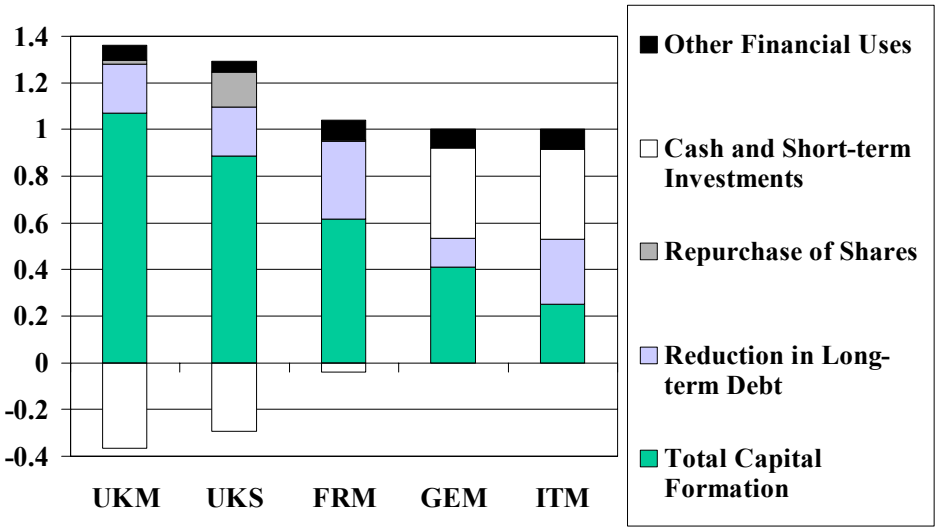
Cash flow statements: uses of funds

Figure 4 plots the main uses of funds, again averaged across companies and years with equal weight for each observation. Countries differ more in the composition of their respective uses of funds than they do in their sources. In the UK capital expenditures are by far the main use, followed by reductions in long-term debt. Cash and short-term investments were reduced in the UK over the period so that effectively they constituted a source, rather than a use of funds. As we mentioned above, Worldscope reports reductions of long-term debt separately from issues. By comparing Figures 3 and 4 (and recalling that the total of uses is equal to the total of sources) one can observe that reductions exceeded issues in the UK, so that long-term borrowings were not a net source of funds. This is reflected in the liability composition in Figure 2, where one observes the stock of long-term debt remaining unchanged throughout the sample period. The service

sector has repurchased a significant amount of shares and this is reflected in the reduction of common equity in its balance sheet.

In France, reductions in Long-term Debt represent over 30% of total uses of funds, and this implies lower levels of capital expenditures than in the UK, relative to total uses. The dynamics are well known, as French companies reduced investment and repaid debt in the (successful) effort to improve their equity base in the 1990s. Germany and especially Italy present capital expenditures in percentages of total uses that are even lower than in France. Over 50% of funds in both countries are used to accumulate cash and short-term investments and to repay long-term debt.

Figure 4. Average (unweighted) composition of uses of funds 1989-99*. Fraction of total sources



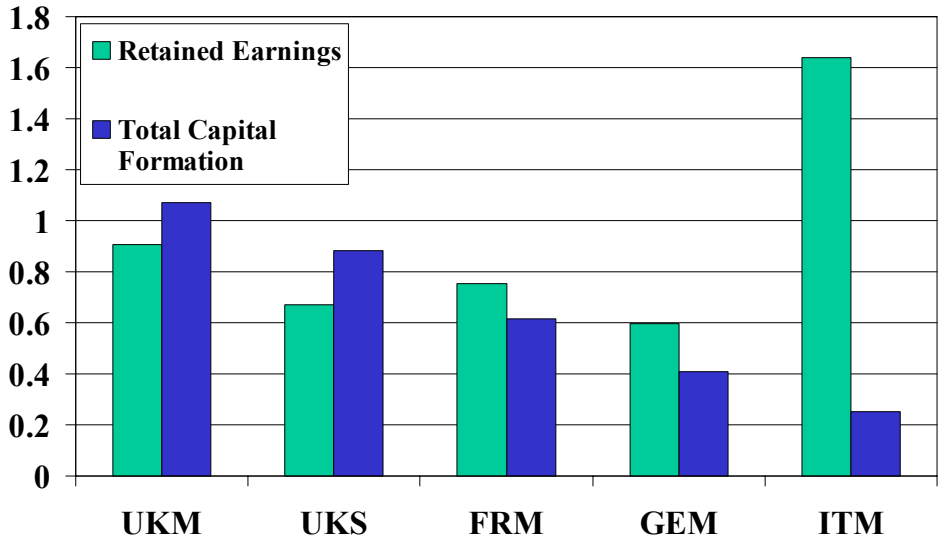
Source: Worldscope cash flow accounts
*IT and GE 1994-99 only

Financing gap versus financing surplus

An examination of the relative amounts of capital expenditures and retained earnings provides a key interpretation of capital structure dynamics over the period. The comparison is drawn directly in Figure 5. In the UK, companies across sector groups invested in excess of their retained earnings. Since this "financing gap" was partially covered through a reduction in cash and short-term investments, the equity base of UK companies remained relatively constant. A small decrease in equity for the service group was mostly due to repurchases of shares, as we have seen above. The situation in continental Europe was the reverse. German and especially Italian companies invested less than their retained earnings and used the proceeds to reduce their leverage, both long- and short-term debt. In contrast to UK companies that shed their cash holdings in order to finance investment, German and Italian companies accumulated cash at the

expense of investment. French companies also ran a financing surplus, although smaller than Germany and Italy. As we have seen, they used it to reduce both short and long-term debt.

Figure 5. Fraction of total sources, unweighted average 1989-99*



Source: Worldscope cash flow accounts
*IT and GE 1994-99 only

Commenting on the factors that explain different investment dynamics is beyond the scope of our paper. A more general discussion of investment in the 1990s can be found in European Commission (2001). Similarly, we do not dwell on explaining differences in retained earnings across groups. Our principal objective is rather to understand the determinants of debt issues for given capital expenditures and retained earnings. This is the main focus of the next section. However, it is important to keep in mind that capital expenditure needs are not likely to be the main determinants of debt issues, as the qualitative evidence in this section suggests.

2. DETERMINANTS OF DEBT ISSUES

It appears from the descriptive analysis in section 1 that companies issue debt only when internal resources are not sufficient to cover their financing needs. This observation is consistent with two very different theories of capital structure. According to the "trade-off theory" companies try to attain an optimal level of leverage, which in turn depends on their profitability, stability of cash flows, assets usable as collateral, taxes, etc. Observed financing decisions reflect a tendency towards an unobservable optimal leverage level. If this level is constant actual leverage will be close to its optimal level and companies will only issue small amount of debt to refinance expiring loans or bonds. Otherwise, suppose that such an optimal level is not constant over time. As long as adjustment costs are small

enough, the observed actual leverage should be close to the optimal level in any given period and therefore companies are not likely to issue or retire important amounts of debt. Our discussion in Section 1, showing that the amount of long-term debt has not changed too much over the last decade, could then be taken as evidence supporting a "trade-off theory". Quite differently, the "pecking order" theory of capital structure states that firms always prefer to finance their assets out of internal sources as asymmetric information creates a conflict of interest between insiders (managers, holders of existing loans, bonds or shares) and outsiders (investors, banks, etc.) No optimal level of leverage exists according to this second theory. Our discussion in Section 1, showing that companies rely mostly on internal funds, could support the "pecking order" theory too. This ambiguity is now widely recognized in the literature. While a large number of studies has developed and applied empirical methodologies to tests the implications of both theories, the consensus is that tests of either hypothesis in general lack power against the alternative. Shyam-Sunder and Myers (1999) and Chirinko and Singha (1999) provide a state of the art discussion of the issue. Rather than entering the debate, we choose to take an eclectic approach and include elements from both theories in our model of debt issues.

Determinants of debt issues

Several determinants of leverage have been investigated in the empirical literature. Harris and Raviv (1991) present a comprehensive survey of the results: "… studies generally agree that leverage increases with fixed assets, non-debt tax shields, growth opportunities, and firm size and decreases with volatility, advertising expenditures, research and development expenditures, bankruptcy probability, profitability and uniqueness of the product". The survey in Harris and Raviv (1991) has been the starting point for most recent studies. Rajan and Zingales (1995) and more recently the papers in Sauvé and Scheuer (1999) provide a thorough discussion of recent developments. Among these, a most notable development has been the estimation of dynamic leverage functions, which include lagged leverage as a regressor. Kremp and Stöss (2001) estimate dynamic leverage models for France and Germany while Ozkam (2001) studies UK companies. Drawing on this literature, we select five main determinants of debt issues.

Firstly, gross debt issues should depend positively on the lagged level of leverage (*Lev*). Both the "trade-off" and the "pecking order" theory are consistent with a positive relationship. If the former theory applies, we can assume that companies with observed high levels of leverage also have high unobservable leverage targets. They will issue new debt in order to remain close to their target as existing debt expires. If the latter theory applies, companies may display high levels of debt as a result of consistently weak cash inflows. Such companies will show both high levels of leverage and high issuance activity. We choose to measure *Lev* as the ratio between long-term debt and long-term debt plus equity, to be consistent with the fact that our debt issue variable includes only non-current debt instruments.

Secondly, debt issuance may depend on the size of the company (*Size*), however the sign of such an effect is uncertain a priori. On the one hand, it is widely believed that smaller

companies are faced with tighter borrowing constraints due to asymmetric information. The argument is discussed by a wide literature, and in particular by Fazzari, Hubbard and Petersen (1988) and Gilchrist and Himmelberg (1994). Also, larger companies typically have better access to debt markets. Both arguments would imply a positive sign. On the other hand, at least in principle, if a small and a large company face the same investment opportunity, the latter is more likely to have sufficient internal sources to cover the full expenditure while the smaller company will have to resort to credit (pecking order theory). In this case, one should observe a negative sign. We find it simplest to measure *Size* as the natural logarithm of the number of employees.

Thirdly, the availability of fixed assets to be used as collateral should be positively related to debt issuance, as it reduces the risk for the lender. This is particularly true if the lender is subject to both ordinary business risk and moral hazard/ adverse selection (the latter due to asymmetric information). Following standard practice (see Kremp and Stöss 2001) we include the ratio of fixed assets plus inventories divided by total assets among our explanatory variables (*Colta*).

Fourthly, firm profitability (*EBTA*) may influence issues of debt in two different directions. High profitability may signal high marginal product of capital, in which case companies are likely to have a high demand for investment. This in turn generates high demand for credit, which is gladly met by lenders and bond investors seeing low risks in lending to a profitable firm. Conversely, highly profitable firms will be able to generate internally most of needed funds and will not need to issue debt. If the pecking order theory applies these companies will not distribute their profits as dividends, but rather use them to finance their capital expenditures[6]. Concerning the measure to use, EBITDA is generally thought to be the best widely available proxy for cash flow as it takes into account all funds that are generated internally by the company. We follow standard practice of normalizing by total assets to obtain a measure of profitability (henceforth *EBTA*). It would be preferable to split EBITDA into its three components Earnings (before amortization and depreciation), interest and taxes so that one could use the three separately as explanatory variables in the econometric model. This would allow testing the separate effects of such components. However, insufficient availability of data on interest and tax payments prevents us from exploiting this approach.

The fifth and final explanatory variable is the "current ratio", that is, the ratio between current assets and current liabilities (*Curr*). One reason why this variable may be important is that it is a proxy for liquidity. According to Ozkan (2001), firms with higher liquidity can support a relatively higher leverage as lenders have greater reassurance that obligations will be met when they fall due. This will imply a positive relation between issues of debt and the current ratio. Another reason for a positive sign, relevant in our set-

[6] Note the difference between the argument given above to include lagged leverage under the pecking order theory (i.e. *sustained low* profitability implies both high leverage and high issue) and the argument given here (i.e. *uncharacteristically low* profitability in a given period forces the firm to issue an *uncharacteristically* higher amount of debt). Separate identification of these two effects would require specifying a fully dynamic model of the company balance sheet, which is beyond the scope of this paper.

up is that sustained high issues of non-current debt allow for reduction in current liabilities and thus increase the current ratio for a given level of current assets. However, if a company generates cash flows in excess of expenditures, one may observe an increase in the volume of liquid assets in the absence of debt issues, possibly giving rise to a negative statistical relationship[7].

A final word about potentially omitted variables as listed in the above quote from Harris and Raviv (1991). The magnitude of non-debt tax shields, other than depreciation is not available, too few firms report R&D expenditures and in any case these are not reported separately from advertising expenditures. Finally, there are too few observations to compute a meaningful measure of earning volatility[8].

The econometric model

The following general model, whose variables have already been introduced above, is estimated for each group of companies separately:

$$\left(\frac{LTB}{Capex+NAA}\right)_{it} = f\left(Lev_{i,t-1}; Size_{i,t-1}; Colta_{i,t-1}; EBTA_{i,t-1}; Curr_{i,t-1}; \alpha_t; \alpha_i; t\right)$$

where $\alpha_t; \alpha_i; t$ indicate that we have also tested versions including respectively time effects, fixed effects and time trends.

Three main observations are in order concerning the dependent variable and the lagged structure of the model. Firstly, as already mentioned, the *LTB* variable represents the gross amount received by the company from issuance of long-term debt (convertible and not convertible), increase capitalized lease obligations, and debt acquired from acquisitions. The choice of gross rather than net issues is important. A corporation's choice of issuing long-term debt is a discrete one as companies either apply for a mortgage or not, they either issue a bond or they do not. A net measure of debt issued does not contain any information about financing choices, as "pre-determined" repayments of outstanding long-term debt are subtracted from new issues. Gross measures are thus preferable. Secondly, *LTB* is normalized by the sum of capital expenditures and net assets from acquisitions (*NAA*) because we need some scaling measure to control for heteroskedasticity. Thirdly, our normalization enables a loose interpretation of the estimation results as a test of the null hypothesis that no relationship

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[7] We will see below that this is indeed the case in a Tobit model.

[8] To deal with the problem, Kremp and Stöss (2001) construct a clever cross-sectional risk measure as the squared relative difference between the firm-specific profit and the average profit of all available firms. Since their study includes a large number of small non-listed companies, which are much more likely to default than their listed counterparts, risk turns out to be important. We do not believe that this would be the case for our sample.

exists between issues of debt and capital expenditures. Under such null hypothesis, no pre-determined variable should help predicting the ratio under study. By entering all regressors as lagged variables such hypothesis can be tested[9].

Summary statistics

A closer examination of the summary statistics (Table 1 below) informs our choice for the estimation method. Perhaps not surprisingly, still quite strikingly, the median company-year in all groups except FRM hardly issues any debt (the latter exception appears to be by explained by a higher median leverage in France, consistently with our model above.) We take the fact that such a significant proportion of observations for the dependent variable is equal to zero as an indication that debt issuance follow a censored model and accordingly, we fit a Tobit model to the company-year data. One possible objection to a censored modelling approach is however that companies may like to issue infrequently in higher quantities in order to save on fixed issuance costs (and to provide better liquidity in the case of bond issues). In order to control for this possibility, we also fit a cross-sectional regression for average issuance (always normalized by capital expenditures plus net assets from acquisitions) over the observation period. Comparing the results from the two different estimation strategies is important also due to purely econometric reasons. On the one hand, the computational difficulties associated with introducing company specific effects in the Tobit regressions prevents from controlling for heterogeneity bias in the Tobit slopes. On the other end, cross-sectional regressions are more subject to endogeneity bias as the regressors and the dependent variable may be jointly determined[10]. In practice, when both methods give consistent estimates we are more confident that the coefficient sign and magnitudes are reliable and we have a stronger base for interpretation.

Concerning the other dependent variables, we first notice that median values of *Colta* do not differ substantively across groups. *EBTA* is also very similar with a slightly smaller value only for ITM, indicating a lower profitability of Italian listed companies over the period. Median *Curr* is of the order of 1.5 everywhere except for GEM where current assets are twice as large as current liabilities. This is not surprising, given the large amount of provisions in German balance sheets.

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[9] In addition to that, entering the regressors in lags should limit biases arising from endogeneity of omitted variables. To be fully rigorous, a full vector autoregressive structure should be specified and the endogeneity of each variable should be explicitly tested, but this would be beyond the limited scope of our study. We have however checked the robustness of our results by also running models including contemporaneous regressors instead of lagged ones: no major qualitative difference in the estimated coefficients was found.

[10] We fit the cross-sectional regression to unweighted company means of the data used in the Tobit regression. While this may aggravate endogeneity problems, it ensures that the two models are estimated over the same period.

Table 1. Median values for the balanced panel over the period 1989-99*

	UKM	UKS	FRM	GEM	ITM
Number of companies	192	120	60	36	43
Debt issues/ Capex	0.00	0.00	0.38	0.03	0.02
Leverage	0.12	0.15	0.26	0.18	0.18
Number of Employees	1,368	1,282	3,800	6,048	3,462
Collateral/ TA	0.59	0.58	0.47	0.54	0.47
EBITDA/ TA	0.15	0.14	0.13	0.14	0.11
Current Ratio	1.5	1.3	1.5	2.2	1.6

*One observation for each company-year. Germany and Italy, 1994-99 only

More specific attention should be paid to *Size*. Whereas other studies, notably the papers in Sauvé and Scheuer (1999) have split their sample in different size classes and estimated a separate model for each class, we include *Size* as a regressor, due to a relatively limited number of observations in our sample. Before presenting the results we should however discuss a few differences in the size distribution of companies across groups as well as possible correlations between *Size* and other dependent variables. Table 1 shows that UK companies have by far a smaller median number of employees than any other group. This is consistent with the fact that listing is a wider practice in the UK than it has traditionally been in continental Europe and therefore small and large companies alike are to be found in the UK sample. To the opposite extreme is our German sample whose median number of employees is more than four times as large as in the UK. The largest company in the GEM group, Siemens AG with almost 450,000 employees, is also the largest overall. It is quite bigger than the largest UK companies (Unilever Plc. with over 300,000 and British Telecom Plc. with 250,000) as well as the largest French (Alcatel over 200,000) and Italian companies (Finmeccanica S.p.A. less than 70,000) in the respective samples. Table 2 below presents the simple (contemporaneous) correlation between *Size* and the other variables. There is no clear correlation pattern with the dependent variable, or with profitability and collateral. Instead, high correlations are observed with *Lev* and *Curr*, indicating that larger companies display higher leverage and lower current ratios. In other words, larger companies tend to make a larger use of long-term debt than smaller companies do, ceteris paribus. This suggests that, if one were to split the sample by size classes, she should expect only the estimated coefficients for *Lev* and *Curr* to differ across sub-samples.

Table 2
Simple correlation coefficients with the log-employees variable 89-99*

	UKM	UKS	FRM	GEM	ITM
Debt issues/ Capex	0%	11%	5%	-10%	5%
Leverage	38%	33%	26%	7%	38%
Collateral/ TA	-14%	22%	4%	-4%	13%
EBITDA/ TA	2%	11%	-22%	-10%	3%
Current Ratio	-31%	-35%	-51%	-21%	-42%

*One observation for each company-year. Germany and Italy, 1994-99 only

Econometric results

The summary results from our regressions are shown in Table 3 below, where ITM and GEM are pooled after the appropriate tests for poolability were unable to reject the null hypothesis. We report only the results for the pooled group, labelled as ITGEM in Table 3. Some similarities between Italian and German companies could have been spotted already in the descriptive analysis of the sources and uses of funds in section 1. Both countries have the lowest levels of investment as a fraction of total uses and run a financial surplus, which allows companies to accumulate cash and to repay short-term debt[11]. The full results for several specifications as well as the standard errors of the coefficients are reported in detailed tables in the appendix.

As expected, there is a strong positive influence of leverage on debt issues. Coefficients are of a reasonable order of magnitude, and with values consistent across both Tobit and "between" (i.e. cross-sectional) regressions in each group. Based on the latter regressions we find that our model has a reasonable fit, with R-squares ranging from 32% for UKS to 16% for FRM. The between regressions also suggest that variation in *Lev* may well explain half of the variation in the dependent variable. As a matter of fact, if *Lev* is dropped, the R-squares for all groups diminish by approximately half. In the case of FRM, which as we have seen is both the group with the highest issuance and the highest leverage, the R-square drops from 16% to zero. Another confirmation of the good quality of our regressions comes from the fact that the constant in the Tobit model is negative for

[11] While also running a financial surplus, French companies invest more as a percentage of total sources and de-cumulate cash.

all groups in which median issuance is close to zero, that is UKM, UKS and ITGEM. The same constant term is positive for FRM. This is consistent with the censoring set-up, characterized by the fact that only positive values of the underlying variable are observed while negative ones are censored to zero. For an illustration of the Tobit framework see for example Greene (1992).

Colta also displays a consistently positive and significant sign, again with the notable exception of France. We are not surprised by this exception for two reasons. Firstly, we know that *Lev* accounts for almost the totality of the explained variation in debt issues for FRM. Thus whatever is left for other regressors to explain is negligible. Secondly, a negative sign for *Colta* is also found by Kremp and Stöss (2001). They mention the fact that under French bankruptcy laws, the collateral can be seized by private lenders only after all company's financial obligations towards the French State and its labour force have been satisfied. This is not the case in the other countries.

Table 3. Debt issues/ Capex on lagged regressors

	TOBIT regressions*				**Between regressions**			
	UKM	**UKS**	**FRM**	**ITGEM**	**UKM**	**UKS**	**FRM**	**ITGEM+**
Constant	-5.121***	-2.015***	1.388*	-2.186**	-0.748*	-0.304	1.811*	-0.281
Leverage	4.329***	1.396***	2.242***	1.424*	3.026***	1.087***	2.290***	1.669**
Log Employees	0.229***	0.136***	-0.038	0.068	-0.027	0.032**	-0.066	-0.050
Collateral/ TA	2.001***	0.891***	-1.481**	3.201***	1.187***	0.288*	-1.539	2.184***
EBITDA/ TA	0.982	-0.913	0.352	1.799	-2.192**	-0.981**	-0.605	-0.906
Current Ratio	0.162	-0.082	-0.329**	-0.220*	0.306***	0.116**	-0.151	0.062
Adjusted R-sqr					22%	32%	16%	16%
Adjusted R-sqr if Leverage is omitted					11%	20%	0%	9%

*Time dummies always insignificant +Chow test insignificant for all coefficients

The high significance for lagged *Lev* and *Colta* is a common feature that is found in most empirical capital structure studies. Here we document that the same variables consistently explain not only capital structure, but also issues of debt. The performance of the other explanatory variables is more mixed across countries. Size is only significant for the UK and has positive sign. This could be explained by the fact that in the UK bond markets are more developed but are tapped mostly by larger companies, due to high fixed costs of issuance. In continental Europe, all companies use bank credit, which has much lower fixed costs and therefore can be used economically by small and large companies alike. Unfortunately, our data do not enable us to distinguish among the different sources of company credit and therefore we cannot further investigate this hypothesis.

Interpretation of the coefficients for the *EBTA* and *Curr* variables is more difficult, as the estimates display different patterns not only across countries but also across econometric models. The UK is the only country for which *EBTA* is significant, with a negative sign as predicted by the "pecking order" theory in the between regressions. This indicates that the most profitable companies are the ones who borrow the least. Recall from our descriptive analysis in section 1 that UK companies run a "financing deficit" as opposed to companies in continental Europe that run a "financing surplus". Clearly, high cash flows are not likely to strongly influence issuing decisions for a company already running a financial surplus. In contrast, higher profitability will have a direct effect on demand for debt from a company that, as is commonly the case in the UK, is running a deficit. One difficulty with this argument is that *EBTA* is not significant in the UK Tobit regressions. In the case of UKS, the magnitude and sign of the coefficient are very similar (-0.913 for the Tobit and –0.981 for the between) and therefore one could argue that the Tobit coefficient is estimated imprecisely but it is not biased. Not so for the UKM group where the Tobit coefficient is positive, although not significant (0.982 versus –2.192 in the between regression). We do not have a ready explanation and we plan to explore the possible role of heterogeneity bias on the results in further work.

The *Curr* variable is positive and significant in the between regression for the UK suggesting perhaps that liquidity has a positive effect on the issuing activity of cash strapped companies. Tobit estimates are not significant, however the differences are less striking than in the case of *EBTA*. In contrast, the *Curr* variable is negative and significant for FRM and ITGEM in the Tobit regressions, while insignificant in the between regressions. The negative and significant sign in the Tobit regressions is not surprising for ITGEM as we have seen that companies in Italy and Germany have reduced their current liabilities while at the same time accumulating cash and short term investments. This implied an increase over time of their current ratios. In the presence of a low debt issuing activity, such an increase is consistent with a negative sign in the Tobit regressions. Since the effect works across time and not necessarily across companies, it is also not surprising that the coefficient in the between regressions is not significant. The negative sign for French companies is more puzzling as they did not increase their cash holdings and only slightly reduced their short-term liabilities. However, we already know that the impact of regressors other than leverage is negligible in France.

Are the results circular?

Let us conclude this section by addressing one legitimate concern that may arise from the above results. Does finding that lagged leverage is the main determinant of debt issues imply that our main result is simply to explain leverage by itself? We believe such circularity should not be a problem, provided leverage can be predicted on the basis of pre-determined variables other than past issues of debt. The regressions in Table 4 show that this is indeed possible. When company fixed effects are included, the fit is indeed extremely high. Of course, this line of reasoning has problems of its own, as fixed effects cannot be easily interpreted. Also, several authors have been able to obtain a very good fit by estimating dynamic models. They document that lagged leverage is positively and significantly correlated with leverage. The coefficients in Table 4 may be biased by such

an omission. Nevertheless all regressions in Table 4 show that leverage is indeed explained by pre-determined variables and therefore our evidence that issues depend on leverage cannot be considered a tautology.

Table 4. Leverage on lagged regressors
OLS with fixed effects

	UKM	UKS	FRM	ITGE+
Mkt/ Book	0.020***	0.004	0.021*	-0.081***
Log Employees	0.026***	0.053***	0.034***	0.080***
Collateral/ TA	0.087***	0.096**	-0.012	-0.134
EBITDA/ TA	-0.143***	-0.009	-0.712***	-0.517***
Time dummies	1990-97*** 1998*	1990-96***	1990-92*** 1997**	1995*** 1998***
Adjusted R-sqr	5%	11%	16%	19%
Memo: adj. R-sqr with fixed effect	59%	68%	84%	83%
Memo: adj. R-sqr between	31%	26%	11%	16%

+Chow test insignificant for all coefficients, including country dummy

For an in depth discussion of the signs and magnitudes of the above coefficients and for a comparison with other countries and time periods, see Rajan and Zingales (1994) and Harris and Raviv (1991).

3. SUMMARY AND CONCLUSIONS

Objective of this study is to analyse the determinants of debt issues with a special consideration given to their relationship with capital expenditures. Data availability limits the selection to listed companies in the UK, France, Germany and Italy over the last decade. While finding broad similarities in the balance sheets of companies in different countries and sectors, we also notice a fundamental difference in the cash flow statements between UK and continental companies. Over the last decade, the latter have consistently generated a financial surplus, by keeping their capital expenditures below the level of retained earnings. Such a surplus has partially been used to retire debt, the rest being accumulated as cash and short-term investments. The opposite is the case in the UK, where companies depleted their stock of cash in order to finance capital expenditures in excess of their earnings. This being the case, it is not surprising that a strong negative relationship is found between debt issues and profitability in UK, while no significant relationship can be found for France, Italy and Germany.

Our econometric analysis reveals that the most important determinant of debt issues is lagged leverage. This is consistent with the results from dynamic models of leverage and it applies to all countries. The availability of collateral, measured as the percentage of fixed assets and inventories over total assets, has a positive and significant influence on debt issues in all countries except for France. In the case of this country, all of the model variation appears to be explained by lagged leverage. Firm size has a significant influence on debt issues only in the UK, with a positive sign. This is not surprising as UK listed companies are more numerous and heterogeneous than elsewhere. Finally, while the effect of liquidity on debt issues in the France, Italy and Germany is undetermined, as one would expect for companies that run a structural financial surplus, there is some evidence that more liquid companies issue more debt in the UK, possibly because lenders expect a timely servicing of the debt.

We conclude that our model of debt issues may be considered a satisfactory first step. However, the evidence is mixed concerning the relationship with capital expenditures. On the one hand, the ratio between debt issues and capital expenditures is predictable on the basis of pre-determined variables, showing that it does not vary randomly. Such pre-determined variables enter the model with signs that are broadly consistent with consensus in the capital structure literature. Also, measures of fit for the cross-sectional regressions are quite high, ranging from an adjusted R-sqr of 15% in the case of France, to over 30% for UK companies in the "services group". On the other hand, descriptive statistics show that debt issues occur only infrequently, in less than half of the company/ year observations, while capital expenditures are non-zero almost for all company/ years. Moreover, debt issues are more frequent for French, Italian and German companies, which are running a financial surplus, than they are in the UK, whose companies run a financial deficit. Tackling the question clearly requires a more sophisticated model than the one presented in this paper. Firstly, the possibility of equity issues has to be considered. Secondly, the model should enable controlling for periods of reduced investment, in which companies tend to run financial surpluses, in other words, capital expenditures should be explicitly modelled. Thirdly, profitability should also be treated as endogenous. A model that is more sophisticated along such lines should also help us to better understand the different levels of significance, sign and magnitudes that some of the explanatory variables display across countries and sectors.

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ANNEX

1. Standard Industrial classification groupings:

- **Division A. - Agriculture, forestry, & fishing (01-09)**
- **Division B. - Mining (10-14)**
- **Division C. - Construction (15-17)**
- **Division D. - Manufacturing (20-39)**
- **Division E. - Transportation & pub. utilities (40-49)**
- **Division F. - Wholesale trade (50-51)**
- **Division G. - Retail trade (52-59)**
- **Division H. - Finance, insurance, & real estate (60-67)**
- **Division I. - Services (70-89)**
- **Division J. - Public administration (91-97)**
- **Division K. – Non-classifiable establishments (99)**

2. Detailed summary statistics and estimation results

See tables below

UK: Summary Statistics (1989-1999)

Manufacturing Sector (192 firms)

	mean (standard error of mean)	median	min	max
Debt issues/ Capex	0.42 (0.120)	0	0	32.79
Leverage	0.16 (0.011)	0.12	0	0.95
Market to Book	1.42 (0.039)	1.31	0.43	4.68
Number of Employees	8514 (1932)	1368	28	308000
Collateral/ TA	0.59 (0.011)	0.59	0.08	0.98
EBTIDA/ TA	0.14 (0.006)	0.15	-0.5	0.51
Current Ratio	1.75 (0.059)	1.53	0.27	9.07

UK: Manufacturing Sector (192 firms)

Annual Means

	Debt issues/ Capex	Leverage	Market to Book	Number of Employees	Collateral/ TA	EBITDA/ TA	Current Ratio
1999	0.57	0.20	1.33	7835	0.56	0.12	1.73
1998	0.61	0.19	1.27	7929	0.57	0.13	1.73
1997	0.53	0.17	1.55	8045	0.58	0.15	1.76
1996	0.33	0.16	1.58	8417	0.58	0.14	1.78
1995	0.47	0.15	1.55	8016	0.59	0.13	1.75
1994	0.35	0.14	1.50	7965	0.58	0.14	1.75
1993	0.41	0.14	1.57	8368	0.59	0.13	1.80
1992	0.55	0.14	1.34	8709	0.60	0.12	1.80
1991	0.39	0.14	1.29	9177	0.60	0.13	1.78
1990	0.19	0.15	1.21	9496	0.61	0.16	1.74
1989	0.25	0.14	1.39	9695	0.60	0.17	1.68

Correlation Matrix

	Debt issues/ Capex	Leverage	Market to Book	Log of Employees	Collateral/ TA	EBITDA/ TA	Current Ratio
Debt issues/ Capex	1.00	0.20	-0.06	0.00	0.10	-0.08	0.11
Leverage	0.20	1.00	0.06	0.38	-0.09	-0.14	-0.23
Market to Book	-0.06	0.06	1.00	0.11	-0.30	0.48	-0.07
Log of employees	0.00	0.19	0.09	1.00	-0.08	0.02	-0.13
Collateral/ TA	0.10	-0.09	-0.30	-0.14	1.00	-0.08	0.16
EBTIDA/ TA	-0.08	-0.14	0.48	0.02	-0.08	1.00	0.01
Current Ratio	0.11	-0.23	-0.07	-0.31	0.16	0.01	1.00

UK: Manufacturing Sector (192 firms) 1990-1999

	LTB/ (Cap.Ex.+N.A.Acq.)						LTD/ T.C.		
	Tobit			Between			OLS	Within	Between
Constant	-5.076***	-5.121***	-4.847***	-0.875*	-0.748*	-0.605	-0.044*		-0.083
	(0.655)	(0.620)	(0.626)	(0.489)	(0.437)	(0.465)	(0.024)		(0.063)
Leverage	4.347***	4.329***		2.951***	3.026***				
	(0.584)	(0.578)		(0.601)	(0.586)				
Mkt/ Book	-0.040			0.128			0.034***	0.020***	0.053**
	(0.190)			(0.219)			(0.007)	(0.007)	(0.026)
Log Employees	0.229***	0.229***	0.352***	-0.027	-0.027	0.057	0.032***	0.026***	0.034***
	(0.049)	(0.049)	(0.047)	(0.038)	(0.038)	(0.036)	(0.001)	(0.007)	(0.004)
Collateral/ TA	1.971***	2.001***	1.870***	1.284***	1.187***	1.087**	-0.003	0.087***	-0.014
	(0.528)	(0.510)	(0.514)	(0.447)	(0.415)	(0.442)	(0.021)	(0.032)	(0.060)
EBITDA/ TA	1.123	0.982	-0.212	-2.858*	-2.192**	-3.156***	-0.309***	-0.143***	-0.586***
	(1.191)	(0.987)	(0.988)	(1.526)	(1.014)	(1.063)	(0.045)	(0.038)	(0.175)
Current Ratio	0.162	0.162	0.078	0.301***	0.306***	0.237**			
	(0.101)	(0.101)	(0.102)	(0.087)	(0.086)	(0.091)			
1998	0.207	0.198	0.156				-0.015	-0.015	
	(0.339)	(0.336)	(0.339)				(0.014)	(0.010)	
1997	-0.040	-0.052	-0.151				-0.035**	-0.033***	
	(0.344)	(0.340)	(0.344)				(0.014)	(0.010)	
1996	0.048	0.036	-0.120				-0.043***	-0.041***	
	(0.340)	(0.336)	(0.340)				(0.014)	(0.010)	
1995	0.269	0.260	0.053				-0.046***	-0.045***	
	(0.339)	(0.336)	(0.339)				(0.014)	(0.010)	
1994	-0.213	-0.225	-0.444				-0.069***	-0.066***	
	(0.348)	(0.344)	(0.347)				(0.014)	(0.010)	
1993	-0.069	-0.074	-0.250				-0.058***	-0.059***	
	(0.341)	(0.341)	(0.344)				(0.014)	(0.010)	
1992	0.101	0.099	-0.098				-0.051***	-0.054***	
	(0.340)	(0.340)	(0.343)				(0.014)	(0.010)	
1991	-0.432	-0.426	-0.539				-0.043***	-0.052***	
	(0.347)	(0.347)	(0.351)				(0.014)	(0.010)	
1990	-0.574*	-0.573	-0.716**				-0.033**	-0.041***	
	(0.348)	(0.348)	(0.352)				(0.014)	(0.010)	
R-sqr (adjusted)				22%	22%	11%	17%	5%	31%
F-value				9.8	11.7	7.1	31.6	9.2	22.4
df				(6,185)	(5,186)	(4,187)	(13,1906)	(13,1715)	(4,187)

Notes:
(1) R-sqr (Within & Fixed Effects) = 59%; F-test Fixed Effects (pvalue<0.0001)

UK: Manufacturing Sector (192 firms) 1995-1999

	LTB/ (Cap.Ex.+N.A.Acq.)						LTD/ T.C.		
	Tobit			Between			OLS	Within	Between
Constant	-6.531***	-6.506***	-6.217***	-1.207	-1.120	-0.997	-0.079**		-0.123
	(0.933)	(0.877)	(0.889)	(0.783)	(0.685)	(0.710)	(0.035)		(0.082)
Leverage	4.664***	4.674***		3.219***	3.267***				
	(0.827)	(0.815)		(0.862)	(0.835)				
Mkt/ Book	0.019			0.064			0.040***	-0.011	0.044*
	(0.245)			(0.277)			(0.010)	(0.010)	(0.026)
Log Employees	0.318***	0.318***	0.461***	-0.011	-0.012	0.089	0.035***	0.017	0.039***
	(0.074)	(0.074)	(0.072)	(0.064)	(0.063)	(0.060)	(0.002)	(0.013)	(0.005)
Collateral/ TA	2.769***	2.752***	2.666***	1.380**	1.317**	1.230*	-0.012	-0.065	-0.023
	(0.761)	(0.727)	(0.735)	(0.688)	(0.631)	(0.654)	(0.032)	(0.050)	(0.073)
EBITDA/ TA	1.051	1.115	-0.156	-2.688	-2.366*	-3.223**	-0.286***	-0.034	-0.354**
	(1.534)	(1.306)	(1.310)	(1.978)	(1.407)	(1.442)	(0.061)	(0.044)	(0.170)
Current Ratio	0.229	0.229	0.073	0.424***	0.423***	0.313**			
	(0.153)	(0.153)	(0.154)	(0.138)	(0.138)	(0.140)			
1998	0.197	0.201	0.160				-0.017	-0.007	
	(0.354)	(0.349)	(0.355)				(0.015)	(0.009)	
1997	-0.059	-0.053	-0.155				-0.037**	-0.023**	
	(0.361)	(0.354)	(0.360)				(0.015)	(0.009)	
1996	0.047	0.053	-0.113				-0.044***	-0.030***	
	(0.358)	(0.350)	(0.355)				(0.015)	(0.009)	
1995	0.280	0.284	0.066				-0.047***	-0.038***	
	(0.355)	(0.351)	(0.355)				(0.015)	(0.009)	
R-sqr (adjusted)				12%	13%	6%	17%	3%	22%
F-value				5.5	6.6	4.1	25.3	5.1	14.7
df				(6,185)	(5,186)	(4,187)	(8,951)	(8,760)	(4,187)

Notes:

(1) R-sqr (Within & Fixed Effects) = 74%; F-test Fixed Effects (pvalue<0.001)

UK: Summary Statistics

Services Sector (120 firms)

	mean (standard error of mean)	median	min	max
Debt issues/ Capex	0.31 (0.078)	0	0	13.33
Leverage	0.18 (0.016)	0.15	0	0.96
Mkt/ Book	1.53 (0.072)	1.3	0.39	6.77
Number of Employees	8496 (1928)	1282	8	245665
Collateral/ TA	0.57 (0.019)	0.58	0.04	0.98
EBITDA/ TA	0.15 (0.009)	0.14	-0.54	0.49
Current Ratio	1.48 (0.078)	1.28	0.02	7.93

UK: Services Sector (120 firms)

Annual Means

	Debt issues / Capex	Leverage	Mkt/ Book	Number of Employees	Collateral/ TA	EBTITDA/ TA	Current Ratio
1999	0.32	0.23	1.57	9799	0.53	0.13	1.45
1998	0.30	0.21	1.44	9392	0.57	0.15	1.38
1997	0.32	0.21	1.67	8886	0.57	0.16	1.33
1996	0.31	0.19	1.70	8584	0.58	0.16	1.45
1995	0.42	0.18	1.54	8054	0.57	0.14	1.50
1994	0.40	0.17	1.50	7800	0.57	0.14	1.53
1993	0.36	0.16	1.64	7792	0.57	0.14	1.58
1992	0.20	0.16	1.46	7815	0.58	0.14	1.55
1991	0.32	0.16	1.42	8208	0.59	0.15	1.51
1990	0.20	0.15	1.30	8680	0.60	0.18	1.48
1989	0.30	0.14	1.54	8442	0.58	0.18	1.52

Correlation Matrix

	Debt issues/ Capex	Leverage	Mkt/ Book	Log of Employees	Collateral/ TA	EBTITDA/ TA	Current Ratio
Debt issues/ Capex	1.00	0.29	-0.09	0.11	0.12	-0.13	0.00
Leverage	0.29	1.00	-0.16	0.33	0.25	-0.17	-0.33
Mkt/ Book	-0.09	-0.16	1.00	0.07	-0.39	0.54	0.03
Log of Employees	0.08	0.21	0.07	1.00	0.13	0.08	-0.16
Collateral/ TA	0.12	0.25	-0.39	0.22	1.00	-0.19	-0.33
EBTITDA/ TA	-0.13	-0.17	0.54	0.11	-0.19	1.00	-0.04
Current Ratio	0.00	-0.33	0.03	-0.35	-0.33	-0.04	1.00

UK: Services Sector (120 firms) 1990-1999

	LTB/ (Cap.Ex.+N.A.Acq.)						LTD/ T.C.		
	Tobit			Between			OLS	Within	Between
Constant	-1.873***	-2.015***	-1.881***	-0.347*	-0.304	-0.133	0.015		-0.012
	(0.372)	(0.354)	(0.354)	(0.203)	(0.190)	(0.203)	(0.027)		(0.063)
Leverage	1.358***	1.396***		1.102***	1.087***				
	(0.318)	(0.316)		(0.232)	(0.230)				
Mkt/ Book	-0.111			0.041			-0.019**	0.004	-0.023
	(0.093)			(0.067)			(0.007)	(0.007)	(0.027)
Log Employees	0.141***	0.136***	0.168***	0.031*	0.032**	0.053***	0.027***	0.053***	0.033***
	(0.029)	(0.028)	(0.028)	(0.016)	(0.016)	(0.017)	(0.002)	(0.007)	(0.006)
Collateral/ TA	0.778***	0.891***	1.009***	0.327*	0.288*	0.341**	0.111***	0.096**	0.071
	(0.281)	(0.266)	(0.266)	(0.166)	(0.153)	(0.166)	(0.024)	(0.037)	(0.068)
EBITDA/ TA	-0.484	-0.913	-1.369**	-1.206**	-0.981**	-1.468***	-0.169***	-0.009	-0.410*
	(0.665)	(0.559)	(0.551)	(0.542)	(0.395)	(0.416)	(0.060)	(0.051)	(0.224)
Current Ratio	-0.086	-0.082	-0.133*	0.117**	0.116**	0.054			
	(0.070)	(0.070)	(0.070)	(0.044)	(0.044)	(0.046)			
1998	-0.005	-0.022	-0.023				-0.016	-0.021*	
	(0.214)	(0.214)	(0.215)				(0.020)	(0.012)	
1997	0.078	0.057	0.040				-0.017	-0.021	
	(0.214)	(0.214)	(0.214)				(0.020)	(0.012)	
1996	0.002	-0.006	-0.041				-0.042**	-0.037***	
	(0.215)	(0.216)	(0.216)				(0.020)	(0.012)	
1995	0.052	0.046	0.015				-0.046**	-0.039***	
	(0.217)	(0.218)	(0.218)				(0.020)	(0.012)	
1994	0.178	0.157	0.093				-0.049**	-0.042***	
	(0.216)	(0.216)	(0.216)				(0.020)	(0.013)	
1993	0.132	0.126	0.062				-0.072***	-0.059***	
	(0.215)	(0.216)	(0.216)				(0.020)	(0.013)	
1992	-0.283	-0.274	-0.333				-0.066***	-0.055***	
	(0.223)	(0.223)	(0.223)				(0.020)	(0.013)	
1991	0.062	0.091	0.021				-0.068***	-0.057***	
	(0.218)	(0.217)	(0.218)				(0.020)	(0.013)	
1990	-0.066	-0.058	-0.138				-0.064***	-0.057***	
	(0.219)	(0.219)	(0.220)				(0.020)	(0.013)	
R-sqr (adjusted)				32%	32%	20%	17%	11%	26%
F-value				10.3	12.3	8.3	19.9	11.9	11.3
df				(6,113)	(5,114)	(4,115)	(13,1186)	(13,1067)	(4,115)

(1) R-sqr (Within & Fixed Effects) = 68%; F-test Fixed Effects (pvalue<0.0001)

UK: Services Sector (120 firms) 1995-1999

	LTB/ (Cap.Ex.+N.A.Acq.)						LTD/ T.C.		
	Tobit			Between			OLS	Within	Between
Constant	-1.353***	-1.406***	-1.335***	-0.135	-0.089	-0.004	-0.035		-0.049
	(0.471)	(0.449)	(0.449)	(0.234)	(0.222)	(0.228)	(0.038)		(0.078)
Leverage	1.163***	1.180***		0.662***	0.651***				
	(0.378)	(0.376)		(0.223)	(0.222)				
Mkt/ Book	-0.040			0.040			-0.013	0.000	-0.017
	(0.110)			(0.061)			(0.011)	(0.011)	(0.029)
Log Employees	0.125***	0.122***	0.154***	0.042**	0.045**	0.061***	0.033***	0.018	0.038***
	(0.039)	(0.038)	(0.037)	(0.020)	(0.019)	(0.019)	(0.003)	(0.015)	(0.007)
Collateral/ TA	0.499	0.546*	0.652**	0.202	0.155	0.198	0.118***	0.025	0.077
	(0.355)	(0.331)	(0.330)	(0.182)	(0.167)	(0.171)	(0.036)	(0.053)	(0.084)
EBITDA/ TA	-0.617	-0.751	-1.116*	-1.384***	-1.183***	-1.515***	-0.196**	0.127*	-0.378
	(0.767)	(0.672)	(0.662)	(0.520)	(0.418)	(0.415)	(0.083)	(0.065)	(0.240)
Current Ratio	-0.246**	-0.244**	-0.290***	0.032	0.031	-0.007			
	(0.098)	(0.098)	(0.098)	(0.052)	(0.052)	(0.052)			
1998	-0.023	-0.029	-0.029				-0.017	-0.022*	
	(0.196)	(0.195)	(0.196)				(0.021)	(0.012)	
1997	0.079	0.071	0.057				-0.018	-0.024*	
	(0.196)	(0.195)	(0.196)				(0.021)	(0.012)	
1996	0.022	0.019	-0.008				-0.042*	-0.041***	
	(0.198)	(0.197)	(0.198)				(0.021)	(0.012)	
1995	0.083	0.081	0.057				-0.045**	-0.047***	
	(0.199)	(0.199)	(0.200)				(0.021)	(0.012)	
R-sqr (adjusted)				23%	24%	19%	17%	4%	21%
F-value				7	8.4	7.8	15.9	4	8.9
df				(6,113)	(5,114)	(4,115)	(8,591)	(8,472)	(4,115)

Notes:

(1) R-sqr (Within & Fixed Effects) = 75%; F-test Fixed Effects (pvalue<0.001)

France: Summary Statistics 1989-1999

Manufacturing Sector (60 firms)

	mean (standard error of mean)	median	min	max
Debt issues/ Capex	0.81 (0.189)	0.38	0	16.93
Leverage	0.27 (0.023)	0.26	0	0.79
Mkt to Book	1.27 (0.062)	1.13	0.66	4.79
Number of Employees	21967 (5066)	3800	60	213100
Collateral/ TA	0.46 (0.016)	0.47	0.12	0.74
EBITDA/ TA	0.14 (0.009)	0.13	-0.14	0.43
Current Ratio	1.68 (0.082)	1.5	0.8	6.02

France 1989-1999
Manufacturing Sector

Annual Means

	Leverage 4c	Leverage 1	Mkt/ Book	Number of Employees	Collateral/ TA	EBITDA/ TA	Current Ratio
1999	0.77	0.26	1.35	24492	0.44	0.13	1.61
1998	0.64	0.26	1.26	23280	0.44	0.13	1.63
1997	0.71	0.24	1.30	22966	0.44	0.13	1.65
1996	0.82	0.24	1.29	22210	0.46	0.12	1.67
1995	0.68	0.25	1.21	21426	0.46	0.13	1.75
1994	0.94	0.27	1.28	21477	0.45	0.14	1.80
1993	1.04	0.28	1.32	21254	0.47	0.12	1.71
1992	0.80	0.28	1.15	21581	0.48	0.13	1.67
1991	0.88	0.28	1.16	21692	0.49	0.14	1.64
1990	0.80	0.29	1.19	21226	0.48	0.16	1.62
1989	0.84	0.28	1.47	20037	0.46	0.17	1.71

Correlation Matrix

	Leverage 4c	Leverage 1	Mkt/ Book	Log of Employees	Collateral/ TA	EBITDA/ TA	Current Ratio
Leverage 4c	1.00	0.28	0.03	0.05	-0.05	-0.05	-0.12
Leverage 1	0.28	1.00	-0.17	0.26	0.24	-0.29	-0.36
Mkt/ Book	0.03	-0.17	1.00	-0.08	-0.39	0.48	0.20
Log of Employees	0.02	0.17	-0.10	1.00	-0.02	-0.19	-0.34
Collateral/ TA	-0.05	0.24	-0.39	0.04	1.00	-0.11	-0.26
EBITDA/ TA	-0.05	-0.29	0.48	-0.22	-0.11	1.00	0.34
Current Ratio	-0.12	-0.36	0.20	-0.51	-0.26	0.34	1.00

France: Manufacturing Sector (60 firms) 1990-1999

	LTB/ (Cap.Ex.+N.A.Acq.)						LTD/ T.C.		
	Tobit			Between			OLS	Within	Between
Constant	1.336*	1.388*	2.045***	1.526	1.811*	2.586**	0.039		0.130
	(0.783)	(0.730)	(0.729)	(1.140)	(1.056)	(1.128)	(0.055)		(0.166)
Leverage	2.238***	2.242***		2.252***	2.290***				
	(0.466)	(0.465)		(0.673)	(0.667)				
Mkt/ Book	0.037			0.243			0.019	0.021*	0.031
	(0.201)			(0.355)			(0.018)	(0.012)	(0.068)
Log Employees	-0.038	-0.038	-0.023	-0.070	-0.066	-0.055	0.017***	0.034***	0.012
	(0.045)	(0.045)	(0.045)	(0.063)	(0.062)	(0.068)	(0.003)	(0.012)	(0.010)
Collateral/ TA	-1.429**	-1.481**	-1.018	-1.168	-1.539	-1.051	0.317***	-0.012	0.265
	(0.717)	(0.660)	(0.661)	(1.076)	(0.924)	(0.999)	(0.061)	(0.062)	(0.214)
EBITDA/ TA	0.220	0.352	-0.876	-1.620	-0.605	-1.667	-0.737***	-0.712***	-1.019*
	(1.475)	(1.292)	(1.281)	(2.577)	(2.096)	(2.267)	(0.124)	(0.080)	(0.517)
Current Ratio	-0.328**	-0.329**	-0.480***	-0.160	-0.151	-0.356			
	(0.155)	(0.155)	(0.155)	(0.243)	(0.242)	(0.256)			
1998	-0.216	-0.215	-0.268				0.000	0.000	
	(0.333)	(0.333)	(0.339)				(0.030)	(0.013)	
1997	0.012	0.015	-0.049				-0.032	-0.026**	
	(0.331)	(0.331)	(0.336)				(0.030)	(0.013)	
1996	-0.085	-0.086	-0.085				-0.026	-0.019	
	(0.335)	(0.335)	(0.340)				(0.030)	(0.013)	
1995	-0.150	-0.149	-0.098				-0.000	0.002	
	(0.333)	(0.333)	(0.338)				(0.030)	(0.013)	
1994	0.096	0.101	0.143				-0.008	0.002	
	(0.334)	(0.333)	(0.338)				(0.030)	(0.013)	
1993	0.309	0.308	0.355				0.004	0.020	
	(0.330)	(0.330)	(0.335)				(0.030)	(0.013)	
1992	0.047	0.045	0.075				0.017	0.035**	
	(0.332)	(0.331)	(0.337)				(0.030)	(0.013)	
1991	0.124	0.119	0.211				0.029	0.043***	
	(0.333)	(0.332)	(0.337)				(0.030)	(0.013)	
1990	0.089	0.092	0.209				0.051*	0.060***	
	(0.333)	(0.333)	(0.337)				(0.030)	(0.014)	
R-sqr (adjusted)				15%	16%	0%	16%	16%	11%
F-value				2.7	3.2	0.9	9.9	9.4	2.9
df				(6,53)	(5,54)	(4,55)	(13,586)	(13,527)	(4,55)

Notes:
(1) R-sqr (Within & Fixed Effects) = 84%; F-test Fixed Effects (pvalue=0.000)

France: Manufacturing Sector (60 firms) 1995-1999

	LTB/ (Cap.Ex.+N.A.Acq.)						LTD/ T.C.		
	Tobit			Between			OLS	Within	Between
Constant	1.958*	2.060**	2.334**	2.136	2.308	2.503*	0.066		0.076
	(1.088)	(1.050)	(1.040)	(1.427)	(1.382)	(1.367)	(0.071)		(0.157)
Leverage	1.100	1.109		0.890	0.913				
	(0.705)	(0.705)		(0.951)	(0.944)				
Mkt/ Book	0.120			0.297			0.015	0.033*	0.025
	(0.334)			(0.548)			(0.027)	(0.020)	(0.071)
Log Employees	-0.052	-0.048	-0.042	-0.071	-0.058	-0.052	0.014***	0.029	0.011
	(0.069)	(0.068)	(0.068)	(0.093)	(0.089)	(0.089)	(0.005)	(0.032)	(0.011)
Collateral/ TA	-1.789*	-1.904*	-1.614*	-1.402	-1.685	-1.437	0.329***	-0.094	0.363*
	(1.033)	(0.984)	(0.968)	(1.392)	(1.282)	(1.255)	(0.078)	(0.110)	(0.192)
EBITDA/ TA	2.732	3.203	2.687	0.011	1.284	1.038	-0.703***	-0.787***	-0.941*
	(2.469)	(2.094)	(2.072)	(3.871)	(3.058)	(3.046)	(0.181)	(0.131)	(0.532)
Current Ratio	-0.638***	-0.636***	-0.694***	-0.457	-0.430	-0.487			
	(0.242)	(0.242)	(0.241)	(0.343)	(0.337)	(0.332)			
1998	-0.264	-0.261	-0.288				0.000	0.000	
	(0.360)	(0.360)	(0.361)				(0.029)	(0.012)	
1997	0.009	0.018	-0.014				-0.033	-0.026**	
	(0.358)	(0.358)	(0.358)				(0.029)	(0.012)	
1996	-0.081	-0.084	-0.085				-0.027	-0.018	
	(0.362)	(0.362)	(0.363)				(0.029)	(0.013)	
1995	-0.114	-0.111	-0.088				-0.001	0.002	
	(0.359)	(0.359)	(0.360)				(0.029)	(0.013)	
R-sqr (adjusted)				0%	0%	0%	15%	12%	10%
F-value				0.7	0.8	0.7	7.3	5.9	2.5
df				(6,53)	(5,54)	(4,55)	(8,291)	(8,232)	(4,55)

Notes:

(1) R-sqr (Within & Fixed Effects) = 85%; F-test Fixed Effects (pvalue<0.0001)

Germany: Summary Statistics (1994-1999)

Manufacturing Sector

	mean (standard error of mean)	median	min	max
Debt issues/ Capex	0.45 (0.149)	0.03	0	11.75
Leverage	0.20 (0.021)	0.18	0	0.81
Mkt/ Book	0.66 (0.020)	0.69	0.3	0.97
Number of Employees	33545 (10307)	6048	278	440200
Collateral/ TA	0.53 (0.014)	0.54	0.02	0.78
EBITDA/ TA	0.14 (0.009)	0.14	-0.1	0.34
Current Ratio	2.63 (0.190)	2.2	0.78	8.54

Germany (1994-1999) Manufacturing Sector (36 firms)

Annual Means

	Debt issues/ Capex	Leverage	Mkt/ Book	Number of Employees	Collateral/ TA	EBITDA/ TA	Current Ratio
1999	0.69	0.23	0.66	35751	0.52	0.14	2.53
1998	0.74	0.18	0.66	35113	0.54	0.15	2.59
1997	0.24	0.20	0.66	33749	0.54	0.14	2.93
1996	0.36	0.21	0.67	31959	0.54	0.13	2.64
1995	0.29	0.18	0.67	32036	0.53	0.14	2.64
1994	0.37	0.19	0.67	32665	0.53	0.14	2.49

Correlation Matrix

	Debt issues/ Capex	Leverage	Mkt/ Book	Log of Employees	Collateral/ TA	EBITDA/ TA	Current Ratio
Debt issues/ Capex	1.00	0.16	-0.02	-0.10	0.14	-0.06	-0.13
Leverage	0.16	1.00	0.46	0.07	0.25	-0.09	-0.46
Mkt/ Book	-0.02	0.46	1.00	0.35	-0.08	-0.54	-0.57
Log of Employees	-0.10	0.07	0.35	1.00	-0.04	-0.10	-0.21
Collateral/ TA	0.14	0.25	-0.08	-0.04	1.00	0.09	-0.17
EBITDA/ TA	-0.06	-0.09	-0.54	-0.10	0.09	1.00	0.25
Current Ratio	-0.13	-0.46	-0.57	-0.21	-0.17	0.25	1.00

Italy: Summary Statistics (1994-1999)

Manufacturing Sector (43 firms)

	mean (standard error of mean)	median	min	max
Debt issues/ Capex	0.66 (0.225)	0.02	0	11.97
Leverage	0.21 (0.027)	0.18	0	0.97
Mkt/ Book	1.10 (0.054)	1.02	0.58	3.8
Number of Employees	8782 (1910)	3462	121	61240
Collateral/ TA	0.47 (0.020)	0.47	0.2	0.83
EBITDA/ TA	0.11 (0.010)	0.11	-0.5	0.28
Current Ratio	1.70 (0.108)	1.56	0.53	6.08

Italy Manufacturing Sector (43 firms)

Annual Means

	Debt issues/ Capex	Leverage	Mkt/ Book	Number of Employees	Collateral/ TA	EBITDA/ TA	Current Ratio
1999	0.55	0.21	1.25	30273	0.45	0.11	1.74
1998	0.73	0.20	1.22	29785	0.46	0.12	1.78
1997	0.46	0.22	1.14	28635	0.46	0.11	1.72
1996	0.63	0.22	0.99	27127	0.48	0.11	1.79
1995	1.20	0.22	0.98	27182	0.48	0.11	1.63
1994	0.43	0.22	1.04	27701	0.47	0.09	1.51

Correlation Matrix

	Debt issues/ Capex	Leverage	Mkt/ Book	Log of Employees	Collateral/ TA	EBITDA/ TA	Current Ratio
Debt issues/ Capex	1.00	0.34	-0.03	0.05	0.22	-0.04	-0.03
Leverage	0.34	1.00	0.08	0.38	0.19	-0.27	-0.28
Mkt/ Book	-0.03	0.08	1.00	0.07	-0.22	0.28	-0.10
Log of Employees	0.05	0.38	0.07	1.00	0.13	0.03	-0.42
Collateral/ TA	0.22	0.19	-0.22	0.13	1.00	-0.06	-0.32
EBITDA/ TA	-0.04	-0.27	0.28	0.03	-0.06	1.00	0.17
Current Ratio	-0.03	-0.28	-0.10	-0.42	-0.32	0.17	1.00

Germany and Italy: Manufacturing Sector (79=36+43 firms)

	LTB/ (Cap.Ex.+N.A.Acq.)						LTD/ T.C.		
	Tobit			Between			OLS	Within	Between
Constant	-1.934	-2.186**	-1.993**	-0.036	-0.281	0.067	-0.197***		-0.285**
	(1.205)	(0.967)	(0.962)	(0.956)	(0.694)	(0.706)	(0.064)		(0.123)
Leverage	1.472*	1.424*		1.745**	1.669**				
	(0.782)	(0.770)		(0.683)	(0.648)				
Mkt/ Book	-0.191			-0.181			0.126***	-0.081***	0.191***
	(0.552)			(0.483)			(0.033)	(0.027)	(0.071)
Log Employees	0.070	0.068	0.086	-0.049	-0.050	-0.037	0.019***	0.080***	0.013
	(0.076)	(0.075)	(0.075)	(0.055)	(0.054)	(0.056)	(0.004)	(0.018)	(0.009)
Collateral/ TA	3.109***	3.201***	3.437***	2.073**	2.184***	2.387***	0.334***	-0.134	0.466***
	(1.050)	(1.018)	(1.012)	(0.841)	(0.782)	(0.808)	(0.066)	(0.090)	(0.165)
EBITDA/ TA	1.854	1.799	1.557	-0.953	-0.906	-0.902	-0.341***	-0.517***	-0.452
	(1.881)	(1.873)	(1.899)	(1.717)	(1.702)	(1.767)	(0.120)	(0.085)	(0.284)
Current Ratio	-0.231*	-0.220*	-0.283**	0.051	0.062	-0.048			
	(0.129)	(0.125)	(0.121)	(0.110)	(0.106)	(0.101)			
Country dummy				-0.399	-0.345	-0.296	0.014		0.048
				(0.260)	(0.215)	(0.222)	(0.021)		(0.044)
D1	-0.019	-0.013	0.007				-0.026	-0.034***	
	(0.364)	(0.363)	(0.363)				(0.025)	(0.011)	
D2	-0.642*	-0.625*	-0.608				-0.003	-0.019	
	(0.373)	(0.370)	(0.370)				(0.025)	(0.011)	
D3	-0.236	-0.215	-0.226				0.006	-0.010	
	(0.366)	(0.361)	(0.361)				(0.025)	(0.011)	
D4	0.097	0.113	0.096				-0.014	-0.030***	
	(0.364)	(0.362)	(0.362)				(0.025)	(0.011)	
R-sqr (adjusted)				15%	16%	9%	13%	19%	16%
F-value				2.9	3.4	2.6	7.7	12.4	4.0
df				(7,71)	(6,72)	(5,73)	(9,385)	(8,308)	(5,73)

(1) R-sqr (Within & Fixed Effects) = 83%; F-test Fixed Effects (pvalue<0.0001)

Germany and Italy (79 firms)

Correlation Matrix

	Debt issues/ Capex	Leverage	Mkt/ Book	Log of employees	Collateral/ TA	EBITDA/ TA	Current Ratio
Debt issues/ Capex	1.00	0.27	0.03	-0.03	0.17	-0.07	-0.10
Leverage	0.27	1.00	0.16	0.22	0.19	-0.19	-0.36
Mkt/ Book	0.03	0.16	1.00	-0.03	-0.30	-0.11	-0.40
Log of employees	-0.03	0.22	-0.03	1.00	0.11	0.02	-0.16
Collateral/ TA	0.17	0.19	-0.30	0.11	1.00	0.06	-0.09
EBITDA/ TA	-0.07	-0.19	-0.11	0.02	0.06	1.00	0.28
Current Ratio	-0.10	-0.36	-0.40	-0.16	-0.09	0.28	1.00