The Determinants of Capital Structure

An Empirical Study of Differences between Swedish SMEs and Large Firms

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Abstract

The aim of this paper is to examine whether the determinants of capital structure affect Swedish SMEs and large firms differently. We use the theoretical framework of the static trade-off theory and the pecking order theory in order to establish our proxies for the unobserved firm characteristics. To empirically test our hypotheses we perform static panel data regressions on a decomposed leverage level, comprising the unobserved firm characteristics: effective tax rate, non-debt tax shields, risk, asset structure, size, age, growth opportunities and profitability. The results indicate that asset structure has a particularly strong influence on both SMEs' and large firms' borrowing decisions. In addition to asset structure, profitability, non-debt tax shields, risk and effective tax rate appears to be substantially more important for SMEs' borrowing behavior compared to large firms. In general our paper provides support for both the static trade-off theory and the pecking order theory.

Key words: Capital Structure, Panel Data, Pecking Order Theory, Static Trade-off Theory, SME

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I. Introduction

The celebrated paper of Modigliani and Miller (1958) originated the modern theory of capital structure choice. They concluded that under certain strict assumptions the value of a company should be independent of its capital structure since the net effect of the tax advantage of debt at the firm level and the tax disadvantage of debt at the personal level is zero. We know however that by relaxing these assumptions we can reach a theoretical framework that more closely resembles the reality of a firm. Two theoretical models have evolved which helps us explain how firms determine their capital structure, namely the static trade-off hypothesis and the pecking order theory, introduced by Myers (1984) and Myers and Majluf (1984) respectively. The body of research done to empirically test the implications of these models has almost exclusively focused on large and public firms. We know however that small and medium sized enterprises (SME) do not enjoy the same access to capital markets and have different characteristics compared to large firms. The SME literature repeatedly discusses the lack of management skills and the limited separation of business decisions from personal objectives. In addition, SMEs often face transaction costs prohibiting them from issuing long-term securities. As a consequence SMEs and large firms should face different borrowing constraints (Cassar and Holmes, 2003).

We believe that there is a gap in the literature regarding differences between the borrowing behavior of SMEs and large firms in general and for Swedish companies in particular. Therefore, the aim of this study is to empirically test the static trade-off theory and the pecking order theory on SMEs and large firms respectively to examine whether the determinants of capital structure affect the two groups differently. This paper also differs from the body of previous research by investigating differences on a decomposed leverage level, using short-term and long-term debt measures. For this purpose we use a Swedish nationwide panel data covering the time period 2003-2010 to perform static panel data regressions comprising the firm characteristics: effective tax rate, non-debt tax shields, risk, asset structure, size, age, growth opportunities and profitability.

This paper presents two key findings. First, asset structure appears to be the single most influential determinant of capital structure, both for SMEs and large firms. This finding indicates that firms match their tangible assets with long-term debt. Importantly, this effect on the total debt ratio seems to be three times larger for SMEs. Second, our results indicate that SMEs' borrowing decisions are more sensitive to changes in firm characteristics. This is surprising since our hypotheses are based on theories which have been developed for large firms. A possible explanation is that SMEs by nature are more prone to bankruptcy than large firms, thus more sensitive to a

marginal change in any of the characteristics. Another explanation is that there are other factors not captured by our model which influences large firms' borrowing decisions.

Overall our paper begins to bridge the gap of understanding the capital structure differences between SMEs and large firms. The remaining part of the paper is divided into four main sections. Initially, we present the most relevant theories of capital structure and earlier work in this area, followed by a motivation of our choice of determinants of capital structure. Secondly, we present our data set in greater detail and a precise description of our econometric model. In the third section, the results from our regressions are presented, followed by a robustness check. Finally, the paper is summarized by our conclusions and some brief suggestions for further work.

II. Theory of Capital Structure

In this section we present our hypotheses based on the two most influential capital structure theories in this field of research, namely the static trade-off theory and the pecking order theory. We have deliberately chosen to exclude other asymmetric information problems related to capital structure. For instance, the signaling theory by Ross (1977) and the model based on managerial risk aversion by Leland and Pyle (1977) are considered to be outside the scope of this paper.

Static Trade-off Hypothesis

The optimal capital structure of a firm is often described as a tradeoff between the cost and merits of debt. Costs are in this case represented by the cost of financial distress and agency costs arising between owners and creditors (Jensen and Meckling, 1976), whereas the merits can be measured by the tax shields of debt (Myers, 1984). The capital structure is optimal when the cost and advantages of debt are equal, which depending on the characteristics of the firm may differ from firm to firm. The realization of the large tax advantages of debt led Miller and Modigliani to correct their seminal work in 1963 and argued instead that firms should employ as much debt as possible to maximize the value of the firm (Modigliani and Miller, 1963). As a consequence, we define our first hypothesis as follows: *"Leverage should be positively related to the effective tax rate of the firm"* (H1).

There are however other sources of tax shields that can substitute the role of debt, such as discretionary expenses of research and development (R&D) and depreciation (DeAngelo and Masulis, 1980). Our second hypothesis is thus as follows: *"Leverage should be negatively related to the non-debt tax shields"* (H2).

An implication of leverage is that it increases a firm's likelihood to default on its debt obligations. As a consequence: *"Financial leverage should be negatively related to operating leverage"* (H3). In other words, risky firms should borrow less, ceteris paribus (Myers, 1984). Debt is

also associated with problems such as moral hazard and adverse selection, which induce lenders to require collateral on a firm's loans, often in the form of tangible assets. In addition, intangible assets for which there is no secondary market, due to asset specificity, will be associated with higher cost of liquidation (Williamson, 1988). As a result: *"Leverage should be positively related to the tangibility of the firm's asset structure"* (H4).

In the framework of the static trade-off theory the cost of debt is represented by the cost of financial distress and ultimately the probability of bankruptcy. The probability of default is partly captured by our third hypothesis regarding operating leverage, but there are also other factors influencing the likelihood of default. It is generally presumed that larger firms are less likely to default since they are more diversified and therefore should have a greater debt capacity (Titman and Wessels, 1988). As a result: *"Leverage should be positively related to firm size"* (H5).

Even though age is not frequently used as a firm characteristic in earlier work, we believe that it has explanatory power in determining the capital structure of a firm. This is underpinned by the view that young firms typically lack a track record and therefore have more difficulties in borrowing on long-term conditions. As a consequence: *"Leverage should be positively related to age"* (H6).

The Pecking Order Theory

The underlying assumption of the pecking order theory is that there exist information asymmetries between the manager of a firm and outside investors. As a result, when issuing risky new securities as a source of finance, these securities might be underpriced. If underpricing is too severe, the new investors receive more than the net present value (NPV) of the project and the project will be rejected even if it has a positive NPV. Managers hence prefer to use less risky sources of capital, i.e. to use internally generated funds before debt and debt before equity (Myers and Majluf, 1984). As a consequence: *"Leverage should be positively related to the firm's growth opportunities* (H7) *and negatively related to profitability"* (H8).

Table I
Description of Tested Hypothesis

Tested Hypothesis	Theory
(1) *"Leverage should be positively related to the effective tax rate of the firm"*	Trade-off
(2) *"Leverage should be negatively related to the non-debt tax shields"*	
(3) *"Financial leverage should be negatively related to operating leverage"*	
(4) *"Leverage should be positively related to the tangibility of the firm's asset structure"*	
(5) *"Leverage is positively related to firm size"*	
(6) *"Leverage should be negatively related to the age of the firm"*	
(7) *"Leverage should be positively related to the firm's growth opportunities"*	Pecking Order
(8) *"Leverage should be negatively related to profitability"*	

The table describes the hypotheses which we aim to test against SMEs' and large firms' capital structure. Each hypothesis describes an unobservable firm characteristic that is associated with either the static trade-off theory or the pecking order theory.

III. Determinants of Capital Structure

In the previous section we discuss the theories which aim to explain the determinants of capital structure. Since most of these effects are unobservable, we need accounting proxies to measure the influence of these theories on capital structure. In the following section we present the firm specific characteristics which we believe affect the capital structure choice of a firm. It should be noted that a change in a determinant either gives a firm incentives to borrow marginally more/less, or the lending institution to provide marginally more/less funds. Initially, we introduce prior authors' work and motivate the impact of the determinant. This is followed by a brief presentation of the chosen proxy, how it is constructed and finally, the expected relationship between the determinant and the capital structure measures. The determinants are presented in the following order: effective tax rate, non-debt tax shields, risk, asset structure, size, age, growth opportunities and profitability.

Effective Tax Rate (H1)

As mentioned earlier, the main benefit of debt according to the static trade-off theory are the tax benefits of debt (Myers, 1984). These benefits exist since interest payments on debt are tax

deductible, whereas payments to equity owners, e.g. dividend payments, are not. As a consequence, debt is less expensive than equity and the larger the effective tax rate, the greater are the tax advantages of debt. We define our proxy of interest tax shields as tax divided by earnings before taxes, i.e. the effective tax rate, and expect to find a positive relationship to all of our leverage ratios. This has also been supported empirically by several earlier works (Homaifar *et al.*, 1994; Sogorb-Mira and López-Gracia, 2003).

Non-debt Tax Shields (H2)

Miller and Modigliani (1963) early presented arguments indicating that firms have a strong incentive to increase leverage due to the resulting deductible interest tax shield. On the other hand, sizeable amounts of non-debt related corporate tax shields, such as tax credits for R&D and tax deductions for depreciation, may indicate that debt is inversely related to non-debt tax shields. DeAngelo and Masulis (1980) argue that larger non-debt tax shields imply greater probability of no taxable income, thus lowering the expected corporate tax rate and the expected pay-off from interest tax shields. Theoretically this is supported by the static trade-off theory which predicts that firms with larger non-debt tax shields have lower expected tax rates and therefore have less book leverage (Fama and French, 2002). These predictions are also empirically underpinned by for instance De Miguel and Pindado (2001) while Titman and Wessels (1988) find no statistical proof for an effect on debt ratios arising from non-debt tax shields.

As a proxy for non-debt tax shields we use the ratio of annual depreciation expense over sales. According to the argumentation above we would expect a negative relationship between the proxy and all of our leverage ratios.

Risk (H3)

The volatility in income is a measure of operating risk that has been argued by several authors to have a negative impact on firm leverage (Myers, 1984; Wald, 1999; Fama and French, 2002). Myers (1984) argues that, ceteris paribus, risky firms ought to borrow less since a higher variance rate in net income increases the probability of default. Firms with volatile earnings are given incentives not to fully utilize the tax benefits of debt since they are more likely to be exposed to agency and bankruptcy costs. On the other hand, several counter-hypotheses have been presented (e.g. Castanias and DeAngelo, 1981; Jaffe and Westerfield, 1984; Bradley *et al.*, 1984). Empirical evidence by Titman and Wessels (1988) and Cassar and Holmes (2003) fail to find a statistical relationship for neither SMEs nor large firms. In addition, Wald (1999) finds contradictive results since the impact seems to be country-dependent. More surprisingly, the limited research on SMEs rather suggests a positive relationship between risk and leverage (Jordan *et al.*, 1998; Michaelas *et al.*, 1999).

We use the variance in net income as a proxy for risk. Following prior arguments, volatile earnings translate into higher operating risk which should lower all of our leverage ratios.

Asset Structure (H4)

The type of assets owned by a firm should be an important determinant of capital structure according to most capital structure theories. Depending on the extent to which a firm's assets are tangible and generic, the liquidation value of the firm will be affected (Titman and Wessels, 1988; Harris and Raviv, 1991). A relatively larger proportion of tangible assets will increase the liquidation value of the firm since the values of the tangible assets can be assessed more easily. As a result, tangible assets are more likely to be accepted as collateral compared to intangible assets. By collateralizing debt, funds provided to the borrower are restricted to a specific project. If no such guarantee exists for a project, the creditors may require more favorable terms, potentially forcing the firm to use equity financing instead. Using tangible assets as collateral also prevents risk shifting since the firm will find it difficult to shift investments to riskier projects (Myers, 1977). Therefore, a relatively larger fraction of tangible assets should increase the willingness to supply financing by lenders and increase firm leverage (Rajan and Zingales, 1995). This conclusion seems to be the general consensus and is supported by a number of authors (Jensen and Meckling, 1976; Storey, 1994; Berger and Udell, 1998).

For large firms, the theoretical arguments in favor of a positive relationship between asset structure and firm leverage are supported by empirical evidence (e.g. Rajan and Zingales, 1995). The much less comprehensive research on SMEs suggests, while not conclusive, that there might be a similar positive relationship between asset structure and firm leverage. On a decomposed leverage level the relationship between asset structure and long-term debt still shows signs of a positive relationship while there seems to be a negative relationship to short-term debt (Van der Wijst and Thurik, 1993; Chittenden *et al*., 1996; Jordan *et al*., 1998; Michaelas *et al*., 1999).

As a proxy for asset structure, we use the ratio of tangible assets to total assets measured by book values. We expect a positive relationship between the proportion of tangible assets and long-term debt since a greater fraction of the assets can be used as collateral. This implies an inverse relationship for short-term debt since firms possessing relatively less tangible assets have to find more expensive alternatives to long-term debt.

Size (H5)

A substantial number of authors have suggested a positive relationship between firm size and leverage (Fama and French, 2002). Warner (1977) and Ang *et al*. (1982) argue that as the value of the firm increases, the ratio of direct bankruptcy costs to the firm value decreases. The impact of

these expected bankruptcy costs might be negligible for large firms' borrowing decisions, which enable them to take on more leverage (Rajan and Zingales, 1995). Smaller firms on the other hand face a different reality in procuring long-term debt. This is not mainly due to information asymmetry, but to the strong negative correlation between firm size and the probability of bankruptcy (Berryman, 1982; Hall *et al*., 2004). A possible explanation is that relatively large firms tend to be more diversified and consequently are less prone to insolvency (Titman and Wessels, 1988). However, Fama and Jensen (1983) suggest that transaction costs for large firms are reduced since they struggle with less asymmetric information problems. This should increase larger firms' preference for equity relative to debt compared to smaller firms.

Smaller firms often find it relatively more costly to disperse asymmetric information and as a consequence are offered less or significantly more expensive capital from financiers and lenders (Ferri and Jones, 1979). Another reason which discourages small firms to use outside financing is the fact that market access can be constrained directly because some securities require a minimum volume (Cassar and Holmes, 2003). This is generally supported by empirical evidence which concludes that small firms often are more or less forced to use short-term debt contracts due to constrained access to long-term financing (Osteryoung *et al*., 1992; Chittenden *et al*., 1996; Michaelas *et al*., 1999).

With the aim of controlling for possible non-linearity in the data, we use the natural logarithm of total assets measured by book value as our proxy for size. Since larger firms are more diversified and therefore less likely to end up bankrupt, we expect the sign of the size proxy to be positively related to long-term debt and negatively related to short-term debt.

Age (H6)

Age should affect capital structure both in the context of the static trade-off theory and the pecking order theory. According to the former, an older firm has a track record on which long-term lenders can base their lending decisions on. As a result young firms, which are typically SMEs and not large firms, will have to depend on short-term financing (Johnsen and McMahon, 2005). The pecking order theory lends support to this hypothesis since an older firm is more likely to have accumulated internally generated funds, thus reducing the need for external lending in the short-term (Petersen and Rajan, 1994).

Since the marginal effect of an additional year of track record should decline with age, we use the natural logarithm of age to control for the possibility of non-linearity. Based on the preceding arguments, we expect age to be positively related to long-term debt and negatively related to short-term debt.

Growth Opportunities (H7)

Growth opportunities is a possible determinant of capital structure which is surrounded by uncertainty not only regarding its effect on firm leverage, but also how it should be measured in an optimal way. As a starting point, firms with growth opportunities should have relatively higher demand for funds. In case retained earnings cannot be provided in desirable amounts to fund growth opportunities, firms have to turn to external financing. This suggests a positive relationship between growth opportunities and firm leverage (Michaelas *et al*., 1999).

In direct contrast, Myers (1977) shows that growth opportunities have a negative impact on firm leverage due to agency problems. Similarly, Titman & Wessels (1988) point out that growth opportunities, which are capital assets adding value to a firm, do not generate current income and cannot be used as collateral due to the their intangible nature. In the case of bankruptcy the value of these intangible assets will fall abruptly, suggesting higher bankruptcy cost for firms with higher growth opportunities (Myers, 1984; Williamson, 1988; and Harris and Raviv, 1991). Both Myers (1977) and Titman and Wessels (1988) are supported by Wald (1999) who finds a significant negative relationship between growth opportunities and leverage. However, according to Myers (1977) agency problems related to growth opportunities can be mitigated if firms issue short-term debt instead of long-term debt. Hence, a positive relationship between short-term debt and growth opportunities could exist.

As mentioned, there is a difference in opinion on how to choose an appropriate proxy for growth opportunities, including but not limited to capital expenditures over total assets, annual change in total assets and R&D over sales. Another common proxy for growth opportunities is the ratio of the market value of total assets over the book value of total assets (e.g. Myers, 1997; Rajan and Zingales, 1995). Since the data set for this paper contains a majority of non-listed companies, we are restricted to use book values of assets. Because of this restriction we have chosen to follow Wald (1999) and use growth in revenues as a proxy for growth opportunities. According to the earlier ventilated theories our hypothesis is that higher growth opportunities is positively related to short-term debt and negatively related to long-term debt.

Profitability (H8)

Myers and Majluf (1984) states in their pecking order theory that firms prefer internal financing over debt, and debt over equity. Since a more profitable firm has access to more internal finance it will use less external financing to fund its operations and investment opportunities, ceteris paribus.

The negative relationship between profitability and leverage has been tested empirically by several authors and remains almost unambiguously uncontested both for SMEs and large firms (Friend and Lang, 1988; Jordan *et al.*, 1998; Coleman and Cohn, 1999; Mishra and

McConaughy, 1999; Michaelas *et al.*, 1999; Fama and French, 2002). In fact, Wald (1999) finds that profitability has the single largest negative effect on a firm's debt to asset ratio.

On the other hand, there are a few conflicting theoretical predictions on the effect of profitability on firm leverage (Jensen, 1986; Williamson, 1988). Jensen (1986) presents a model where firms with high profitability, will likely be subjects of takeovers and increased leverage. As a result, profitable firms which have been acquired should have higher debt to assets ratio, implying a positive relationship between profitability and firm leverage.

A desirable measure for internally generated funds would have been the cash-flow before financing activities but unfortunately the nature of our data set restricts us to use earnings before interest, tax, depreciation and amortization (EBITDA) over sales as a proxy. According to the theory we would expect a negative relationship between profitability on both short-term and long-term leverage.

IV. Measures of Capital Structure

In order to estimate the impact of the determinants, we need to establish measures of capital structure. We chose two main dependent variables, namely short-term debt to total assets and long-term debt to total assets, both calculated using book values. The reason why we do not pay as much attention to total debt to total assets is that some researchers such as Van der Wijst and Thurik (1993) and Chittenden *et al*. (1996) have shown that influences of the explanatory variables on total debt is a net effect of opposite effects on short-term and long-term debt. As an example, asset structure should intuitively be positively related to long-term debt and negatively related to short-term debt which would have a neutralizing net effect on total debt. To consider only total debt as a measure of capital structure would then ignore the effect of a change in a determinant on a decomposed leverage level.

Table II

Previous Empirical Research

Hypothesis	Characteristic	Exp. Sign	BJK	KS	TW	C	HZB	RZ	CHH*	FG	FF	SG*	S*
H1	Tax Rate	+		-			+					+	-
H2	Non-Debt Tax Shields	-	+	-	-		+				-	-	-
H3	Volatility in Earnings	-	-	+	-	-	-						
H4	Tangibility	+			+	-		+	-	+			+
H5	Size	+		0	-	-	+	+	-	+	+	+	+
H6	Age	-							0			-	
H7	Growth Opportunities	+		-	+	-	-	-	+		-	+	+
H8	Profitability	-			-			-	-	-	-		-

The reported studies are: Bradley, Jarrell and Kim (1984) [BJK], Kim and Sorensen (1986) [KS], Titman and Wessels (1988) [TW], Chung (1993) [C], Homaifar, Zietz and Benkato (1994) [HZB], Rajan and Zingales (1994) [RJ], Chittenden, Hall and Hutchinson (1996) [CHH*], Frank and Goyal (2003) [FG], Fama and French (2002) [FF], Sogorb-Mira and López-Gracia (2003) [SG*], Sogorb-Mira (2005) [S*].

It is difficult to draw consistent conclusions from the above table since the authors use different proxies for the different determinants of capital structure and in several cases different dependant variables, e.g. total debt, long-term debt and short-term debt. The table shows however the general consensus in the investigated determinants of capital structure.

* Denotes studies made on small firms particularly

V. Data and Methodology

Data

Our data is sourced from the database Retriever which provides up to 10 years of accounting data on more than 400,000 Swedish companies. Specifically we have chosen companies that have more than 10 million SEK in sales and more than 20 employees. We are aware that this might lead to a selection bias, but we also believe that micro companies base there capital structure decisions on issues that we do not wish to investigate, such as managerial theories. We have chosen to include both active and inactive companies and allowed for startups in the estimation period which runs from 2003 to 2010. From the total sample we have excluded companies which are not parent companies since we wish to only examine independent companies. Including firms with parent companies would only create noise and potential measurement errors since we are investigating external financing. We have also excluded companies in the financial sector as well as companies showing inconsistent or extreme figures to avoid further noise and measurement errors. As an example, we exclude negative equity companies by requiring all debt-to-asset measurements to be larger than 0 and less than 1. In addition we have excluded companies whose fiscal year is not the same as the calendar year. The reason for this is that we need the data to origin from the same point in time, to be able to control for time fixed effects. Furthermore firms who lack data for more than 2 years were excluded. Before imposing these restrictions we had a raw data set of 133,456 observations balanced panel data divided over 16,682 firms. The definitive number of firms after our adjustments is 4,398 resulting in a 16,567 observations unbalanced panel data. Despite our restrictions, our panel data set is among the largest in this research area.

In corporate finance theory market values of debt and equity is preferred to measure capital structure. Unfortunately limitations in our data set forces us to use book values instead of market values since we include privately held companies. However Bowman (1980) shows that the correlation between book values and market values of debt is very large, thus resulting in only minor errors due to misspecification.

There is not a general consensus on what constitutes a small or medium sized company (Sogorb-Mira, 2005). We adopt the recommendation of the European Commission which states that a SME has (1) less than 250 employees, (2) sales of less than 40 million euros (assumed 400 million SEK), (3) assets of less than 27 million euros (assumed 270 million SEK) and (4) is independently privately held, i.e. not listed on any exchange (Recommendation 96/280/EC, 3 April, 1996). Our definition of SMEs resulted in 4,062 companies which were given the dummy variable value of 1, whereas 336 companies were given the value of 0, i.e. 92% of the companies in the dataset were classified as SMEs.

Table III
Panel Properties

Year	SME	Large	Total
2003	1,987	228	2,215
2004	1,994	258	2,252
2005	2,043	290	2,333
2006	2,093	300	2,393
2007	2,074	338	2,412
2008	1,995	351	2,346
2009	2,066	345	2,411
2010	194	11	205
Total	14,446	2,121	16,567

Table III describes the number of observations per year divided between SMEs and large firms. The dataset is incomplete for the year 2010 since most companies were yet to release their annual report at the time when we retrieved the data. We found no meaningful difference by excluding the year 2010 in our tests however.

Methodology – Static Panel OLS Regression

Early research such as that done by Buser and Hess (1983) use time series as a means of empirically investigating capital structure whereas later research mostly use cross sectional data with average coefficients over a number of years to minimize lagged adjustments (Bradley *et al.*, 1984; Kim and Sorensen, 1986; Titman and Wessels, 1988; Rajan and Zingales, 1995). It is not until recently that empirical tests of capital structure using panel data have started to appear, such as that made by Sogorb-Mira and López-Gracia (2003) as well as Frank and Goyal (2003). Panel data sets are beneficial in economic research and have several advantages over time-series data and cross-sectional data. Since panel data is a pooled time-series and cross-section, it has a large amount of data points which increases the degrees of freedom and reduces the collinearity in the independent variables (Hsiao, 1985).

Another advantage of pooling time series and cross-section data is that we can control for individual effects and time effects that may be unobservable and correlated with the explanatory variables in the model (Hausman and Taylor, 1981). In addition, by using panel data methodology in our empirical tests we can control for firm heterogeneity and reduce collinearity among the independent variables. Our panel data model is:

$$\boldsymbol{Y_{it}} = \boldsymbol{X_{it}} \times \boldsymbol{\beta} + \boldsymbol{\eta_i} + \boldsymbol{\eta_t} + \boldsymbol{\mu_{it}} \qquad [1]$$

where X_{it} is a 16,567 × 8 matrix which contains all the explanatory variables, β is the coefficients which we estimate as determinants of capital structure, η_i is the unobservable individual effects, η_t is the time specific effect and u_{it} is the error term. In the model i denotes the cross section of the data ranging from 1 to 4,398 and t denotes the time-series dimension of the data ranging from 1 to 6 (2005-2010).

Table IV
Explanatory Variable Proxies

Hypothesis	Characteristic	Proxy	Denomination
H1	Effective Tax Rate	Tax / EBT	ETR
H2	Non-Debt Tax Shields	Depreciation / Turnover	NDTS
H3	Risk	Variance in Net Income	RISK
H4	Asset Structure	Tangible Assets / Total Assets	TANGIBILITY
H5	Size	Log (Total Assets)	SIZE
H6	Age	Log (Age)	AGE
H7	Growth Opportunities	Growth in Revenues	GROWTH
H8	Profitability	EBITDA / Turnover	PROFIT

Table IV describes our proxies for the unobserved firm characteristics outlined in our hypothesis.

The unobservable individual specific effects are identically and independently distributed and do not vary over time. These effects could include managerial incentives, productivity and skill or factors which are specific to the firm, e.g. the entry barriers and competitiveness of the industry. The time-specific effects on the other hand vary over time, but are the same for each firm at any given point in time. These effects include such factors that influence firms, e.g. inflation and interest rates (Sogorb-Mira and López-Gracia, 2003).

To estimate our model we have to identify whether the individual differences, denoted η_i and η_t, are orthogonal, i.e. if the effects are random or fixed (Sogorb-Mira and López-Gracia, 2003). If the effects are fixed, the individual effect coefficients are estimated with the rest of the model parameters, which requires that the assumption of orthogonaity is dropped. Random effects on the other hand require that the individual effects are unobservable random variables which are independent of the explanatory variables (Bhargava *et al*., 1982). To determine whether the unobservable time-invariant individual effect is fixed or random, we perform a Hausman's specification test. The test shows that we reject the hypothesis that the individual effects are not correlated with the independent variables, hence we can consider the individual effects as fixed, see table XXI in the appendix. As a result, a fixed effects static panel data model can be estimated by ordinary least squares (OLS) over the within group transformation, in our case firms (Ozkan, 2001).

Table V

Correlation Matrix

	TD/ TA	LTD/ TA	STD/ TA	ETR	NDTS	RISK	TANGIB-ILITY	SIZE	AGE	GROWTH	PROFIT
TD/TA	1.000										
LTD/TA	0.476	1.000									
	(0.000)										
STD/TA	0.599	-0.419	1.000								
	(0.000)	(0.000)									
ETR	0.005	-0.003	0.008	1.000							
	(0.347)	(0.629)	(0.158)								
NDTS	0.005	0.295	-0.264	-0.003	1.000						
	(0.412)	(0.000)	(0.000)	(0.577)							
RISK	0.001	0.006	-0.004	0.000	0.011	1.000					
	(0.808)	(0.293)	(0.481)	(0.980)	(0.052)						
TANGIBILITY	0.083	0.599	-0.460	0.009	0.436	0.007	1.000				
	(0.000)	(0.000)	(0.000)	(0.128)	(0.000)	(0.192)					
SIZE	-0.202	0.194	-0.385	-0.018	0.041	0.000	0.152	1.000			
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.983)	(0.000)				
AGE	-0.198	0.047	-0.248	-0.008	0.035	0.003	0.145	0.341	1.000		
	(0.000)	(0.000)	(0.000)	(0.155)	(0.000)	(0.586)	(0.000)	(0.000)			
GROWTH	0.084	0.006	0.081	-0.003	0.004	-0.001	-0.051	-0.050	-0.166	1.000	
	(0.000)	(0.334)	(0.000)	(0.680)	(0.516)	(0.931)	(0.000)	(0.000)	(0.000)		
PROFIT	-0.153	0.158	-0.302	0.007	0.246	-0.003	0.289	0.134	0.040	0.026	1.000
	(0.000)	(0.000)	(0.000)	(0.198)	(0.000)	(0.611)	(0.000)	(0.000)	(0.000)	(0.000)	

Table V presents the pairwise correlations between all regression variables including, both dependent and independent variables. TD/TA denotes total debt divided by total assets, LTD/TA denotes long-term debt divided by total assets and STD/TA denotes short-term debt divided by total assets. These three measures are the dependent variables for all regressions in the paper. The remaining variables are our independent variables which are described in table IV. p-values associated with the pairwise correlations are in parenthesis.

The variables used to measure the effective tax rate, non-debt tax shields, risk, asset structure and age are measured contemporaneously with the dependent variables, whereas the variables for profitability and size are lagged. The reason that size is lagged is to handle the spurious correlation that could arise between size and leverage due to the relationship between past profitability and size, i.e. profitable firms tend to become larger. This results in a loss of one cross-section in the regressions, however the choice of including lags does not affect the number of observations in the regression since we still loose two cross-sections due to the volatility in income variable.

VI. Results

Descriptive Statistics

The following section describes the key characteristics of our data. For both the leverage ratios and the determinants of capital structure we present the data separately for SMEs and large firms. Table VI helps us explain some of our results later in the paper and the graphs on the consequent pages give us some understanding of the capital structure of SMEs and large firms.

Table VI
Descriptive Statistics of the Explanatory Variables

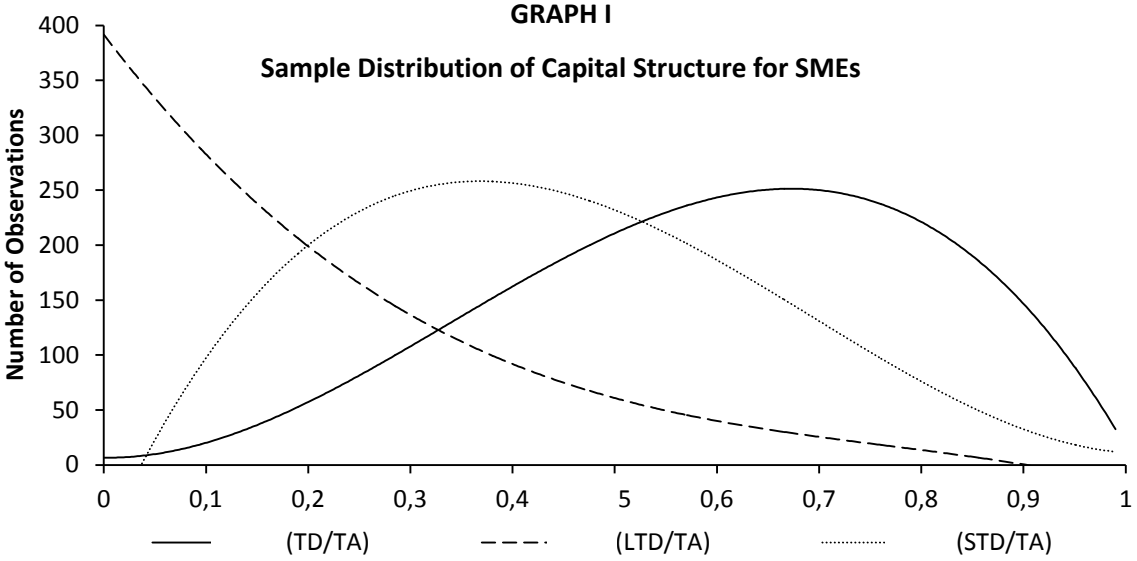
	Variable	Mean	SD	Max	Min	Median	Skewness	Kurtosis
SME	ETR	0.251	0.133	0.499	-0.989	0.288	-2.545	14.451
	NDTS	0.029	0.044	0.985	0	0.014	5.1	58.831
	RISK	0.003	0.03	0.982	0	0	17.514	366.681
	TANGIBILITY	0.318	0.243	0.999	0	0.272	0.541	2.186
	SIZE	9.963	1.026	12.504	4.852	9.954	-0.054	2.841
	AGE	2.87	0.641	4.737	0.739	2.892	0.033	2.809
	GROWTH	0.139	0.4	9.243	-0.961	0.077	7.93	117.673
	PROFIT	0.085	0.095	0.9	-1.903	0.07	-1.529	48.201
Large	ETR	0.217	0.17	0.499	-0.957	0.278	-2.465	12.446
	NDTS	0.025	0.054	0.878	0	0.008	6.731	75.027
	RISK	0.017	0.078	0.956	0	0	6.903	57.471
	TANGIBILITY	0.334	0.254	0.997	0	0.276	0.942	3.12
	SIZE	13.31	1.545	19.736	7.277	12.998	1.172	5.56
	AGE	3.237	0.693	4.728	1.119	3.136	0.021	2.531
	GROWTH	0.132	0.374	6.418	-0.923	0.079	5.658	66.67
	PROFIT	0.099	0.167	0.98	-1.6	0.08	-1.469	24.315

Table VI describes the mean, standard deviation (SD), maximum value (Max), minimum value (Min), median, skewness and kurtosis of the independent variables for SMEs and large firms respectively.

By examining table VI, we notice that the explanatory variables are overall relatively similar for SMEs and large firms. Compared to large firms, SMEs are typically younger and as expected the log of assets is 25% smaller. Noteworthy is that sales growth is only 0.7 percentage points higher for SMEs, whereas the effective tax rate is 3.4 percentage points higher for SMEs than for large firms.

GRAPH I

Sample Distribution of Capital Structure for SMEs

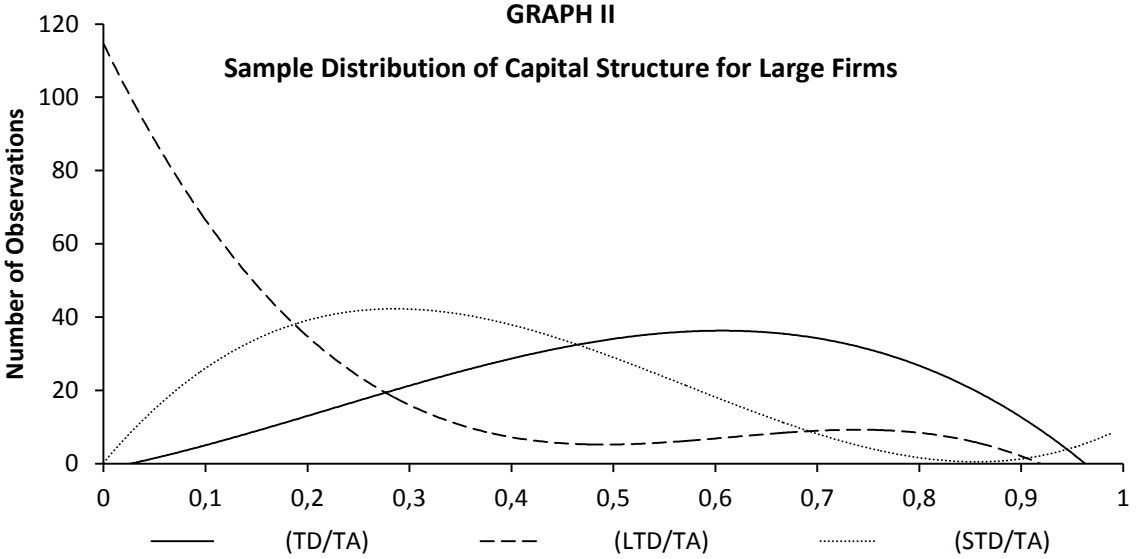


Graph I shows the sample distribution of all dependent variables (leverage ratios) for SMEs.

Examining graph I and graph II we notice that all of the leverage ratios are asymmetric and leptokurtic, i.e. they have fatter tails than a normal distribution. Only total debt is negatively skewed, i.e. the majority of the observations lie to the right of the mean. Long-term debt does not seem to follow a normal distribution for neither of the groups. However, long-term debt seems to decrease exponentially from 0.

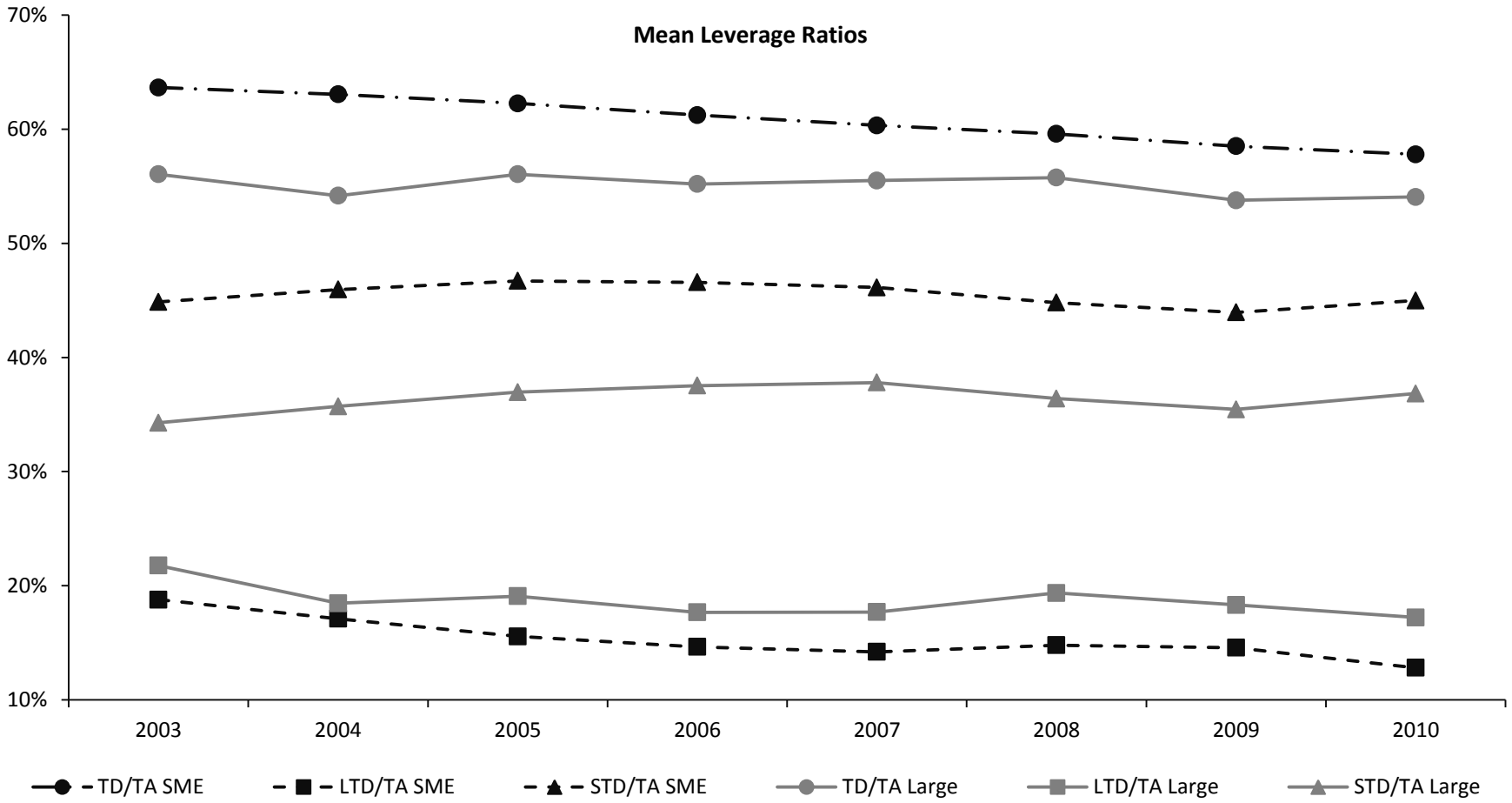
GRAPH II

Sample Distribution of Capital Structure for Large Firms



Graph II shows the sample distribution of all dependent variables (leverage ratios) for large firms.

GRAPH III



Graph III shows the development of capital structure for SMEs and large firms respectively over the time period 2003 to 2010. The graph shows the leverage ratios total debt to total assets, long-term debt to total assets and short-term debt to total assets and represents the mean of the population for each individual year.

Examining graph III, the first decade of the 21st century shows a tendency of convergence in total debt levels between Swedish SMEs and large firms. Even though the level of total debt is similar between SMEs and large firms, the capital structure is fundamentally different on a decomposed level between the two groups. SMEs typically employ significantly more short-term debt and significantly less long-term debt than large firms. There is a clear linear downward trend in total debt for SMEs, which mainly is a result of long-term debt decreasing by more than 30% since 2003.

Static Panel Data Regressions

In table VII we present the results of our fixed effects static panel data regressions. The predicted sign of the explanatory variables and the actual outcome of the regressions are shown in table VIII. Our estimates are generally in line with the hypothesized direction. A majority of the estimates are statistically significant and economically meaningful which implies that we have chosen proxies that capture the unobserved effects of what we believe are the determinants of capital structure. There is however a tendency of lower significance levels for large firms which might partly be a result of the number of observations being lower than for SMEs. On a decomposed leverage level, the R^2-values are in general relatively satisfying in comparison to previous work (e.g. Hall *et al.*, 2004). As predicted the R^2-values of total debt are significantly lower due to the neutralizing effects arising from the counteractive effects of the explanatory variables on short-term and long-term debt. The coefficient estimates of the proxies for asset structure, size and growth opportunities are all statistically significant both for SMEs and large firms for long-term and short-term debt. However growth opportunities and size do not seem to be economically meaningful for any of the firm types.

Some of our estimates seem to have a great impact on leverage. In particular, asset structure seems to have the single greatest effect on leverage both in terms of magnitude and significance. This suggests that companies try to match the maturity of their debt structure with their asset structure. Firms with a high proportion of tangible assets seem to substitute short-term debt for long-term debt and tend to have higher total debt ratios than companies without collateral. The positive effect of asset structure on long-term debt outweighs the negative effect on short-term debt, which leads to an increase in total debt. Asset structure appears to affect SMEs' and large firms' lending decisions in the same direction. On the other hand, asset structure's effect on leverage seems to be greater in magnitude for SMEs. According to table VI, SMEs typically have higher short-term debt levels than large firms. Effectively this might suggest that tangible assets are more desirable for SMEs since they, to a greater extent than large firms, are in need of substituting short-term for long-term debt. This is underpinned by the fact that the net effect on total debt is three times larger for SMEs compared to large firms.

Table VII
Regression Results

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
ETR	-0.039 **	-0.058 ***	0.013	-0.036 ***	-0.026	-0.094 ***
	(-2.63)	(-7.30)	(0.99)	(-4.36)	(-1.62)	(-10.17)
NDTS	0.083	0.149 ***	0.052	-0.183 ***	0.135	-0.034
	(1.67)	(3.36)	(0.43)	(-4.14)	(1.08)	(-0.59)
RISK	-0.030 **	-0.036	0.008	-0.038 **	-0.022 ***	-0.074 **
	(-3.10)	(-1.90)	(0.96)	(-2.67)	(-3.29)	(-2.76)
TANGIBILITY	0.205 ***	0.398 ***	-0.152 ***	-0.234 ***	0.053	0.164 ***
	(5.53)	(26.40)	(-4.10)	(-16.66)	(1.25)	(10.50)
SIZE	0.039 ***	0.020 ***	-0.019	-0.011 *	0.020 *	0.009
	(4.08)	(4.71)	(-1.83)	(-2.14)	(1.83)	(1.81)
AGE	-0.029	-0.020 *	0.075 *	-0.029 **	0.046	-0.049 ***
	(-0.94)	(-2.11)	(2.22)	(-2.59)	(1.26)	(-4.32)
GROWTH	0.018 **	0.010 ***	0.022 **	0.005	0.040 ***	0.015 ***
	(3.13)	(3.76)	(2.60)	(1.67)	(4.06)	(4.05)
PROFIT	-0.023	-0.080 ***	-0.022	-0.114 ***	-0.045 *	-0.194 ***
	(-1.43)	(-5.40)	(-1.17)	(-6.71)	(-1.96)	(-8.49)
R2 (within)	0.099	0.225	0.065	0.109	0.057	0.119
R2 (overall)	0.323	0.382	0.076	0.315	0.001	0.068
F-statistic	5.78	75.09	4.11	46.73	4.07	56.66
Observations	1869	12406	1869	12406	1869	12406
Year Dummies	YES	YES	YES	YES	YES	YES

Table VII present the results from the fixed effects static panel data regressions. Our panel data model is: $Y_{it}=X_{it}\times\beta+\eta_i+\eta_t+\mu_{it}$ where X_{it} is a 16,567 × 8 matrix which contains all the explanatory variables, β is the coefficients which we estimate as determinants of capital structure, η_i is the unobservable individual effects, η_t is the time specific effect and uit is the error term. In the model i denotes the cross section of the data ranging from 1 to 4,398 and t denotes the time-series dimension of the data ranging from 1 to 6 (2005-2010). t-values are given in parenthesis below the coefficients. *** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Examining the estimates of non-debt tax shields we notice that the coefficients, apart from the insignificant short-term debt coefficient for large firms, have the same sign as for the coefficients of asset structure. The positive signs are in contradiction to the theory since we would expect the coefficients to be negative for both leverage ratios. Even though the result is statistically significant one should be cautious in drawing inference since non-debt tax shields is highly correlated with asset structure, see table V. Rather than indicating a positive non-debt tax shield effect on leverage, we believe that this implication could actually be an indirect effect of asset structure on leverage.

According to our hypothesis we would have expected a positive relationship between the effective tax rate and all leverage ratios since the tax shield becomes larger as the effective tax rate increases. The regression results are inconsistent with this view and have negative coefficients for all statistically significant results. Although not statistically significant or economically meaningful, the only positive estimate is between large firms and short-term debt. Our results do not only indicate limited incentives to increase leverage because of taxes, but show that higher taxes should decrease leverage. One reason might be that a higher effective tax rate lowers the profitability of the firm, thus reducing the firm's lending capacity.

Table VIII
Expected Sign According to Theory and Actual Regression Results

		LTD		STD	
Hypothesis	Characteristic	Exp. Sign	Reg. Result	Exp. Sign	Reg. Result
H1	Tax Rate	+	-	+	-
H2	Non-Debt Tax Shields	-	+	-	-
H3	Volatility in Earnings	-	-	-	-
H4	Tangibility	+	+	-	-
H5	Size	+	+	-	-
H6	Age	+	-	-	+/-
H7	Growth Opportunities	-	+	+	+
H8	Profitability	-	-	-	-

Table VIII compares the expected sign of the coefficients according to our hypotheses and the outcome of our regression results. Not all signs are statistically significant.

Our results show evidence of a significant relationship between size and leverage in accordance with our hypothesis. Size seems to be positively related to long-term debt and total debt, while it seems to be negatively related to short-term debt. These estimates could confirm that larger firms are less prone to bankruptcy due to diversification and as a consequence can borrow more on the long-term. Even though our data for instance indicate that large firms employ more long-term debt than SMEs, there may still be differences in leverage decisions within these two groups due to size. In other words, small enterprises may have different characteristics compared to

medium enterprises affecting leverage decisions. The effect of size on the leverage ratios seems to be greater for large firms. We believe that an explanation could be that there exist several size thresholds for issuing certain securities within the large firm group which do not exist in the small group to the same extent. For example, SMEs can not issue bonds due to their relatively small size. On the contrary, the economic meaningfulness of our results can be discussed since the magnitude of the coefficients are fairly low.

Age is highly correlated with size (0.341), but show opposite effects on both long-term and short-term leverage. While not significant for large firms, the effect on long-term leverage is negative for both large firms and SMEs. This contradicts our hypothesis based on the static trade-off theory, but could instead be explained by the pecking order theory. Older firms have had more time to accumulate internally generated funds and thus are in less need of external financing. The age coefficient is statistically significant for both large firms and SMEs on short-term leverage, but seems to have the opposite impact for the two groups. The negative impact on short-term debt for SMEs is in line with our hypothesis. Examining table VI, we see that young firms are typically SMEs suggesting that as young firms become older they use less short-term debt, which coincides with the pecking order theory. A reasonable explanation could be that young firms lack the track record to borrow long-term debt and thus are limited to short-term financing. The opposite positive effect for large firms can not be explained as intuitively since we would expect that the older a firm becomes the less short-term debt is needed according to both the static trade-off theory and the pecking order theory. A possible explanation can be found in large firms' capital structure. According to the descriptive statistics older firms have relatively more long-term debt, but we also know that older firms typically accumulate internally generated funds. Over time the need for renewing maturing long-term debt would thus be reduced. The fact that long-term loans that mature within a year become short-term loans in the balance sheet could be a reason why the short-term debt to total asset ratio becomes larger as the firm grows older.

The estimate of risk, which uses the proxy of the volatility in earnings, shows an unequivocal negative relationship to all leverage ratios for all coefficients which are statistically significant. This is in line with our hypothesis and the static trade-off theory. The effect on leverage seems to be greater for SMEs which might suggest that large firms are less sensitive to variation in income when choosing capital structure. The reason why stable earnings is more important to SMEs might be that they have relatively fewer tangible assets and less internally generated funds which can absorb economic shocks.

After (1) asset structure and (2) non-debt tax shields, profitability is the factor which seems to influence SMEs borrowing behavior the most. In accordance with the pecking order theory

our results indicate that profitable firms borrow less both on a short-term and a long-term basis. The coefficient estimates are consistently negative across all leverage ratios independent of group belonging. On a decomposed level, the negative effect seems to be the greatest for short-term debt. This result is not surprising since higher profitability allow firms to reduce their debt financing in general and the more expensive short-term financing in particular. Inference can not be drawn on a decomposed leverage level for large firms since the coefficients are insignificant. However, the negative significant impact on total debt suggests that large profitable firms prefer to substitute debt with internally generated funds for investments. In contrast to SMEs, the economic impact on total debt is not nearly as distinctive for large firms.

Partly in contradiction to our double hypothesis, the coefficient for growth opportunities is positive and statistically significant across all debt measures and both groups. As expected, growth opportunities is positively related to short-term debt. This is likely to originate from two main causes, namely that (1) short-term debt mitigates agency problems and that (2) internal funds are often not enough to finance investment opportunities. The unexpected positive relationship between sales growth and long-term debt might be that firms try to match long-term investment opportunities with long-term debt. On the other hand, one should be cautious in drawing inference from these results since the economical meaningfulness can be discussed.

VII. Robustness and Discussion

The theoretical attributes affecting capital structure are unobservable by nature and must thus be estimated by the use of proxies. Titman (1988) identifies the most severe problem with the use of proxies in empirical capital structure research as the difficulty of finding proxies that are uncorrelated to other proxies that are of interest. Fama and French (2002) also state that the use of panel regressions ignore the bias in the standard errors since the residuals are correlated across years. The coefficient of a proxy variable, if correlated to the other explanatory variables, may thus be measuring the direct effect of the proxy on leverage as well as the indirect effect of the other proxies, thus making inference difficult. Although the estimates are still unbiased, multicollinearity makes estimates inefficient since the variance of the estimated coefficients increases. The inefficiency caused by collinearity is reduced with size and we believe that our sample of 4,398 firms has enough degrees of freedom to render this inefficiency minimal.

Table V indicates that the correlation between the independent variables are generally quite small, which suggest that there is a low degree of first order collinearity between the independent variables. The correlation between non-debt tax shields and EBITDA margin is very large however which could make estimation difficult. This could mean that the negative correlation

between non-debt tax shields and short-term leverage observed in table V may be due to a large positive correlation between non-debt tax shields and EBITDA margins as a result of their common denominators. Although an inverse relationship is expected, it should be noted that this ratio could possibly be a proxy for other determinants of capital structure. For instance, firms with relatively larger depreciation are more likely to have less growth opportunities and a greater ratio of tangible assets to total assets (Ozkan, 2001).

In order to test whether our results are robust, we perform several regressions with alternative proxies. For instance, EBITDA-margin was replaced by ROA as a proxy for profitability and log of total assets was replaced by log of sales as a proxy for size. These alternative regressions did not produce any significant differences to our original proxies. In addition, to further strengthen our result we carried out three regressions with different number of lags. The regressions were performed with no lags, one lag and two lags respectively, for all of the independent variables. The regressions indicate that size and profitability are not the only determinants to have a lagged effect on leverage, see appendix. Risk, asset structure and age also seem to be related to leverage on a one lagged basis. Increasing the lagged effect to two periods heavily reduces the economic and statistical significance for all variables as well as the R^2-values. Profit and asset structure are still economically meaningful and statistically significant with two lags. As a final robustness check we change the definition of a SME firm to that used by Hall *et al.* (2004), i.e. that the firm has less than 200 employees. Once again the regression results did not change to a great extent compared to the previous definition, further strengthening our results.

The results provide evidence that there exists a relationship between firm characteristics and firm borrowing behavior and that this relationship seems to differ between SMEs and large firms. In case there is such a relationship, then firms should have different long-run target debt ratios (Ozkan, 2001). Myers (1984) notes that within the static trade-off theory there are costs associated with adjusting a firm's capital structure towards the long-term target. These costs cause firms to gradually move towards the long-term target and as a result past leverage should be one of the determinants of future leverage. In such a setting a dynamic panel framework would be required, e.g. a Generalized Method of Moments (GMM) estimation (Ozkan, 2001).

A problem of endogeneity could occur if a shock, observable or unobservable, affects both the capital structure of a firm and other firm-specific characteristics, e.g. the asset structure. Furthermore, reversed causality can never be excluded, i.e. leverage ratios might affect the determinants rather than vice versa. However, our use of static panel data methodology allows us to control for these problems by including firm and time specific effects. There are also other methods of dealing with problems of endogeneity, such as using an instrument variable in a two-stage least

square regression (2SLS) or the GMM. Sogorb-Mira and López-Gracia (2003) uses both static panel regression, GMM and 2SLS estimation methods and find no significant differences between the results.

VIII. Summary and Conclusion

This paper's objective is to contribute to the limited research of differences between the unobservable determinants of capital structure for Swedish SMEs and large firms. While our results from the static panel data regressions are not conclusive, they generally support the pecking order theory and the static trade-off theory. In particular, our results show evidence of asset structure, defined as the ratio of tangible assets to total assets, to be the most important determinant of borrowing decisions regardless of firm group belonging. In addition, there also seems to be substantial differences in how the determinants of capital structure affects leverage between SMEs and large firms.

Asset structure and profitability affects capital in the same way for both groups, but the magnitude is substantially higher for SMEs. This relationship might be a result of SMEs typically having relatively more short-term debt than large firms. Therefore SMEs substitute expensive short-term debt for cheaper long-term debt to a greater extent than large firms when they have collateral. By the same reasoning they use internally generated funds rather than short-term debt to finance investments once profitable. Along with asset structure and profitability, non-debt tax shields seems to be the factor which influence SMEs borrowing behavior the most. Any such relationship for large firms could not be found and we believe that the relationship for SMEs is an indirect effect of asset structure due to collinearity between the explanatory variables. Our results indicate that there is a positive relationship between long-term leverage and size for large firms, whereas a similar relationship for SMEs could not be found. This suggests that SMEs face several constraints, such as transaction costs, information asymmetries and bankruptcy risk, which prevents them from lending long-term regardless of size. Interestingly there seems to exist a size threshold within the large group where these constraints are relaxed, consequently allowing larger firms to employ more long-term financing. Growth opportunities and risk are determinants which do not seem to affect leverage on a decomposed level, neither for SMEs or large firms. On the other hand, risk seems to influence total debt for SMEs negatively to a greater extent than large firms. Hence, risk appears to be more important for lenders to consider when evaluating SMEs since they enjoy less protection against bankruptcy in terms of fixed assets etc. than large firms. In contrast to our hypothesis, our results do not only indicate limited incentives to increase leverage because of taxes, but show that higher effective tax rate should decrease leverage. The unexpected positive relationship between

age and short-term debt for large firms can possibly be explained by the fact that long-term loans that mature within a year, if not renewed, become short-term loans in the balance sheet as the firm grows older.

In general, our results indicate that SMEs' borrowing decisions are to a greater extent more sensitive to the chosen determinants of capital structure. This implies that there are other characteristics which might affect large firms, not captured by our setting. To better understand the differences between SMEs and large firms, we encourage further research to investigate a broader set of determinants in order to explain differences left unanswered by this paper.

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Appendix

Table IX
Panel Properties

Industry	Firms	Fraction of Total Firms (%)
Construction, Design & Interior Design	775	18%
IT & Telecommunications	160	4%
Retail	348	8%
Real Estate	324	7%
Company Services	177	4%
Hotell & Restaurants	179	4%
Agriculture, Hunting & Fishing	54	1%
Law, Business and Consulting Services	176	4%
Food Processing Industry	72	2%
Media	27	1%
Motor Vehicle Retail	77	2%
Wholesale Trade	420	10%
Advertising, PR & Market Research	47	1%
Repair & Installation	61	1%
Travel & Tourism	9	0%
Technical Consulting	102	2%
Manufacturing	701	16%
Transport & Storage	474	11%
Education, Research & Development	166	4%
Leasing	49	1%
Total	4398	100%

Table X

Mean Leverage Ratios by Industry

Industry	TD/TA	LTD/TA	STD/TA
Advertising, PR & Market Research	0.640	0.057	0.583
Agriculture, Hunting & Fishing	0.567	0.220	0.347
Company Services	0.585	0.150	0.434
Construction, Design & Interior Design	0.645	0.117	0.527
Education, Research & Development	0.605	0.063	0.542
Food Processing Industry	0.636	0.206	0.430
Hotell & Restaurants	0.698	0.209	0.489
IT & Telecommunications	0.561	0.062	0.499
Law, Business and Consulting Services	0.598	0.134	0.464
Leasing	0.591	0.202	0.390
Manufacturing	0.553	0.178	0.376
Media	0.572	0.077	0.495
Motor Vehicle Retail	0.631	0.257	0.373
Real Estate	0.628	0.192	0.436
Repair & Installation	0.583	0.137	0.446
Retail	0.538	0.105	0.433
Technical Consulting	0.591	0.108	0.484
Transport & Storage	0.665	0.26	0.405
Travel & Tourism	0.686	0.088	0.598
Wholesale Trade	0.582	0.166	0.416

Table XI

Expanatory Variable Measures

	Variable	Measure
Dependent	Total Debt / Total Assets	Long-term Debt$_t$ + Short-term Debt$_t$ / Total Assets$_t$
	Long-term Debt	Long-term Debt$_t$ / Total Assets$_t$
	Short-term Debt	Short-term Debt$_t$ / Total Assets$_t$
independent	Effective Tax Rate	Tax$_t$ / earnings before tax$_t$
	Non-Debt Tax Shields	Depreciation$_t$ / Turnover$_t$
	Risk	Var(Net Income)$_t$
	Asset Structure	Tangible Assets$_t$ / Total Assets$_t$
	Size	Log (Total Assets)$_t$
	Age	Log (Age)$_t$
	Growth Opportunities	(Turnover$_t$ / Turnover$_{t-1}$) - 1
	Profitability	EBITDA$_t$ / Turnover$_t$

TABLE XII

Mean Leverage Ratio by Year

Year	SME			Big		
	TD/TA	LTD/TA	STD/TA	TD/TA	LTD/TA	STD/TA
2003	64%	19%	45%	56%	22%	34%
2004	63%	17%	46%	54%	18%	36%
2005	62%	16%	47%	56%	19%	37%
2006	61%	15%	47%	55%	18%	38%
2007	60%	14%	46%	55%	18%	38%
2008	60%	15%	45%	56%	19%	36%
2009	59%	15%	44%	54%	18%	35%
2010	58%	13%	45%	54%	17%	37%

Table XII

Regression Results of Effective Tax Rate Effect on Leverage

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
ETR	-0.026	-0.069	0.011	-0.035	-0.015	-0.103
	(-1.80)	(-8.01)	(0.71)	(-4.11)	(-0.87)	(-11.98)
Constant	0.215	0.143	0.345	0.431	0.561	0.573
	(30.79)	(20.27)	(52.70)	(51.30)	(70.63)	(68.54)
R^2 (within)	0.024	0.038	0.012	0.022	0.012	0.066
R^2 (overall)	0.006	0.019	0.003	0.003	0	0.022
F-statistic	4.36	42.56	2.45	31.21	2.69	83.63
Observations	2121	14446	2121	14446	2121	14446
Year Dummies	YES	YES	YES	YES	YES	YES

Standard errors are given in parenthesis below the coefficients.

Table XIV

Regression Results of Non-Debt Debt Tax Shields's Effect on Leverage

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
NDTS	0.011	0.325	0.063	-0.261	0.074	0.064
	(0.20)	(5.96)	(0.55)	(-5.64)	(0.64)	(1.23)
Constant	0.209	0.175	0.346	0.451	0.555	0.626
	(31.93)	(56.82)	(49.16)	(155.00)	(67.41)	(201.18)
R^2 (within)	0.022	0.041	0.012	0.027	0.012	0.052
R^2 (overall)	0.004	0.072	0.001	0.055	0.001	0.006
F-statistic	4.18	39.44	2.33	32.88	2.59	63.84
Observations	2121	14446	2121	14446	2121	14446
Year Dummies	YES	YES	YES	YES	YES	YES

Standard errors are given in parenthesis below the coefficients.

Table XV

Regression Results of Variance in Income Effect on Leverage

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
RISK	-0.021	-0.018	0.011	-0.015	-0.011	0
	(-2.94)	(-1.33)	(1.77)	(-1.15)	(-1.61)	(-1.60)
Constant	0.21	0.186	0.348	0.442	0.557	0.55
	(33.14)	(72.63)	(55.17)	(178.53)	(74.94)	(67.18)
R^2 (within)	0.029	0.031	0.013	0.021	0.013	0.051
R^2 (overall)	0.001	0.007	0	0.002	0.003	0.008
F-statistic	5.27	35.15	2.61	28.70	2.85	64.36
Observations	2121	14446	2121	14446	2121	14446
Year Dummies	YES	YES	YES	YES	YES	YES

Standard errors are given in parenthesis below the coefficients.

Table XVI

Regression Results of Asset Structure Effect on Leverage

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
TANGIBILITY	0.166	0.416	-0.128	-0.257	0.038	0.159
	(5.08)	(32.36)	(-4.49)	(-21.09)	(1.01)	(11.73)
Constant	0.153	0.004	0.391	0.499	0.545	0.503
	(11.81)	(0.56)	(33.33)	(58.23)	(36.66)	(54.75)
R^2 (within)	0.051	0.213	0.028	0.087	0.013	0.073
R^2 (overall)	0.43	0.351	0.18	0.224	0.04	0.008
F-statistic	6.94	175.26	4.58	83.33	2.69	81.98
Observations	2121	14446	2121	14446	2121	14446
Year Dummies	YES	YES	YES	YES	YES	YES

Standard errors are given in parenthesis below the coefficients.

Table XVII

Regression Results of Firm Size Effect on Leverage

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
SIZE	0.037	0.032	-0.029	-0.03	0.008	0.003
	(3.86)	(7.60)	(-2.85)	(-6.14)	(0.69)	(0.53)
Constant	-0.314	-0.142	0.748	0.739	0.434	0.597
	(-2.47)	(-3.45)	(5.58)	(15.73)	(2.81)	(12.92)
R^2 (within)	0.035	0.029	0.024	0.038	0.014	0.05
R^2 (overall)	0.051	0.054	0.069	0.15	0	0.002
F-statistic	5.26	25.51	3.81	36.14	2.82	60.49
Observations	1869	12406	1869	12406	1869	12406
Year Dummies	YES	YES	YES	YES	YES	YES

Standard errors are given in parenthesis below the coefficients.

Table XVIII

Regression Results of Age Effect on Leverage

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
AGE	-0.005	-0.008	0.015	-0.047	0.01	-0.055
	(-0.18)	(-0.98)	(0.69)	(-5.24)	(0.34)	(-5.95)
Constant	0.225	0.206	0.302	0.565	0.526	0.771
	(2.69)	(9.66)	(4.49)	(23.53)	(5.78)	(31.40)
R^2 (within)	0.022	0.03	0.012	0.025	0.011	0.056
R^2 (overall)	0.003	0.002	0.005	0.057	0.002	0.033
F-statistic	4.18	35.05	2.47	31.43	2.57	65.72
Observations	2121	14446	2121	14446	2121	14446
Year Dummies	YES	YES	YES	YES	YES	YES

Standard errors are given in parenthesis below the coefficients.

Table IXX

Regression Results of Growth Opportunities on Leverage

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
GROWTH	0.007	0	0.022	0.014	0.028	0.014
	(1.56)	(0.13)	(3.44)	(4.29)	(3.88)	(3.68)
Constant	0.18	0.17	0.36	0.449	0.539	0.618
	(30.84)	(70.47)	(64.56)	(197.68)	(87.02)	(244.96)
R^2 (within)	0.014	0.015	0.025	0.031	0.032	0.053
R^2 (overall)	0.002	0.003	0	0.005	0.001	0.008
F-statistic	3.09	15.76	4.06	35.91	5.07	61.27
Observations	1893	12444	1893	12444	1893	12444
Year Dummies	YES	YES	YES	YES	YES	YES

Standard errors are given in parenthesis below the coefficients.

Table XX

Regression Results of Profitability on Leverage

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
PROFIT	-0.004	-0.072	-0.05	-0.107	-0.054	-0.179
	(-0.25)	(-4.94)	(-2.28)	(-5.62)	(-2.25)	(-7.14)
Constant	0.176	0.175	0.37	0.459	0.546	0.634
	(44.29)	(67.47)	(87.41)	(177.53)	(104.05)	(213.02)
R^2 (within)	0.014	0.019	0.018	0.031	0.019	0.07
R^2 (overall)	0	0.001	0.035	0.054	0.004	0.038
F-statistic	2.84	18.70	3.05	37.65	3.76	66.06
Observations	1869	12406	1869	12406	1869	12406
Year Dummies	YES	YES	YES	YES	YES	YES

Standard errors are given in parenthesis below the coefficients.

Table XXI

Hausman's Specification Test

	(b) ran	(B) fix	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ETR	-0.038	-0.038	0.001	.
NDTS	0.13	0.095	0.035	0.02
RISK	-0.024	-0.028	0.004	.
TANGIBILITY	0.365	0.21	0.155	.
SIZE	0.024	0.036	-0.012	.
AGE	-0.03	-0.047	0.017	.
GROWTH	0.021	0.019	0.002	.
PROFIT	0.014	-0.017	0.03	.

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ho and Ha; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)

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Prob>chi2 = 0.0000

(V_b-V_B is not positive definite)

All statistics are Chi-squared distributed with 8 degrees of freedom and have a p-value of 0.0000

Table XXII

Regression Results with One Lag

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
ETR.L1	-0.001	0.000	-0.001	0.000	-0.001	0.000
	(-1.77)	(0.26)	(-1.33)	(-0.22)	(-2.37)	(0.04)
NDTS.L1	0.019	0.068	0.143	-0.111	0.162	-0.043
	(0.41)	(1.44)	(1.28)	(-2.73)	(1.28)	(-0.66)
RISK.L1	-0.02	0.000	0.010	0.000	-0.009	0.000
	(-2.17)	(-0.72)	(1.23)	(2.85)	(-0.98)	(2.05)
TANGIBILITY.L1	0.092	0.149	-0.042	-0.067	0.05	0.081
	(3)	(8.98)	(-1.3)	(-4.25)	(1.23)	(4.82)
SIZE.L1	0.024	0.022	-0.017	-0.027	0.008	-0.005
	(2.21)	(4.74)	(-1.4)	(-4.35)	(0.53)	(-0.74)
AGE.L1	-0.007	-0.024	0.092	-0.016	0.084	-0.039
	(-0.22)	(-2.04)	(1.97)	(-1.22)	(1.79)	(-3.01)
GROWTH.L1	0.001	-0.003	0.009	0.008	0.01	0.005
	(0.19)	(-1.12)	(1.19)	(2.15)	(1.19)	(1.36)
PROFIT.L1	-0.015	-0.067	-0.045	-0.090	-0.060	-0.157
	(-0.76)	(-3.9)	(-2.12)	(-3.88)	(-2.29)	(-5)
R2 (within)	0.040	0.048	0.040	0.059	0.038	0.072
R2 (overall)	0.213	0.287	0.003	0.306	0.003	0.079
F-statistic	5.78	75.09	4.11	46.73	4.07	56.66
Observations	1869	12406	1869	12406	1869	12406
Year Dummies	YES	YES	YES	YES	YES	YES

Table XXII present the results from the fixed effects static panel data regressions. Our panel data model is: $Y_{it}=X_{it}\times\beta+\eta_i+\eta_t+\mu_{it}$ where X_{it} is a matrix which contains all the explanatory variables, β is the coefficients which we estimate as determinants of capital structure, η_i is the unobservable individual effects, η_t is the time specific effect and uit is the error term. In the model i denotes the cross section of the data ranging from 1 to 4,398 and t denotes the time-series dimension of the data ranging from 1 to 5 (2006-2010). t-values are given in parenthesis below the coefficients. All explanatory variables have one lag.

Table XXIII

Regression Results with Two Lags

	LONG TERM DEBT		SHORT TERM DEBT		TOTAL DEBT	
Variable	LARGE	SME	LARGE	SME	LARGE	SME
ETR.L2	0.000	0.001	0.001	0.000	0.000	0.001
	(-0.98)	(0.87)	(1.53)	(0.17)	(0.42)	(1.51)
NDTS.L2	0.010	0.029	0.231	-0.013	0.241	0.016
	(0.18)	(0.49)	(1.93)	(-0.34)	(1.99)	(0.24)
RISK.L2	-0.001	0.000	-0.010	0.000	-0.011	0.000
	(-1.01)	(-0.88)	(-5.88)	(2.97)	(-5.53)	(3.4)
TANGIBILITY.L2	-0.025	-0.004	-0.014	0.008	-0.039	0.004
	(-0.77)	(-0.28)	(-0.41)	(0.46)	(-0.83)	(0.22)
SIZE.L2	0.012	0.002	-0.002	-0.024	0.010	-0.022
	(1.25)	(0.4)	(-0.18)	(-3.94)	(0.8)	(-3.75)
AGE.L2	-0.032	-0.004	0.089	-0.019	0.057	-0.022
	(-0.69)	(-0.28)	(1.07)	(-1.22)	(0.72)	(-1.47)
GROWTH.L2	-0.009	0.000	-0.004	0.000	-0.013	0.000
	(-1.69)	(0.02)	(-0.36)	(0.09)	(-1.19)	(0.13)
PROFIT.L2	0.05	-0.006	-0.08	-0.04	-0.03	-0.046
	(1.61)	(-0.41)	(-3.13)	(-1.91)	(-0.83)	(-2.01)
R2 (within)	0.031	0.003	0.057	0.046	0.048	0.119
R2 (overall)	0.017	0.000	0.001	0.18	0.014	0.068
F-statistic	2.09	1.05	4.9	17.97	4.37	56.66
Observations	1325	8363	1325	8363	1325	8363
Year Dummies	YES	YES	YES	YES	YES	YES

Table XXIII present the results from the fixed effects static panel data regressions. Our panel data model is: $Y_{it}=X_{it}\times\beta+\eta_i+\eta_t+\mu_{it}$ where X_{it} is a matrix which contains all the explanatory variables, β is the coefficients which we estimate as determinants of capital structure, η_i is the unobservable individual effects, η_t is the time specific effect and uit is the error term. In the model i denotes the cross section of the data ranging from 1 to 4,398 and t denotes the time-series dimension of the data ranging from 1 to 4 (2007-2010). t-values are given in parenthesis below the coefficients. All explanatory variables have two lags.