

Capital structure determinants: the evidence from listed and unlisted Dutch firms

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ABSTRACT,

the capital structure of firms listed on stock exchanges has received extensive coverage in the scientific literature. This study analyzes the capital structure antecedents of listed and unlisted firms, while using panel data from Dutch companies. The evidence suggests that unlisted firms tend to have more leverage and prefer short-term liabilities. Profitability, earnings volatility, size, growth in assets as well as the collateral value of assets have been discovered to be important determinants of capital structure for the listed and unlisted firms in the Netherlands. It was also found that leverage of private firms is more sensitive to firm profitability, and less sensitive to size and tangibility. The empirical results are in line with previous studies and mainly support arguments made by the Pecking Order Theory.

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Keywords

Capital structure, Dutch companies, listed firms, unlisted firms, pecking order theory, trade-off theory, firm-specific determinant

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1. INTRODUCTION

The viability of a firm in the time of financial deficit depends on the administrative and financial decisions of its managers. These decisions require expertise and analytic capabilities in order to ensure the successful outcomes of the capital structure which will minimize the cost of capital and thus maximize the value of the firm. The sources of funds include: retained earnings, which is the cheapest fund due to the virtual absence of the costs compared to the outside funding; debt, which can increase the financial risk; or equity, which unlike debt does not have to be repaid, but reduces the control of the initial stakeholders.

Theories on capital structure offer a variety of predictions about the composition and characteristics of the securities issued by firms. The most widespread theories among them are the trade-off theory, the pecking order theory, and the agency theory. The core of the trade-off theory refers to the balancing process of costs and benefits of debt which leads to the concept of an optimal capital structure (Myers, 1984). According to the pecking order theory, firms prefer internal financing (for example retained earnings) and then external financing, due to the lower relative cost of internally generated funds compared to other available alternatives (Myers and Majluf, 1984). The agency theory is striving to reduce inefficiencies caused by asymmetric information by increasing or decreasing the relative amount of debt in the capital structure (Myers, 1977; Jensen and Meckling, 1976; Jensen, 1986).

In the last decades, a number of other theories have been developed in order to explain the capital structure. However, no theory or research has been able to provide an agreement as to what factors affect the decision on the level of leverage in a company (Brealey and Myers, 1991). Frank and Goyal (2009) have identified firm-specific characteristics that are correlated with the leverage decision of publicly traded U.S. firms, which in literature are acknowledged as determinants of capital structure.

The validation of the theories mentioned above is almost exclusively carried out in the context of publicly traded firms, mostly due to the data availability. As a result, a gap in the empirical research on the financial behavior of unlisted firms led to the inadequately covered knowledge domain. An investigation of the determination of the capital structure choice of private¹ firms helps to determine whether the capital structure choice in these companies is related to factors similar to those influencing the capital structure choice in public firms.

This is especially notable in the light of findings of Brav (2009), who identified that British unlisted firms have leverage ratios that are approximately 50 per cent higher than the ones of their listed counterparts. Brav also discovered a significant difference in the maturity structure of debt and equity issues of listed and unlisted firms. The ratio of short-term debt to total debt in unlisted firms is about half as large as for the listed ones, 64 per cent and 37 per cent respectively (Brav, 2009). A study by Schoubben and Hulle (2004) investigated capital structure of listed and unlisted Belgian firms and discovered similar results: unlisted firms hold on average about 65 per cent of their total assets in debt, while for the listed firms the ratio was 56 per cent; they also identified that short-term debt of unlisted firms accounted for 74 per cent of their total leverage, while for the listed firms this ratio was 70 per cent.

The capital structure of Dutch firms has obtained a limited attention from academia. The determinants of capital structure of

public Dutch firms have been investigated by Hall et al. (2004) together with a number of other European countries. Furthermore, Degreyse et al (2012) conducted an investigation of the determinants of capital structure in the Netherlands. This study will contribute to the literature by investigating unlisted Dutch firms and using more recent data compared to previous studies.

In this context the study is investigating the following research question: “Which firm-specific factors are important in determining the capital structure of listed and unlisted Dutch firms?”

This study has a practical application when the regarding the capital structure is made, because it highlights the characteristics which must be taken into account during the decision making process.

Section two of the paper is providing a general overview of capital structure theories and different characteristics of listed and unlisted firms. In the section three, hypotheses on the influences of selected determinants of capital structure on leverage are presented, based on theoretical and empirical evidence. The fourth section describes the data, sources and selection criteria, which is followed by section five and the description of research methodology. In section six the results are presented and discussed. In the section seven a conclusion of the main results, recommendation, as well as the impact of the study to theory and practice are presented.

2. LITERATURE REVIEW

2.1 The Capital Structure Theory

The theories of capital structure aim at explaining how to use the mix of different sources of financing. Those sources can be classified as equity, leverage and hybrid structures (Hillier et al., 2011). Equity refers to common or preferred stocks as well as to retained earnings, while leverage comes in the form of long-term debt, such as bonds and notes payable, or short-term debt in the form of short-term bank loans. The hybrid securities by contrast combine the characteristics of both debt and equity.

The discussion about the best possible amount of leverage a firm should take on started due to the “capital structure irrelevance” theory by Modigliani and Miller (1958). It has been a milestone for the creation of several related theories, developed by relaxing the assumptions made in the initial study. Once the factors of information asymmetry, agency costs, corporate tax, flotation and transaction costs are included in the picture, the capital structure becomes relevant to the value of the firm.

The Trade-off Theory predicts that companies optimize their leverage level and move towards an optimal debt ratio, which is balanced by the tax benefits of debt and the cost of financial distress (DeAngelo and Masulis 1980, Myers, 2001). The tax shield arises from the tax deductibility of interest payments. However, large tax shields can be outweighed by the increased probability to default and the expected cost of bankruptcy (Warner, 1977).

The Pecking Order Theory states that the company follows an order of preferences in its financing decisions (Myers and Majluf, 1984; Myers, 1984). The arguments are based on information costs and signaling effects. Myers and Majluf (1984) show that firms prefer internally generated cash flows; when this source is exhausted, they move on to debt. When the latter source does not suffice to fulfill the financing needs, additional equity is

¹ In scope of this paper companies are referred to as to private and public in a sense of being unlisted or listed on a stock exchange respectively

issued. This hierarchy takes place due to differences in costs of financing. Equity issuance is the most expensive source of financing, since it suffers the most from the information asymmetry² between insiders and potential outside investors. Debt is by contrast less sensitive to information problems, due to its fixed payments and since internally generated funds do not face issuing costs. Thus, according to the Pecking Order Theory, external financing is used when there is an imbalance between internal resources and real investment opportunities. In this case, there is no optimal debt ratio and the observed capital structure of a firm is the sum of the past financing events.

The Agency theory focuses on agency conflicts, caused by asymmetric information, between managers, owners and debt holders as well as on their influences on the capital structure. Managers are agents of the owners, but their interests may differ. Managers can pursue their personal interests at the expenses of the owners by overinvesting free cash flow in negative net present value (NPV) projects (overinvestment problem) (Jensen, 1986). This potential problem can be mitigated by an increased leverage: the interest payments reduce the cash flow available for spending. Further, managers of highly leveraged firms will be less able to abuse their position, since bondholders monitor such firms more closely. The agency conflict between debtholders and owners arises when a highly debt-financed firm forgoes good investment opportunity, due to the possible sharing of the future proceeds with debtholders (underinvestment problem) (Myers, 1977). Another conflict between these parties can occur if an investment yields returns that are higher than the cost of debt. In this case, owners are receiving gains and debtholders are exposed to the higher risk of possible losses due to limited liability of the owners (risk-shifting problem) (Jensen and Meckling, 1976).

In the theories described above firm-specific factors, or determinants of capital structure, are used to measure the theories. The influence of the *determinants of capital structure* has been studied extensively (Titman and Wessels, 1988; Rajan and Zingales, 1995; Booth et al., 2001), although their effect is still controversial. The inconsistencies in the results obtained by different researchers can occur due to differences in their research design as well as characteristics that are specific to the investigated sample. Appendix 1 contains an overview of the literature about the determinants of capital structure. The determinants that have been further investigated in this study are the firm profitability, risk, size, growth opportunities, and tangibility, which have been previously studied by Booth et al. (2001), Drobez and Fix (2003), Shah and Khan (2007). They were chosen due to their established effect on the leverage of public companies (Rajan and Zingales, 1995; Cole, 2013), which assures their applicability to the nature of private companies. Schoubben and Hulle (2004) investigated the same determinants in their study about the capital structure of listed and unlisted Belgian firms.

2.2 Stock Listing and Leverage

Listed and non-listed firms are likely to differ in many ways, among others in their corporate strategies, investment opportunities, financial constraints and information conditions. This section aims to investigate the characteristics, which have a potential effect on leverage and the difference between them with regard to the stock listing.

Listed companies. Public firms, compared to private ones, have a substantially lower cost of equity capital, due to their established market price and less information asymmetry at the time when capital is raised (Maksimovic, Phillips, and Yang,

2013). Listed firms have lower costs for bank credits and are able to borrow from more banks, due to their high bargaining power (Pagano et al, 1998). Thus, the main advantage associated with stock exchange listing is easier and lower-cost access to external capital.

Informative stock prices create a possibility to optimize managerial compensation schemes. The stock listing can also be seen as a disciplining device, due to the threat of a hostile takeover and the exposure of managerial decisions to the assessment of the market (Allen, 1993). Listed companies have dispersed ownership, which may create agency problems and information asymmetries between owners and managers. According to Mayer and Alexander (1991), public companies show higher growth and are more profitable than their private counterparts.

Unlisted companies. Due to the concentrated ownership structure and the significant degree of control over the firm of each shareholder (Mayer and Alexander, 1991), the cost of issuing equity (and thus giving up control over the firm) is higher for unlisted companies than for listed companies (Brav, 2009). Furthermore, private firms are exposed to a higher information asymmetry between insiders and outsiders at the time when capital is raised, compared to public firms. These are the reasons behind rather passive financial policies of private firms (Brav, 2009). Hence, non-listed companies are less likely to raise or retire capital. In order to avoid high agency costs associated with equity issue, private firms prefer internally generated finance (Brav, 2009). Once the internally generated funds are used up, private firms prefer short-term financing due to the lower information asymmetry associated with this source of funds, compared to long-term debt (Pettit and Singer, 1985; Brav 2009). Empirical evidence suggests, that leverage is drastically higher in unlisted firms, which is consistent with their need to rely on debt and internally generated equity (Brav, 2009; Gao, Harford, and Li, 2013; Asker, Farre-Mensa, and Ljungqvist, 2014).

As previously mentioned, the ownership structure of private firms is concentrated, thus debt as disciplining device is used less. Mayer and Alexander (1991) discovered that unlisted firms are smaller on average and are less diversified.

3. HYPOTHESES FORMULATION

In this section the hypotheses are described based on the theoretical premises and empirical evidence. The variables that have been tested regarding the determinants of the capital structure are profitability, risk, size, growth opportunities and asset tangibility. Each determinant is at first discussed from the perspective of the theories presented in the literature review (Section two), then empirical evidence is presented and in some cases, private-firm specific predictions have been made.

Profitability plays an important role in leverage decisions and measures the earning power of a firm in contrast to its expenses. From the Trade-off Theory perspective, a positive effect of profitability on leverage is expected, since profitable companies are exposed to a lower risk of bankruptcy, and thus are able to sustain more debt and benefit from a high-interest tax shield (Modigliani and Miller, 1963). The Pecking Order Theory perspective predicts, that companies prefer financing through internally generated funds, in second place debt and as a last resort new equity (Myers and Majluf, 1984). Therefore, highly profitable firms can generate retained earnings and should have lower debt. The Agency theory makes a positive prediction about the relationship between profitability and leverage: firms with an

² If the new project is funded by issuing equity, strict underpricing by the new investors may capture more than the NPV of the project, which results in a net loss to existing owners.

excess cash flow will have higher debt levels in order to mitigate the overinvestment problem (Jensen 1986).

The prediction made by the Trade-off Theory is less generalizable in the case of unlisted firms, due to the higher relative cost of debt to internally generated funds. Unlisted firms prefer internal financing since it has virtually no costs. Following the argument made by the Pecking Order Theory, profitable firms will have higher retained earnings, and thus a negative relationship is expected between the leverage and profitability of private firms.

Studies using data from listed companies consistently find a negative relationship between profitability and all types of leverage (Titman and Wessels, 1988; Rajan and Zingales, 1996; Pandey, 2001; Huang and Song, 2005; Degryse et al., 2012). Thus, based on the theoretical and empirical evidence, I hypothesize that:

H1: Irrespective of the firm type, profitability has a negative relationship with leverage.

Risk. Earnings volatility can arise from inefficient management practices or be an essential business risk in the operations of a firm. Since higher income variability increases the probability of financial distress, the Trade-off Theory perspective dictates a negative effect of risk on leverage. The information asymmetry associated with earnings volatility leads to an increased risk premium demanded by the external lenders and investors (Greenwald and Stiglitz, 1990). Since indirect (cost of financial distress) and direct costs of debt increase with risk, a negative relationship between leverage and risk is implied by the Pecking Order Theory.

The Agency theory is supporting the positive effect of risk on leverage. An increased risk indicates a higher information asymmetry between managers and owners, and thus in order to avoid the problem of overinvestment debt can be increased (Jensen, 1986). The agency problem between debt holders and shareholders becomes more severe in the case of increased risk, since shareholders have an incentive to engage in risk-shifting activities and finance their projects with debt (Jensen and Meckling, 1986).

The predictions of the Trade-off Theory and the Agency theory are the same in the case of unlisted firms. Given the initial higher relative cost of equity to debt for private firms, it can be assumed, that information asymmetry caused by earnings volatility would further increase the costs proportionally. Thus, at the time when external capital is raised, private firms will follow the hierarchy predicted by the Pecking Order Theory and prefer leverage over equity.

Empirical evidence from the listed companies suggests a negative relationship between risk and leverage (Booth et al., 2001; Pandey, 2001; Fama and French, 2002; Drobek and Fix, 2003; Akhtar and Oliver, 2009). Therefore, the following hypothesis is formulated based on theory and empirical findings:

H2: Risk has a negative relationship with leverage of public firms and a positive relationship with leverage of private firms.

Size can be considered as a proxy of a probability of default: larger firms are more diversified and considered to have less volatile assets, therefore, they are less likely to fail. Since large firms are less prone to bankruptcy, the Trade-off Theory expects that these firms would have more debt. Lower risk and asset diversification associated with increased size lead to lower information asymmetry between insiders and outside investors. Therefore, cost of debt, relative to internally generated funds, decreases and leverage becomes more attractive. Following this argument, the Pecking Order Theory predicts a positive relationship between size and debt. As size increases, so does the

information asymmetry between owners and managers, thus the Agency theory predicts a positive relationship between debt and leverage, since it can be used to mitigate the overinvestment problem.

The predictions of the Trade-off, the Pecking Order and the Agency theory on the influence of size on leverage are the same irrespective of the types of firm.

Literature supports the proposed arguments: size and leverage of listed firms have been found to correlate positively (Booth et al., 2001; Drobek and Fix, 2003; Huang and Song, 2006; Akhtar and Oliver, 2009; Degryse et al., 2012). With respect to the theories and empirical evidence, I hypothesize, that:

H3: Irrespective of the firm type, size has a positive relationship with leverage.

Growth opportunities. Fast growing firms are associated with a higher probability of bankruptcy, either due to inability to keep pace with their expansion or because firms with growth opportunities may invest suboptimal (Harris and Raviv, 1990). Growth opportunities are also intangible, thus they increase the value of the firm, but cannot be collateralized (Myers, 1984). Due to the increased risks associated with high growth, the Trade-off Theory predicts a negative relationship between a given determinant and the leverage of a company. It is expected that a growing firm will not be able to fill their financial needs with internally generated funds, thus the pecking order theory implies an increase in the debt level. Growth opportunities, from the Agency theory perspective, are associated with the underinvestment problem, due to the fact that highly leveraged growing firms are likely to pass up profitable investment opportunities. Thus, a negative relationship between growth and leverage is predicted by the Agency theory.

The predictions of the Trade-off Theory, the Pecking Order Theory and the Agency theory about the magnitude of the relationship between growth opportunities and leverage for listed companies, holds for unlisted firms as well.

The empirical evidence based on listed firms also shows mixed predictions: a positive relationship between debt and growth opportunities was found by Kester, (1986) and Titman and Wessels (1988); although a larger body of literature discovers a negative relationship (Rajan and Zingales, 1995; Fama and French, 2002; Shah and Khan, 2007; Cole, 2013; Degryse et al., 2012). Thus, based on theory and empirical evidence, I hypothesize that:

H4: Irrespective of the firm type, growth opportunities have a negative relationship with leverage.

Tangibility represents the collateral value of assets. A firm with a relatively large proportion of tangible assets has a higher liquidation value and, hence a lower expected cost of financial distress. Based on this argument, the Trade-off Theory predicts a positive relationship between the proportion of tangible assets and leverage. The collateral value of assets can be used to reduce the direct cost of debt by issuing a secured version of the type of financing that is given. From the perspective of the Pecking Order Theory debt becomes more attractive as a financing mean, thus the relationship between tangibility and leverage are expected to be positive.

From the Agency theory perspective, it can be argued, that for firms with less collateralized assets the monitoring of the agency cost associated with overinvestment is costly, therefore these firms might voluntarily choose higher debt levels to shift the control over managers to bondholders. Thus, the Agency theory predicts a negative relationship between tangibility of assets and leverage.

The predictions about the effects of the proportion of tangible assets on leverage made by the Trade-off Theory, the Pecking Order Theory and the Agency theory are the same for listed and unlisted companies.

The empirical evidence from listed firms is mixed. A positive relationship between tangibility and debt was identified by Rajan and Zingales (1995), Frank and Goyal (2002), Chen (2004), Huang and Song (2005), Cole (2013) and Degryse et al. (2012). A negative relationship was discovered by Booth et al. (2001) and Drobez and Fix (2003).

Since the theories make different predictions about the magnitude of the relationship between the tangibility of assets and leverage, hypothesis five is determined by a large body of empirical evidence:

H5: Irrespective of the firm type, tangibility has a positive relationship with leverage.

4. DATA

The dataset for the study has been provided by Bureau van Dijk (BvD). The data on unlisted firms was sourced from REACH database, which has information about the majority of Dutch companies, including private ones. The data on firms listed on Amsterdam stock exchange has been obtained from the ORBIS database, which contains data on large companies from around the world. Firms with the required data items for at least one of the years observed have been selected. Data items include total debt, long-term debt, short-term debt, total and fixed assets and economic profit before interest and tax (EBIT).

The sample consists of panel data for the years 2010 to 2016 and uses a set of non-financial Dutch firms. For the purpose of this study public and private limited liability organizations are included in the sample. Financial companies by contrast, such as banks and insurance companies, are excluded from the sample due to the strong explicit and implicit influence of investor insurance schemes (e.g. deposit insurance) on their leverage; apart from that minimum capital requirements directly affect their capital structure (Rajan and Zingales, 1995). Following Brav (2009) small unlisted firms are excluded from the sample. In order to clean outliers, the data was winsorized at the 2.5 per cent and 97.5 per cent levels. This resulted in a sample of 1917 companies and 10332 firm-year observations (195 firms and 1155 firm-year observations for listed and delisted firms; 1722 and 10332 for private firms respectively).

To ensure better comparability, a matched sample of public and private firms was constructed. The samples of private and public firms were matched based on SBI codes and the absolute value of total assets in order to control for the effect of the size of the firms. Following Gao et al. (2013) and Akguc et al. (2013) a pair of firms was admitted to the sample, in case the average total assets of the larger firm are twice (or less) as big as the assets of the smaller pair member. The process resulted in 55 matched pairs.

5. RESEARCH METHODOLOG

5.1 Regression Models

The sample contains data across firms and over time, thus panel data methods are employed. Not all firms have observations for all years of analysis, which makes the dataset unbalanced. The sample is split into listed and unlisted groups.

In order to control for the firms' non-observable individual effects on the estimated parameters the fixed effect model is used. All variables are indexed with i for the firm and t for the year of observation. The basic panel data regression model can be specified as follows:

$$y_{it} = a + X'_{it-1} \times \beta + Y_t + \varepsilon_{it} \quad (1)$$

Where y_{it} can take the form of different leverage ratios; a is the intercept of the regression line; X'_{it-1} is a $1 \times k$ vector of observations on k explanatory variables (profitability, risk, size, growth opportunities, and tangibility); β is a $k \times 1$ vector of parameters. Independent variables used in the regressions are lagged by one year, in order to avoid potential endogeneity issues. Y_t are used for the year fixed effect.

The choice of a fixed effect model was statistically verified with a Hausman test, which rejected the null hypothesis that the individual effect of a firm and the independent variables are uncorrelated. The fixed effect regression model is widely used in the studies on the determinants of capital structure (Booth et al., 2001; Drobez and Fix, 2003; Chen, 2004; Shah and Khan, 2007; Degryse et al., 2012).

In order to further investigate the influence of the firm-specific determinants on the choice of capital structure and to test the differences between their impact on listed and unlisted firms a Chow test was performed (Wooldridge, 2005). This test was used to compare the strength of regression coefficients for each subsample (López-Gracia and Sánchez-Andújar, 2004; Hillman, 2005).

For a robustness check a pooled ordinary least square (OLS) regression model with robust standard errors has been used. This is another common method in the research of the determinants of capital structure (Pandey, 2001; Sogorb-Mira and Lopez-Gracia, 2003; Huang and Song, 2006; Akhtar and Oliver, 2009). The following regression model was specified:

$$y_{it} = a + PROFIT_{it-1} \times \beta_1 + RISK_{it-1} \times \beta_2 + SIZE_{it-1} \times \beta_3 + GROWTH_{it-1} \times \beta_4 + TNGB_{it-1} \times \beta_5 + C_j + Y_t + \varepsilon_{it} \quad (2)$$

Where i denotes the firm, t for a year of observation and j for an industry. y_{it} can take the form of different leverage ratios; a is the intercept of the regression line; $PROFIT_{it-1}$, $RISK_{it-1}$, $SIZE_{it-1}$, $GROWTH_{it-1}$ and $TNGB_{it-1}$ are the determinants of capital structure of firm i in at $t-1$ (variables are lagged by one year). C_j are industry fixed effect and Y_t are year fixed effect.

Due to the fact that the observations are not independent, but are nested in companies, there is a potential threat to the "independence of residual assumption" (Tomarken and Waller, 2005). In order to control for heteroscedasticity, enlarged standard error terms have been used in the pooled OLS regression.

5.2 Variables Measurement

According to the research objectives and the research question, this study has set, the variables used in this research and their measures are adopted from existing literature.

Leverage can be measured by many different variables (Pandey, 2001; Chen and Hammes, 2003; Leary and Roberts, 2005). This study concentrated on short-term (STD), long-term (LTD) and total debt ratios (TD). These measures of debt ratios examine the capital employed and thus uncover the effects of past financial decisions. Book leverage was used for the given ratios, this measure is consistent with Rajan and Zingales (1995), Sbeiti (2010), Leary and Roberts (2005). Thus, the leverage has been investigated as follows: the total debt ratio was measured as a book value of total debt to total assets; long-term debt ratio was measured as a book value of long-term debt to total asset; short-term debt ratio was measured as a book value of short-term debt to total asset. These proxies of leverage were used by Rajan and Zingales (1995), Booth et al. (2001), Pandey (2001), Shah and Khan (2007) and Degryse et al. (2012).

Profitability (PROFIT). This study follows Utami, 2012 and used the return on assets (ROA) as a proxy for this variable. This ratio represents the contribution of the assets of a firm on the profit creation, and by doing so it measures the earning power of a firm.

Table 1. Descriptive statistics of the dependent and explanatory variables

Panel A. Full sample														
Variables	Mean				Median				S.D		Min		Max	
	Listed	Unlisted	Diff	Value	Listed	Unlisted	Diff	Value	Listed	Unlisted	Listed	Unlisted	Listed	Unlisted
<i>LTD</i>	0.323	0.261	0.062	(5.28 ^A)	0.338	0.185	0.153	(9.94 ^A)	0.170	0.250	0.009	0.001	0.968	0.000
<i>STD</i>	0.243	0.412	-0.169	(-10.83 ^A)	0.214	0.409	-0.195	(-10.57 ^A)	0.167	0.268	0.000	0.000	0.996	0.999
<i>TD</i>	0.574	0.685	-0.111	(-9.12 ^A)	0.568	0.607	-0.040	(-4.40 ^A)	0.390	0.280	0.000	0.000	0.998	1.000
<i>Profitability</i>	0.041	0.069	-0.028	(-7.70 ^A)	0.055	0.065	-0.010	(-8.49 ^A)	0.125	0.115	-0.599	-0.183	0.383	0.585
<i>Risk</i>	0.063	0.064	-0.001	(-0.385)	0.122	0.079	0.033	(7.79 ^A)	0.121	0.079	0.002	0.001	2.426	0.865
<i>Size (€ mill.)</i>	3582	95.7	3486	(43.25 ^A)	534	20.03	513.97	(38.88 ^A)	8169	219	0.152	6.068	80400	1332
<i>Growth opp.</i>	0.097	0.053	0.43	(5.916 ^A)	0.028	0.024	0.004	(0.131)	0.427	0.199	-0.872	-0.509	3.844	1.057
<i>Tangibility</i>	0.552	0.423	0.128	(12.40 ^A)	0.502	0.359	0.143	(13.20 ^A)	0.268	0.339	0.001	0.026	0.995	0.997

Panel B. Matched sample														
Variables	Mean				Median				S.D		Min		Max	
	Listed	Unlisted	Diff	Value	Listed	Unlisted	Diff	Value	Listed	Unlisted	Listed	Unlisted	Listed	Unlisted
<i>LTD</i>	0.303	0.172	0.131	(9.68 ^A)	0.296	0.106	0.190	(8.78 ^A)	0.349	0.268	0.001	0.002	1.573	1.127
<i>STD</i>	0.225	0.433	-0.207	(-11.28 ^A)	0.205	0.451	-0.246	(-10.79 ^A)	0.148	0.189	0.006	0.001	0.473	0.987
<i>TD</i>	0.520	0.610	-0.090	(-6.68 ^A)	0.505	0.561	-0.056	(-4.85 ^A)	0.349	0.268	0.001	0.002	1.573	1.127
<i>Profitability</i>	0.042	0.066	-0.024	(-3.38 ^A)	0.053	0.066	-0.013	(-3.65 ^A)	0.129	0.114	-0.448	-0.183	0.360	0.479
<i>Risk</i>	0.076	0.067	0.009	(0.062)	0.049	0.045	0.004	(0.806)	0.099	0.081	0.002	0.000	0.655	0.697
<i>Size (€ mill.)</i>	324	255	70	(2.29 ^A)	148	82	66	(2.05 ^B)	420	354	374	6.593	2627	1331
<i>Growth opp.</i>	0.111	0.079	0.032	(2.16 ^B)	0.032	0.049	-0.017	(-1.03)	0.456	0.218	-0.872	-0.370	3.844	1.057
<i>Tangibility</i>	0.487	0.396	0.093	(3.97 ^A)	0.477	0.343	0.134	(4.80 ^A)	0.242	0.318	0.020	0.003	0.992	0.997

Table 1 presents the mean, median, standard deviation (S.D), minimum values (Min) and maximum values (Max) for the dependent and independent variables. The T-test statistics for the means test and the Wilcoxon Mann-Whitney Z-statistics for the median tests are given in the respective columns. The superscripts A, B and C indicate statistical significance. A, B and C indicate statistical significance at 1%, 5% and 10% level respectively. Panel A and panel B present the values for the full and the matched samples respectively.

The ROA is calculated as earnings before interest and taxes divided by total assets (Rajan and Zingales, 1995; Chen and Hammes, 2003).

Earnings volatility or risk (RISK). Leary and Roberts (2005) measured earnings volatility as the standard deviation of the return on assets (calculated with earnings before interest and taxes). They based their measure on the previous 10 years of data for a given firm-year observation, however in this study due to data availability the previous 4 years of data for a firm-year observation are considered.

Size is usually calculated as the book value of total assets (Leary and Roberts, 2005; Akhtar and Oliver, 2009; Degryse et al. 2012). The same approach is applied in this study.

Growth opportunities (GROWTH) as an indication of the expected growth of a firm can be measured in a number of ways. Rajan and Zingales (1995) measured growth as Tobin's Q, another approach is to measure it as the ratio of market value of assets to book value of assets (Leary and Roberts, 2005; Sbeiti, 2010). Since those proxies are not applicable to unlisted firms, this study follows Akhtar and Oliver (2009) and their definition of a firm's growth potential as the average percentage change in total assets over the previous year.

Tangibility (TNGB). The prevailing approach for measuring tangibility is to divide the fixed assets by total assets (Drobtz and Fix, 2003; Huang and Song, 2006). This study has used this proxy as well.

6. RESULTS

6.1 Descriptive Statistics

The summarizing statistics of dependent and independent variables, including mean, median, standard deviation, minimum and maximum are reported in Table 1. The table allows a side by side comparison between public and private companies debt ratios, as well as sets of independent variables. Statistics for the T-test, for the means test, as well as the statistics for the Wilcoxon Mann-Whitney Z median tests are presented in the table as well. The descriptive statistics for the full sample and for the matched samples are presented in the Panel A and Panel B respectively.

Unlisted firms hold on average about 69 per cent of their total assets in debt, while for listed companies this ratio is about 57 per cent. This result supports the argument that cost of attracting equity is lower for listed firms. Listed firms have a higher proportion of long-term debt than unlisted firms, 32 per cent, and 26 per cent respectively. The ratio of long-term debt to total debt for public firms is 56 per cent, consistent with findings of Brav (2009). Degryse et al. (2012) identified that 63% of total debt is long-term debt in the case of Dutch companies. However, the short-term debt ratio is higher for private firms (24 per cent for listed and 41 per cent for unlisted firms). The proportion of short-term debt to total debt is significantly higher for unlisted firms (60 per cent and 42 per cent), which in turn supports the argument, that private firms prefer securities with lower

information asymmetry. These proportions are in line with the results of Schoubben and Hulle (2004).

With regard to the explanatory variables, it can be seen that listed companies compared to unlisted are significantly larger (3.58 billion euros versus 95.7 million euros). This gap in the size of the firms decreased in the matched sample: listed and unlisted firms have on average 324 million euros and 255 million euros respectively.

Unlisted firms appear to be slightly more profitable, yet the difference decreases in median terms. A difference in the earnings volatility is present in the full sample and in median

terms only. There is no significant difference in the average risk of private and public firms. On average growth opportunities for listed companies are almost double as large, however when the median is expected there is no significant difference. Mean growth opportunities in the matched sample are higher for listed firms, but the difference is less striking than in the full sample. The difference in the proportion of tangible assets is fairly small and not statistically significant.

6.2 Correlations Results

The report on the correlations between dependent and independent variables in the matched sample are presented in

Table 2. Correlation matrix

Panel A. Listed firms								
Variables	<i>Long-term debt ratio</i>	<i>Short-term debt ratio</i>	<i>Total leverage</i>	<i>Profitability</i>	<i>Earnings volatility</i>	<i>Size</i>	<i>Growth opportunities</i>	<i>Tangibility</i>
<i>Long-term debt ratio</i>	1.000							
<i>Short-term debt ratio</i>	-0.138 ^A (0.002)	1.000						
<i>Total leverage</i>	0.616 ^A (0.000)	0.579 ^A (0.000)	1.00					
<i>Profitability</i>	-0.113 (0.713)	-0.079 ^B (0.022)	-0.125 ^A (0.003)	1.000				
<i>Earnings volatility</i>	-0.036 (0.333)	-0.175 ^A (0.000)	-0.186 ^A (0.000)	-0.284 ^A (0.000)	1.000			
<i>Size</i>	-0.012 (0.706)	-0.041 ^A (0.000)	0.339 ^A (0.000)	0.222 ^A (0.000)	-0.162 ^A (0.000)	1.000		
<i>Growth opportunities</i>	0.093 (0.713)	0.002 (0.966)	0.078 ^C (0.060)	-0.034 ^A (0.000)	0.062 ^C (0.078)	0.036 (0.265)	1.000	
<i>Tangibility</i>	0.281 ^A (0.000)	0.218 ^A (0.000)	0.132 ^A (0.001)	0.097 ^A (0.003)	-0.083 ^A (0.000)	0.383 ^A (0.000)	-0.026 (0.417)	1.000

Panel B. Unlisted firms								
Variables	<i>Long-term debt ratio</i>	<i>Short-term debt ratio</i>	<i>Total leverage</i>	<i>Profitability</i>	<i>Earnings volatility</i>	<i>Size</i>	<i>Growth opportunities</i>	<i>Tangibility</i>
<i>Long-term debt ratio</i>	1.000							
<i>Short-term debt ratio</i>	-0.199 ^A (0.000)	1.000						
<i>Total leverage</i>	0.515 ^A (0.000)	0.5974 ^A (0.000)	1.000					
<i>Profitability</i>	-0.157 ^B (0.032)	-0.074 ^A (0.001)	-0.131 ^B (0.015)	1.000				
<i>Earnings volatility</i>	0.134 ^A (0.000)	0.106 ^A (0.000)	0.119 ^B (0.013)	-0.089 (0.179)	1.000			
<i>Size</i>	0.060 ^A (0.000)	-0.116 ^A (0.000)	0.026 ^B (0.031)	0.084 (0.118)	-0.148 ^A (0.019)	1.000		
<i>Growth opportunities</i>	0.119 ^C (0.099)	0.087 ^C (0.095)	0.024 ^B (0.016)	0.003 (0.943)	0.171 ^A (0.007)	0.104 ^B (0.044)	1.000	
<i>Tangibility</i>	0.239 ^A (0.001)	0.166 ^A (0.000)	0.217 ^A (0.001)	-0.105 ^A (0.000)	0.003 (0.967)	0.346 ^A (0.000)	0.011 (0.841)	1.000

Table 3 presents the pairwise correlation between all regression variables. Panel A presents the values for listed firms; Panel B indicates the regression coefficients for unlisted companies. P-values associated with the pairwise correlation are in parenthesis. The superscripts A, B and C indicate statistical significance. A, B and C indicate statistical significance at 1%, 5% and 10% level respectively.

Table 2. As expected, there is a large positive and statistically significant correlation between short- and long-term debt ratios and total leverage ratios. Short-term and long-term debt ratios are negatively correlated.

Profitability has a statistically significant negative relationship with debt ratios of listed and unlisted firms; the exception is short-term debt of listed companies where the correlation is not statistically significant. This relationship is consistent with the prediction made by the Pecking Order Theory for the given determinant.

Earnings volatility of listed firms has a negative relationship with short-term and total debt ratios, which is consistent with the Trade-off Theory and Pecking Order Theory. Weak, yet statistically significant, positive correlations between debt ratios and risk are identified for the unlisted firms.

Size has a positive correlation with the total debt of both of both company types, as well as with long-term debt of unlisted firms. This is consistent with the predictions of the capital structure theories. However, a weak and moderate negative correlation exists between short-term debt and the size of listed and unlisted firms respectively.

Growth opportunities have a weak positive relationship with total debt irrespective of the company type, as well as with short-term and long-term debt of private companies. This correlation supports the prediction made by the Pecking Order Theory. Tangibility has a weak to moderate positive correlation with all types of debt, which is in line with arguments made by the Pecking Order Theory and the Trade-off Theory.

There is a moderate correlation between tangibility and size for both company types. Thus, the results for those variable have to be interpreted with caution. Correlations between other variables are low, thus multicollinearity is not a concern. Based on the two correlation matrixes it can be stated that the determinants of capital structure are fairly similar for listed and unlisted firms.

6.3 Regression Results

In order to test which determinants of capital structure are important for listed and unlisted Dutch companies a fixed effect regressions with year dummies have been used. The results of the regressions for long-term debt, short-term debt, and total debt are reported in Table 3. It can be concluded from the table that independent variables explain around 30-39 per cent of the

variance in the long-term debt, 38-53 per cent of the changes in short-term debt and 26-28 per cent in the case of total debt.

Profitability has a moderate negative relationship with all types of debt (p-value < 0.01) irrespective of the company type. This relationship contradicts predictions made by the Trade-off Theory and Agency theory, but supports the Pecking Order Theory. Due to the ability of profitable firms to generate retained earnings, they are able to use less leverage. Thus, the findings are in line with the first hypothesis (H1). This result is consistent with the majority of the empirical findings, namely of Kester (1986), Barcalay, Marx and Smith (1996), Pandey (2001) and Akhtar and Oliver (2009).

Risk has a weak negative relationship with long-term and short-term debts of listed firms (p-value < 0.01). These results are in line with the predictions of the Trade-off Theory and Pecking Order Theory. Firms with high earnings volatility will have lower leverage, due to the increase in the direct and indirect costs of debt associated with risk. This relationship was also identified by Booth et al. (2001), Pandey (2001), Fama and French (2002), Drobek and Fix (2003) and Akhtar and Oliver (2009). However, a weak positive relationship was found for all types of debt in the case of unlisted firms (p-value < 0.01). Hence, unlisted risky firms are more likely to issue debt. This can occur due to the further increase in the information asymmetry faced by private firms, which makes equity even more unattractive at the time when external capital is raised. Thus, the findings for earnings volatility support the second hypothesis (H2).

Size has a weak positive relationship with long term debt of listed and total debt irrespective of the company type (p-value < 0.05 for listed firms and p-value < 0.01 unlisted). These findings are in line with the predictions of all three theories, and thus can occur due to an asset diversification, lower information asymmetry between outsiders and insiders and the willingness to mitigate an overinvestment problem. The presented findings support the third hypothesis (H3). The result for the listed firms is in line with Booth et al. (2001), Pandey (2001), Frank and Goyal (2002), Drobek and Fix (2003) and Huang and Song (2006). A positive relationship between size and leverage of unlisted firms was also identified by Schoubben and Hulle (2004).

Growth opportunities have a weak positive relationship with long term debt of unlisted firms (p-value < 0.05) and total debt

Table 3. Regression results

Variables	Long-term debt		Short-term debt		Total debt	
	Listed	Unlisted	Listed	Unlisted	Listed	Unlisted
<i>Profitability</i>	-0.367^A	-0.507^A	-0.314^A	-0.394^A	-0.318^A	-0.389^A
<i>Risk</i>	-0.056^A	0.083^A	-0.066^A	0.074^A	-0.058	0.055^A
<i>Size</i>	0.231^B	0.137^A	-0.062	-0.008	0.135^B	0.122^A
<i>Growth opp.</i>	0.077	0.028^B	0.007	-0.030	0.119^B	0.026
<i>Tangibility</i>	0.369^B	0.194^A	0.316^A	0.166^B	0.357^B	0.138
Intercept	0.632^A	0.572^B	0.488^B	0.639^B	0.511^A	0.603^A
Year fe	Yes	Yes	Yes	Yes	Yes	Yes
Adj – R ²	0.301	0.388	0.535	0.377	0.261	0.279
Obs	209	193	209	230	204	230

Table 3 presents the results of the fixed effect regressions with long-term debt, short-term debt, and total debt as dependent variables. The results are estimated from Equation 1 for listed and unlisted companies. T-statistics are given in parenthesis to the right of coefficients. The superscripts A, B and C indicate statistical significance. A, B and C indicate statistical significance at 1%, 5% and 10% level respectively.

of listed firms (p-value < 0.05). These results support the predictions of the Pecking-Order Theory, but contradict to the Trade-off Theory as well as the Agency theory. A positive relationship can occur due to the inability of a growing firm to fill their financial needs with internally generated funds, thus they are looking for debt which can help to finance their ongoing projects. This result was also identified by Kester (1986) Sogorb-Mira and López-Gracia (2003), Chen (2004) and Schoubben and Hulle (2004). The findings do not support the fourth hypothesis (H4).

Tangibility has a weak to moderate positive relationship with debt of unlisted companies (p-value < 0.05) and a moderate relationship with the leverage of listed companies (p-value < 0.05). The results are in line with predictions made by the Trade-off Theory and Pecking Order Theory. Due to the lower cost of financial distress faced by companies with a high collateral value of assets, as well as the ability to issue secured debt, collateralized firms have more debt. Thus, the results support the fifth hypothesis (H5) and are consistent with studies conducted by Frank and Goyal (2002), Chen (2004), Huang and Song (2006) and Shah and Khan (2007).

6.4 The Influence of the Determinants of Capital Structure on Listed and Unlisted Firms

In order to further investigate the influence of the firm-specific determinants on the choice of capital structure, it is important to determine if, due to the nature of listed and unlisted companies, the determinants differ in their effect. Table 4 presents the results of the Chow test, which compares the strength of regression coefficients.

The Chow test has indicated that there is no difference in terms of the influence of risk and growth opportunities on the leverage of two company types. However, a significant difference in the influence of profitability on capital structure of private and public firms can be observed (p-value < 0.05). The relationship between profitability and all types of debt is stronger in the case of public firms. This finding is in line with the study of Brav (2009), who argued that due to the higher cost of accessing the external capital, public firms access the capital markets less often and acquire more cash, which implies higher sensitivity to profitability.

It is also evident from the Table 4 that there is a significant difference in the influence of size on the short-term debt of private and public firms (p-value < 0.01), although the fixed-effect regression failed to identify a relationship between the given variables. The relationship between short-term debt and size is further investigated in section 6.5.

The empirical evidence of the Chow test indicates that, the influence of tangibility on capital structure of public and private firms is significantly different (p-value < 0.01). The positive influence of tangibility is weaker for all types of debt in the case of unlisted companies. The results are in line with Goyal, Nava and Zanetti (2011), who also identified stronger influence of collateral value of assets on the leverage of listed firms. This can occur due to the fact, that private firms have a restricted access to external capital and higher costs of external financing, which implies that they have more passive financial policies than public firms (Brav, 2009). Following the line of this argument, unlisted firms are less likely to rebalance their portfolio in order to achieve the optimal capital structure proposed by the Trade-off Theory. Thus, the significant difference in the strength of the influence of tangibility of leverage of listed and unlisted firms is likely to occur due to the lower exposure of private firms to the predictions made by the Trade-off Theory.

Table 4. The differences in the influences of the determinants of capital structure on listed and unlisted firms

Variables	Long-term debt		Short-term debt		Total debt	
	F-values	P-values	F-values	P-values	F-values	P-values
<i>PROFIT</i>	4.18^B	(0.031)	3.89^B	(0.043)	4.91^B	(0.038)
<i>RISK</i>	0.17	(0.684)	0.88	(0.349)	1.69	(0.194)
<i>SIZE</i>	0.88	(0.649)	5.88^A	(0.000)	0.32	(0.571)
<i>GROWTH</i>	1.05	(0.307)	0.17	(0.679)	0.01	(0.956)
<i>TNGB</i>	5.24^A	(0.000)	7.09^A	(0.000)	2.95^A	(0.001)

Table 4 presents the results of the Chow test. F-statistics are given in the difference column and the p-values are presented the parenthesis. The superscripts A, B and C indicate statistical significance. A, B and C indicate statistical significance at 1%, 5% and 10% level respectively.

Table 5. Robustness check

Variables	Long-term debt		Short-term debt		Total debt	
	Listed	Unlisted	Listed	Unlisted	Listed	Unlisted
<i>Profitability</i>	-0.283^B	-0.415^A	-0.276^A	-0.337^B	-0.315^A	-0.397^A
<i>Risk</i>	-0.051	0.024^C	-0.071^A	0.032^A	-0.287	0.034^A
<i>Size</i>	0.145^A	0.102^A	-0.151^B	-0.070^B	0.137^A	0.096^B
<i>Growth opp.</i>	0.038	0.066^B	0.006	0.069	0.086	0.053
<i>Tangibility</i>	0.396^A	0.331^A	0.388^A	0.227^A	0.369^A	0.324^A
Intercept	0.543^A	0.175	0.472^B	0.663^A	0.612^A	0.569^A
Year fe	Yes	Yes	Yes	Yes	Yes	Yes
Industry fe	Yes	Yes	Yes	Yes	Yes	Yes
Adj – R ²	0.537	0.573	0.643	0.584	0.495	0.534
Obs	209	193	209	230	204	230

Table 5 presents the results of pooled OLS regression with long-term debt, short-term debt, and total debt as the dependent variables. The superscripts A, B and C indicate statistical significance. A, B and C indicate statistical significance at 1%, 5% and 10% level respectively.

6.5 Robustness Check

For the robustness check a pooled ordinary least square (OLS) regression models with robust standard errors was used. It was chosen due to the inability of the fixed effect regression model to account for time invariant repressors (for example industry effects). Enlarged standard error terms are used since the variables are nested in companies which can present a potential threat to the “independence of residual assumption”, thus presents a threat of heteroscedasticity (Tomarken and Waller, 2005).

The results of the pooled OLS, including year and industry dummies, are presented in Table 5. After it has been controlled for the industry effects the independent variables explain around 53-57 per cent of the variance in the long-term debt, 58-64 per cent of the changes in short-term debt and 50-53 per cent in the case of total debt. Thus, the explanatory power of the models is increased compared to the fixed-effect regressions.

The results for profitability, risk, growth opportunities and tangibility are mostly the same. However, size has a weak negative relationship with the short-term debt, irrespective of the company type. This results support the argument made by Titman and Wessels (1988), that smaller firms are more levered than large firms. They prefer to use short-term leverage, due to the higher cost of issuing equity for small firms (Smith, 1977) and lower fixed cost associated with this source of funds.

From Table 3 it can be observed, that there is a significant difference in the influences of size on debt of listed and unlisted firms. Short-term debt of private firms is less sensitive to size. This result is likely to occur due to the higher cost of issuing external capital faced by the unlisted companies (Brav, 2009) and as was previously discussed lower sensitivity of unlisted firms to factors commonly associated with the Trade-off Theory, such as size and tangibility.

7. CONCLUSION

The aim of this study was to analyze the capital structure antecedents of listed and unlisted firms and to identify if the influences of these factors are consistent. In this study the main firm characteristics, that according to academia, are important determinants of the capital structure have been analyzed. Furthermore, the impact of a stock listing on the usage of leverage of Dutch firms was investigated.

Based on the results of an econometric analysis the following determinants are important for listed and unlisted Dutch companies: profitability, earnings volatility, size, growth opportunities, and tangibility. Profitability has a negative influence on all types of leverage. This is likely the case because of the high retained earnings, accumulated by profitable firms, which gives them the ability to avoid external financing and its associated additional costs. The relationship between profitability and all types of debt is stronger in the case of public firms.

Earnings volatility of listed firms decreases their debt levels. A negative relationship can occur due to an increased income variability as well as an increased probability of financial distress, or increased information asymmetry and a higher demanded risk premium for debt. Unlisted firms experience the opposite influence: risk has a positive influence on debt, because of the relative cost increase of equity, which comes with earnings volatility.

The size of listed firms has a positive influence on total as well as long-term leverage, which means that larger firms are likely to have more debt. This relationship is predicted by all three theories; thus it is hard to identify the actual theoretical reason behind it. A possible explanation of this relationship is the

combination of the following factors: a higher diversification and lower risk of bankruptcy; lower information asymmetry and decreased direct cost of debt; or disciplining effect of leverage. However, there is a negative relationship between size and short-term debt, which is likely to occur due to the higher cost of issuing equity for small firms and lower fixed cost associated with short-term leverage. Size, as a standard factor, associated with the Trade-off Theory has less influence on the capital structure of unlisted firms.

Growth opportunities have a positive relationship with long-term leverage of unlisted firms and total debt of listed companies. This relationship exists due to the increase in the financial needs of a growing company and inability to cover them with internally generated funds.

Tangibility, as a measure of the collateral value of assets, has a positive influence on the proportion of all types of debt, irrespective of the type of firm. This relationship can be explained by the lower cost of financial distress, which companies with high collateral value of assets face, as well as their ability to issue secured debt. The influence of tangibility on the debt level is weaker in the case of unlisted firms, because of the lower exposure of private firms to the predictions made by the Trade-off Theory.

In overall the results for listed and unlisted firms are fairly similar and give a support to the Pecking Order Theory proposed by Myers and Majluf (1984).

This study contributes to the existing literature by providing additional knowledge about the determinants of capital structure. There is no established previous research that has investigated the differences in the effects of the determinants on the leverage of public and private Dutch firms.

The findings presented in this research are useful for making a choice between debt and equity. The main practical value of this research is, that it provides an indication of important factors that must be taken into account when a decision about a capital structure of Dutch firms is being made.

An important limitation of static capital structure models, as the one presented in this study, is their inability to capture the adjustment process in leverage ratios. The study of DeAngelo et al. (2011) presents a dynamic capital structure model, which takes leverage dynamics into account. A possibility for a future research is to investigate whether the adjustment process differs between listed and unlisted firms. Such an approach could further clarify the influence of a stock listing on capital structure.

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APPENDIX 1

Table 6. Overview of studies on the determinants of capital structure

Author(s), year	Sample	Study design	Dependent variable	Independent variables and obtained results	
Kester, (1986)	Manufacturing publicly traded Japanese (344) and U.S. (452) companies	OLS regression Dummy for industry, country	Gross, net, adjusted debt-equity ratios	Growth opp. (+) Profitability (-) Industry	Risk (-) Size (-)
Titman and Wessels, (1988)	469 U.S manufacturing firms (1974-1982)	Factor-analytic technique	LTD; STD; convertible debt (book values)	Tangibility Growth opp. Size (-) Profitability (-)	Non debt tax shield Uniqueness (-) Risk Industry
Barclay, Marx and Smith, (1995)	5,953 industrial firms (1974 – 1995)	Reduced-form OLS regressions; Two-stage-least squares regressions	TD; debt-maturity	Tangibility (+) Net operation loss (+) Marginal tax rate	Profitability (-) Size
Rajan and Zingales, (1995)	Non-financial publicly traded G-7 companies (1987-1991)	The regression is estimated using maximum likelihood and a censored Tobit model.	TD, total liabilities (book value)	Tangibility (+) Growth opp. (-)	Profitability (-) Size (+)
Booth, Aivazian, Demircuc-Kunt (2001)	Large publicly traded firms of developing countries (1980-1990)	Pooled OLS, Fixed effect regressions	TD, LTD (book) LTD (market)	Tax rate Growth opp. Risk (-)	Tangibility (-) Size (+) Profitability (-)
Pandey, (2001)	106 publicly traded Malaysian companies (1984-1990)	Pooled OLS, Fixed effect regressions	STD, LTD TD	Growth opp. Size (+) Risk (LTD-; STD+) Non-debt tax shields (-)	Tangibility (-) Profitability (-) Risk (-)
Fama and French, (2002)	3000 publicly traded US firms (1965 – 1999)	Two-step cross-section regression	TD (book), TD (market)	Profitability (-) Non-debt tax shields (-) Growth opp. (-)	Size (+) Risk (-)
Frank and Goyal, (2002)	768 publicly traded US firms (1971 - 1998)	Fixed effect regressions	LTD, TD, Equity	Tangibility (+) Growth opp. (-)	Size (+) Profitability (-)
Drobez and Fix (2003)	124 non-financial publicly traded Swiss (1997 – 2001)	Pooled OLS, Fixed effect regressions, Dynamic panel estimators	Total liabilities, TD, LTD (book)	Growth opp. Tangibility (-)	Size (+) Risk (-)
Sogorb-Mira and López-Gracia(2003)	6482 Spanish SMEs (1994-1998)	Pooled OLS, 2S2, GMM regressions	TD (book)	Tax rate (+) Liquidity Tangibility Non-debt tax shield (-)	Risk Profitability Size (+) Growth opp. (+)
Chen (2004)	88 Chinese-listed companies (1995-2000)	Pooled OLS, Fixed effect regressions	TD, LTD (book)	Financial distress cost (-) Tangibility (+) Non-debt tax shield (-)	Profitability (-) Size (+) Growth opp. (+)
Schoubben, and Hulle (2004)	119 listed and 388 unlisted Belgian firms (1992-2002)	Maximum likelihood regression	TD, STD	Profitability (-) Non-debt tax shield Growth opportunities (+)	Tangibility (+) Size (+) Risk (-)
Leary and Roberts (2005)	3,494 publicly traded US firms (1984-2001)	Fixed effect regressions	TD (book), TD (market), Equity	Profitability (-) Risk Tangibility (-)	Equity return Size (-) Selling expenses
Huang and Song (2006)	1000 publicly traded Chinese companies (1994-2000)	OLS regression; Tobit model	LTD, TD , total liabilities (book and market values)	Growth opp. Tangibility (+) Non-debt tax shield (+) Ownership structure	Profitability (-) Size (+) Tax rate Risk (+)

Table 6. Continued

Shah and Khan (2007)	286 non-financial publicly traded companies from Pakistan	Fixed effect regression	TD, LTD, STD	Size Growth opp. (-) Tangibility (+)	Profitability (-) Risk
Akhtar and Oliver, (2009)	360 publicly traded Japanese companies (1994-2003)	Pooled OLS regression with dichotomous interaction variables	LTD (market value)	Bankruptcy risk (-) Agency costs (-) Size (+) Profitability (-) Foreign exchange risk (-) Tangibility (+) Growth opp. (-) Tangibility (+)	Age (+) Political risk Risk (-) Growth opp. Non-debt tax shield Free cash flow Liquidity Size
Degryse, Goeij, Kaoort et al. (2012)	30000 Dutch SMEs (2003-2005)	Pooled OLS, Fixed effect regressions	TD, LTD, STD	Size (+) Profitability (-) Tax rate	Tangibility (+) Growth opp. (-) Depreciation
Cole (2013)	4000 privately held US firms (1987-2003)	Weighted-least-squares regression model	Total loans, total liabilities (book value)	Industry leverage (+) Creditworthiness (+) Growth opp. (-) Tangibility (+)	Profitability (-) Age (-) Liquidity Size

This table presents a summary literature review on the determinants of capital structure. Authors, years of the study, samples, research designs, as well as dependent variables (relevant for the given study), independent variables and identified results are included in the table.