

Determinants of the capital structure of Dutch SMEs

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ABSTRACT

This study explores the important firm-level factors determining the capital structure of Dutch SMEs. Data, containing financial statements of Dutch SMEs in the period 2010-2012, was collected from the database Reach. I analyzed 5235 firm-year observations. Using the Ordinary Least Squares regression analysis factors of the trade-off theory and the pecking order theory have been tested. The empirical results show that the capital structure of Dutch SMEs is mainly influenced by the firm-level factors 'Non-debt tax shields', 'Profitability' and 'Liquidity' and that the pecking order theory has the most explanatory power for the capital structure of Dutch SMEs.

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Keywords

Capital structure, Dutch small and medium-sized enterprises, firm-level determinants, leverage ratio, pecking order theory, trade-off theory

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1. INTRODUCTION

Since the paper of Modigliani and Miller (1958) which state the irrelevance of the capital structure for the firm value, also known as the MM-theory, the optimal capital structure of firms is researched extensively. One of the theories which descended from the MM-theory is the trade-off theory in which a decision maker assesses the costs and benefits of different financing options. This theory argues that a firm decides between financing options by setting off the potential tax benefits of debt against the potential bankruptcy costs (Bradley, Jarrell and Han Kim, 1984; DeAngelo and Masulis, 1980). Another theory, the pecking order theory, is based on the statement of information asymmetry. According to Myers (1984) firms prefer financing with a low degree of asymmetric information over financing with a high degree of asymmetric information because the costs of financing increase when capital is obtained from outside creditors who don't have complete borrower information. The agency costs theory completes the row of most important capital structure theories. This theory is about agency costs which have their effect on the capital structure choices firms make (Jensen and Meckling, 1976). Agency costs result from conflicts of interest between (1) shareholders and managers and between (2) shareholders and creditors. Other theories about the capital structure of firms are the signalling theory, market timing theory, flexibility theory and the life cycle theory.

The capital structure of firms can be determined by country-level, industry-level and firm-level determinants. This paper aims to focus on the firm-level determinants of the capital structure of Dutch firms. While many studies focus on the capital structure of large stock-listed firms this study investigates the capital structure of unlisted Dutch small and medium-sized enterprises (SMEs). Several empirical studies (Bates, 1971; Titman and Wessels, 1988; Ang, 1991; Petersen and Rajan, 1994) suggest the presence of differences in the capital structure of SMEs and large firms and that the leverage ratio is a function of several firm characteristics. The scientific relevance of this study is that it examines the capital structure of Dutch SMEs with the use of recent data in contrast to other

studies. The practical relevance of this paper is that the outcome could help the Dutch government in aligning policies with firms' financing aspirations and the outcome could help also Dutch entrepreneurs of SMEs in understanding the principles of their capital structure.

The definition of a SME used in this paper is the definition of the European Commission which took effect on 1/1/2005 among the Member States of the European Union: *'the category of micro, small and medium-sized enterprises ... is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro.* SMEs are important for economies of developed countries because they are the generators of income and employment and are drivers of innovation and growth (OECD, 2009). In The Netherlands the SMEs contributed 50% tot the total GDP in 2007 and 58.5% of the employed people in The Netherlands were employed in an SME (Ayyagari, Beck and Demirguc-Kunt, 2007). Because of the focus on firm-level determinants and on Dutch firms, especially SMEs, the research question for this study will be: ***Which firm-level factors determine the capital structure of Dutch small and medium-sized enterprises?*** This research question will be answered with an investigation of data of Dutch SMEs from 3 years; 2009 until 2011 for the independent variables, 2010 until 2012 for the dependent variable. The year 2013 is not taken into account because of missing firm-specific data for some companies. The data is going to be collected via the database Reach. The method of statistical testing the data will be the Ordinary Least Square Regression method which is suitable for this type of studies as other, comparable, studies show (Chen, Lensink and Sterken, 1999; Degryse, Goeij and Kappert, 2010).

This study will focus on the trade-off theory (TOT) and the pecking order theory (POT) in explaining capital structure choices of Dutch SMEs because, as Table 1 and Table 2 show, these two theories are used in most studies explaining the capital structure. Table 1 shows studies investigating the capital

Table 1: Studies investigating the capital structure of SMEs

Authors	Michaelas, Chittenden and Poutziouris, (1998)	Heshmati, (2001)	Sogorb-Mira and López-Gracia, (2003)	Cassar and Holmes, (2003)	Bhaird and Lucey, (2008)
Theories used	TOT, POT, Agency costs theory	TOT, POT, Agency costs theory	TOT, POT	TOT, POT	POT, Agency costs theory
Country under investigation	United kingdom	Sweden	Spain	Australia	Ireland

Table 2: Studies investigating the capital structure of Dutch firms (SMEs and non-SMEs)

Authors	Chen, Lensink and Sterken, (1999)	Chen and Jiang, (2001)	Haan and Hinloopen, (2003)	Bie and Haan, (2007)	Degryse, Goeij and Kappert, (2010)
Theories used	TOT, Agency costs theory	TOT, POT	TOT, POT	TOT, POT, Market timing theory	TOT, POT
					(this study is about capital structures of Dutch SMEs in the period 2003-2005)

structure of SMEs of different countries whereas Table 2 (Appendix A) shows studies which investigate the capital structure of Dutch firms, so SMEs and larger firms. The choice to focus only on 2 theories instead of more theories is in line with the paper of Shyam-Sunder and Myers (1999) which state that, to empirically explain firm leverage better, it's necessary to conduct an in-depth study of two theories rather than try to study all available theories.

The following section of this paper is the Literature review in which the key literature about capital structure, trade-off theory and pecking order theory is described. Because these theories don't make a distinction between the capital structure of large and small + medium-sized firms (Ang, 1991) it's tried to apply the theory to the case of SMEs so that testable hypotheses can be formulated. In the Methodology-part the methods of testing are described. Subsequently the hypotheses are statistically tested and discussed in the Results and in the Conclusion the main findings of this research are pointed out.

2. LITERATURE REVIEW

2.1 Modigliani and Miller

The way in which firms are financed through a combination of debt and equity, the capital structure, is studied extensively since the paper of Modigliani and Miller (1958). The theory about the capital structures of firms roughly starts with that paper in which the irrelevance of the capital structure in a perfect market is stated. According to Modigliani and Miller (1958) it doesn't matter whether companies finance themselves with debt or equity because this doesn't change the firm value in the situation of a perfect market. In a perfect market there aren't agency costs, taxes, financial distress costs and bankruptcy costs. However, because these costs are present in real life, the capital structure of a firm has an effect on the firm value. Therefore, after the theory of Modigliani and Miller, the MM-theory, researchers started to study effects of market imperfections on capital structure and the firm-level determinants of capital structure resulting in several theories. Two important theories are the trade-off theory and the pecking order theory (Myers, 1984) which will now be discussed.

2.2 Trade-off theory

The trade-off theory argues that a firm's optimal leverage ratio is determined by trading off the costs and benefits of borrowing, while the firm's assets and investments being held constant (Myers, 1984; Kraus and Litzenberger 1973). A firm chooses the amount of debt and equity financing by evaluating the costs and benefits of debt. Benefits of borrowing are the tax shields in which interest payments are deductible from income tax payments. However when non-debt tax shields are present the benefits of borrowing are reduced (DeAngelo and Masulis, 1980). Costs of borrowing are the possible costs of financial distress and bankruptcy costs. When a firm has an optimal capital structure then the benefits and costs of debt offset each other and a balance is accomplished. To test the trade-off theory the advantages and disadvantages of debt financing are discussed below after which hypotheses are stated.

The benefit of debt is that it could shield income from taxes (Modigliani and Miller, 1963), because the interest paid on debt can be deducted from the taxes paid on earnings. Tax policies have a considerable effect on the capital structures of firms. The tax advantage of debt would lead firms to completely finance themselves through debt because interest payments are deductible while equity-related payments aren't tax deductible (Modigliani and Miller, 1963). However DeAngelo and Masulis

(1980) state that some tax shields, the non-debt tax shields like for example depreciation and R&D costs, substitute the benefit of debt. Besides the non-debt tax shields there are costs that offset the benefit of debt.

Costs of debt financing could be the financial distress costs which are incurred when the business is viewed as almost bankrupt. In that situation customers may be moving to competitors, suppliers are less willingly to give trade credit and employees may be less disciplined in working for the firm. Another cost of debt, bankruptcy costs, comes apparent when the chance of failing to pay back financing or interest is greater than zero (Cassar and Holmes, 2003). Debt creditors can have the need of monitoring the managers' behaviour which indirectly increases the costs for the firm. The bankruptcy costs and financial distress costs are forces that push the firm to take a lower level of debt financing because these costs reduce the value of the firm.

To determine if the capital structure of Dutch SMEs is in line with the trade-off theory some hypotheses have to be stated. Myers and Majluf (1984) state that the bigger a firm is, the lower the information asymmetry, i.e. the more information outsiders have about the firm. Therefore, because information asymmetry is an obstacle for firms to borrow money, larger firms can get loans easier than smaller firms. Besides that the information costs of large firms are lower than that of small firms because their financial information tends to be more accurate and transparent than that of small firms. According to the Observatory of European SMEs (2003/2002) insufficient company information is the main reason of banks to don't finance that company which leads to larger firms having higher leverage ratios than smaller firms. Sogorb-Mira and López-Gracia (2003) use firm size as variable in their study investigating the capital structure of Spanish SMEs. This all implicates that larger SMEs are leveraged more than smaller firms (Ang, 1991) which leads to the first hypothesis;

H1: Firm size will be positively related to the leverage ratio

Cassar and Holmes (2003) mention the costs of potential bankruptcy which can come apparent when a firm can't pay its interest or pay back its debt and apply this in analyzing SMEs in Australia. Lenders incorporate the higher potential of bankruptcy of the company in the interest rates they ask. As a result the company faces higher financing costs. Potential bankruptcy costs therefore are incentive for the firm to finance with debt as minimum as possible. If the risk of going bankrupt, the business risk, is higher, than the interest paid on debt would be higher and as a consequence the company would leverage itself as minimum as possible. The hypothesis following this reasoning is;

H2: Business risk will be negatively related to the leverage ratio

The interest payments on debt can be deducted from tax (Modigliani and Miller, 1963). Thus using debt financing has a big advantage; it reduces the income tax that has to be paid (DeAngelo and Masulis, 1980). Therefore the higher the effective tax rate, the higher the incentive for a company to finance with debt and thus the higher the leverage ratio (Hillier, Clacher, Ross, Westerfield, Jaffe and Jordan, 2011). The third hypothesis in line with this reasoning is;

H3: Effective tax rate will be positively related to the leverage ratio

However, the presence of non-debt tax shields, as discussed above, substitute the benefits of debt (DeAngelo and Masulis, 1980; Titman and Wessels, 1998). Non-debt tax shields, as for example R&D costs and depreciations, also shields income

from taxes as tax shields do. When the non-debt tax shields are present in a company the company relatively can take less advantage of tax shields and that lowers the tendency to finance with debt, and this holds also for SMEs (Sogorb-Mira and López-Gracia, 2003). According to Chen and Jiang (2001) the non-debt tax shields are very important in the capital structure choice of Dutch firms in general. That's why the fourth hypothesis is;

H4: Non-debt tax shields will be negatively related to the leverage ratio

According to the trade-off theory a profitable firm, which therefore has higher tax rates than a less profitable firm, is expected to have a higher level of debt financing to offset taxes (Fama and French, 2002). As argued, tax shields are a trigger for firms to finance with debt because paid interest can partially shield income from taxes. Petit and Singer (1985) state the expectation that the less profitable companies are, the less these companies can take advantage of tax shields whereas more profitable companies can take more advantage of tax shields. So the more profitable a company is, the more advantage it can take from having debt. Therefore the last hypothesis testing the trade-off theory is;

H5: Profitability will be positively related to the leverage ratio

2.3 Pecking order theory

The pecking order theory, which was developed by Myers (1984) and Myers and Majluf (1984), states that firms prefer internal equity to external debt. When a firm needs financial resources it can choose between internal financing and external financing. According to the pecking order theory firms prefer internal financing to external financing because of the information asymmetry about the firm value between the management of the firm and the outside investors. Therefore when a firm searches for financial resources the internal financial resources, such as cash reserves, are exhausted first. Only when the internal financial resources are exploited a firm searches for external financing. In case of external financing firms prefer debt financing to external equity like share issues (Jong, Kabir and Nguyen, 2008). This is because debt investors are less interested in the value of the firm than shareholders because in case of a firms' bankruptcy the debt investors get back their money sooner than shareholders. Managers of a firm want to share as less information as possible and therefore prefer internal finance to external finance, and prefer debt before external equity (Myers, 2001).

Literature shows that the pecking order theory is relevant especially for SMEs because SMEs face relatively greater information asymmetries and relatively higher costs of external equity (Ibbotson et al., 2001; Chittenden, Hall and Hutchinson, 1996). According to Chittenden et al. (1996) owners of SMEs have a tendency to retain full control of the SME and therefore use their own savings and earnings first. When their own financial resources aren't sufficient they use short-term debt and subsequently long-term debt. Only when it is insurmountable the owners of SMEs issue shares.

A possible determinant to reveal the presence of the pecking order theory in the capital structures of Dutch SMEs is 'liquidity', which is the ability of current assets of a company to meet current liabilities when due. Ozkan (2001) states that the liquidity of a firm affects the leverage ratio and his results show that this relation is negative. His outcome is in line with the pecking order theory because when a firm is more liquid, i.e. has more internal funds, it will prefer these internal funds to external funds in financing. Several other studies, studying

firms in general, use liquidity to test the pecking order theory (Eriotis, Vasiliou and Ventoura-Neokosmide, 2007; De Jong et al., 2008) and expect a negative relationship between liquidity and the leverage ratio also. Voulgaris, Asteriou and Agiomirgianakis (2004) conclude in their study that liquidity does not affect large-sized enterprises, but does affect small and medium-sized enterprises. Because liquid firms tend to have more internal financial resources and therefore are less likely to use external financial resources such as debt the sixth hypothesis is;

H6: Liquidity will be negatively related to the leverage ratio

Because the importance of the retained funds for the pecking order theory it can be stated that the age of the firm has a negative effect on the amount of leverage of a firm. The argumentation behind this is that older firms can relatively more easily retain profits than younger firms (Berger and Udell, 1998; Weston and Brigham, 1981). Petersen and Rajan (1994) show that the amount of debt financing of a firm decreases with the age of the firm. As stated this can be explained by the fact that young firms are forced to finance with debt because they haven't retained funds already, while older firms can accumulate retained funds and thus tend to borrow less (Hall et al., 2004). Therefore the seventh hypothesis is;

H7: Age will be negatively related to the leverage ratio

The determinant 'profitability' which is used already in a hypothesis following the trade-off theory can also be used in the pecking order theory to analyse the capital structures of SMEs. Following the pecking order theory firms have preference for internal financing over external financing. Therefore profitable firms, which have retained profits, can use these for financing and so have no need for external funds. So the expectation, in line with the pecking order theory is; the more profitable the firm is, the less likely is the need of that firm to borrow. Several studies investigating the capital structure of SMEs show empirical evidence for this negative relation between profitability and debt financing (Chittenden et al., 1996; Jordan et al., 1998; Michaelas et al., 1999). As a result the eighth hypothesis is;

H8: Profitability will be negatively related to the leverage ratio

In the next chapter, the Methodology-part, the method of testing the hypotheses and the proxies for the possible determinants are presented.

3. METHODOLOGY

3.1 RESEARCH METHOD

To empirically examine the relationship between the variables in this study three different analyses are done in the Results part. First a Univariate analysis is done by analysing the descriptive statistics. Thereafter a Bivariate analysis is carried out which will show the correlations between the firm-level determinants and the leverage ratio and the correlations between the independent variables. Finally a Multivariate analysis is done by using the Ordinary Least Squares method to analyse which theory, the pecking order theory or the trade-off theory, dominates the capital structure of Dutch SMEs. The Ordinary Least Squares method describes a relationship between an independent variable and a dependent variable with a line, the line of best fit. The method fits a straight line in which the vertical distance to the different observed data-points is minimised. According to Allison (1998) the usefulness of the OLS-method lies in the fact that this method measures the degree of influence of the independent variables on the dependent variable, the leverage ratio. The 'degree of influence'

can be seen back in the coefficients of the independent variables. Comparable studies also use the OLS-method in analysing the capital structure of SMEs (Bhaird and Lucey, 2010; Cassar and Holmes, 2003; Degryse et al., 2009; Heshmati, 2001; etc.).

In this study the influence of the independent variables (determinants) on the dependent variable (leverage ratio) is investigated. It is possible that the dependent variable causes the independent variables. To tackle this possible reverse causality the data of the independent variables is lagged one year behind the dependent variable (Deesomsak et al., 2004) which gives a more robust test of the theory.

Therefore following model is used in this study:

$$LR_{it} = \beta_0 + \beta_1 FS_{it-1} + \beta_2 BR_{it-1} + \beta_3 ETR_{it-1} + \beta_4 NDTS_{it-1} + \beta_5 P_{it-1} + \beta_6 L_{it-1} + \beta_7 A_{it-1} + \varepsilon_{it}$$

Where:

- LR_{it} = the leverage ratio of SME i at time t ,
- FS_{it-1} = the firm size of SME i at time $t-1$,
- BR_{it-1} = the business risk of SME i at time $t-1$,
- ETR_{it-1} = the effective tax rate of SME i at time $t-1$,
- $NDTS_{it-1}$ = the non-debt tax shields of SME i at time $t-1$,
- P_{it-1} = the profitability of SME i at time $t-1$,
- L_{it-1} = the liquidity of SME i at time $t-1$,
- A_{it-1} = the age of SME i at time $t-1$,
- ε_{it} = the error term.

Above regression model is derived on the basis of other studies such as Titman and Wessels (1988) and Deesomsak et al. (2004). Although they include some other independent variables the regression model is largely the same as in current study.

Although some researchers include the control variable 'Industry' in their research (Degryse et al. 2004; Sogorb-Mira and López-Gracia, 2003) that control variable is not included in this research. Balakrishnan and Fox (1993) argue that industry factors are not nearly as important as firm specific factors in explaining capital structure. Jordan et al. (1998) quoted Harris and Raviv (1991) who state that firms within an industry have more in common with each other than firms of different industries, and that there is a strong difference in the debt ratios of the industries over time. However, Jordan et al. (1998) state, because SMEs often operate in niche markets, that the impact of industry influences on capital structure is reduced. Their hypothesis was supported by their findings. Myers (1984) also states that differences in capital structure are likely to be due to firm-level factors rather than industry differences. Because of these arguments the control variable 'Industry' isn't included in the current study.

3.2 Variables

In this study the effects of the firm-level determinants on the leverage ratio are analyzed. The dependent variable leverage ratio, the proportion of debt financing, is calculated as: $(total\ debt) / (total\ assets)$. The focus on only the total debt ratio is in accordance with the papers from Rajan and Zingales (1995) and Deesomsak et al. (2004). However Wald (1999) investigated both the long-term debt ratio and total debt ratio but found similar results for both proxies which gives that the measure in current study is sufficient and reliable.

Proxies for the firm-level determinants are taken from researchers who already tried to explain capital structures of firms in different countries and their accordance with the trade-off theory and pecking order theory. The determinant firm size can be identified by: *the natural logarithm of total assets* (Titman and Wessels, 1988; Sogorb-Mira, 2005; Fama and French, 2002; Degryse et al., 2010). The natural logarithm is used to rescale the data and get a more symmetric distribution. The business risk, the risk of the company facing financial distress or going bankrupt and as a consequence not being able to pay back, can be calculated as: $(the\ annual\ percentage\ change\ in\ earnings\ before\ interest\ and\ taxes\ (EBIT)) - (the\ average\ of\ this\ change\ in\ EBIT\ over\ the\ sample\ period)$ (Deesomsak et al., 2004). Kim and Sorensen (1986) calculate the effective tax rate as: $(tax\ paid) / (earnings\ before\ taxes,\ EBT)$. This measure for the effective tax rate is also used by Ozkan (2000) and Sogorb-Mira (2005). According to Bradley et al. (1984) the depreciation costs can be used to determine the non-debt tax shields, so this determinant can be calculated as: $(depreciation\ costs) / (total\ assets)$ (Titman and Wessels, 1988; Sogorb-Mira and López-Gracia, 2003; Degryse et al., 2010). The profitability of a SME can be calculated as: $(EBIT) / (total\ assets)$ (Michaelas et al., 1999; Fama and French, 2002; Sogorb-Mira and López-Gracia, 2005). The determinant liquidity can, according to De Jong et al. (2008), Deesomsak et al. (2004) and Sogorb-Mira and López-Gracia (2008), be calculated as: $(total\ current\ assets) / (total\ current\ liabilities)$. Finally the determinant age can be determined as: *the age of the firm in years since the year of incorporation* (Michaelas et al., 1999; Hall et al., 2004).

3.3 Data

To answer the research question data is gathered and analysed. This research project focuses on the leverage ratio of Dutch SMEs in the period 2010-2012 and, because of the lagging of the independent variables, data has to be gathered from 2009 until 2012. The leverage ratios of 2010 have to be linked to the observations on the independent variables of 2009, leverage ratios of 2011 to independent variables of 2010 and leverage ratios of 2012 to independent variables of 2011. The data is collected from the database 'Reach' which contains detailed information about 430.000 Dutch firms and which is specialized for small and medium-sized companies. Companies within the database Reach are selected that correspond with the definition of SMEs of the European Commission which took effect on 1/1/2005 among the Member States of the European Union. Companies are selected that employ less than 250 employees, and have a balance sheet total not exceeding €43.000.000 and/or annual sales not exceeding €50.000.000. The financial institutions are removed out of the dataset because these companies often face regulations regarding capital requirements and therefore have a strong deviating capital structure comparable to other companies. The governmental companies are also removed out of the dataset because these companies are often subsidized by government and therefore their capital structure is already deviating. When SMEs lack data in a specific year they are removed for that year. Besides that some outliers have been replaced so that they provide a better normal distribution and don't bias the outcome of this study. This outlier replacement is done through winsorising all variables at the one percent level (Tukey, 1962). This method is also used by Bevan and Danbolt (2002) who studied the capital structure of firms in the UK. This gives a dataset to analyze with 5235 firm-year observations (in the period 2010-2012; independent variables are already linked to the leverage ratio of corresponding next year) of small and medium-sized companies with office in the Netherlands. The sample consists of 1847

different SMEs of which 75 SMEs provide 1 firm-year observation, 156 SMEs provide 2 firm-year observations and 1616 SMEs provide 3 firm-year observations. Further there are 1759 firm-year observations in 2010, 1754 firm-year observations in 2011 and 1722 firm-year observations in 2012. In section 3.4 the descriptive statistics of the sample are presented and compared to other studies.

3.4 Descriptive statistics

Table 3 gives an overview of the statistics of the sample of Dutch SMEs with 5235 firm-year observations used in this study. The independent and dependent variables are given in the first column where after the formula of calculating each variable is given. Further the mean, median, standard deviation, minimum and maximum of the variables are presented.

The results of the descriptive statistics are compared with other papers investigating the capital structure of SMEs, although these papers often analyse another period or have used other proxies. Papers with which is going to be compared is the paper from Hall et al. (2004) who analyse Dutch SMEs among SMEs from other countries in 1995 and the paper from Degryse et al. (2010) who analyse Dutch SMEs in the period 2003-2005.

The leverage ratio of Dutch SMEs during the period 2010-2012 is, on average, 60.0% which seems to be around 10 percentage points higher than observed by Hall et al. (2004) and Degryse et al. (2010). It shows that the SMEs in current sample hold more debt, or the value of the total assets is decreased. The difference in leverage ratio could be attributed to the different (most recent) time period of data used in the current study.

When comparing the determinants of the capital structure of Dutch SMEs it can be said that the mean of firm size, which is measured as the natural logarithm of total assets, of the sample used in this study is higher (15.94 > 6.05) than the mean observed in the study of Degryse et al. (2010), which can be attributed to the fact that their study contains more small firms because they used a dataset from Rabobank. Because submitting financial data is not obliged by law the database Reach contains relatively less small firms than the dataset from Rabobank who collects financial information of all their clients.

That's why a higher mean of firm size is observed in the current study compared to the study of Degryse et al. (2010). The descriptive statistics of the determinant business risk cannot be compared to studies investigating the capital structure of SMEs because they don't include this determinant in their analysis or use another measure. Deesomsak et al. (2004) did use this measure but studied firms in the Asian Pacific region and found means between 2.37 and 4.09. Because of their focus on another region and on firms in general it's difficult to compare the means of the business risk. The mean of the business risk in current study is 0.58. This positive mean shows that, on average, the annual percentage change in EBIT of a Dutch SME is bigger than the average percentage change in EBIT of a Dutch SME. The mean of the effective tax rate in this study is higher than that in the study of Degryse et al. (2010) which indicates that SMEs in current sample pay more tax with regards to the EBT. The mean of non-debt tax shields is lower than observed in the study of Degryse et al. (2010) which could be attributed to their focus on the small firms within SMEs. The mean of the determinant profitability is comparable to the mean in the study of Degryse et al. (2010), although the profitability of the SMEs in the study of Hall et al. (2004) is 3 percentage points higher. For the determinant liquidity no research has been done before among Dutch SMEs. De Jong et al. (2008) did use this variable in their investigation of capital structure of firms and found for Dutch firms in general a mean of 2.58 which is a half percentage point higher than in current study (1.99). The age of the firms is analysed in the study of Hall et al. (2004) in which they come to a mean of 23 years while in this study the mean age of Dutch SMEs is 38 years. Overall, comparing the descriptive statistics of the sample with other studies, can be said that the descriptive statistics are slightly deviating which could be attributable to different factors. First the period which is used in this study is different from the other studies; the current study used most recent data. Further the sample of Degryse et al. (2010) contains relatively more small firms than this study which inevitable leads to other descriptive statistics. Some reasonable important determinants used in this study, especially the variable 'Liquidity', can't be compared to other studies investigating the capital structure of (Dutch) SMEs which again shows the relevance of current study.

Variable	Measurement	Mean	Median	SD	Min	Max
Leverage ratio	(total debt) / (total assets)	0.60	0.62	0.21	0.10	1.03
Firm size	natural logarithm of total assets	15.94	15.92	0.55	14.42	17.48
Business risk	(annual % change in EBIT) - (average % change in EBIT)	0.77	-0.09	120.22	-373.00	352.71
Effective tax rate	(tax paid) / (EBT)	0.23	0.24	0.11	-0.33	0.71
Non-debt tax shields	(depreciation costs) / (total assets)	0.04	0.03	0.04	0.00	0.20
Profitability	(EBIT) / (total assets)	0.11	0.09	0.13	-0.24	0.53
Liquidity	(total current assets) / (total current liabilities)	1.99	1.56	1.42	0.47	9.34
Age	age since date of incorporation (in years)	37.54	31.00	27.03	4	126

This table reports the means, medians, standard deviations, minimums and maximums of the independent variables of the sample of Dutch SMEs in the period 2009-2011 and the mean, median, standard deviation, minimum and maximum of the dependent variable 'Leverage ratio' of Dutch SMEs in the period 2010-2012. N = 5235 firm-year observations.

4. RESULTS

4.1 Results bivariate analysis

Table 4 shows the outcome of the bivariate analysis. With this information can be observed whether the firm-level determinants are correlated with the leverage ratio. The results show that the 'Firm size' is correlated significantly with 'Leverage ratio' (correlation = -0.14; $P < 0.01$) although this correlation is negative in contrast to hypothesis H1 in which was stated that the larger the firm the more leveraged it is. The variable 'Non-debt tax shields' is significantly correlated with 'Leverage ratio' (correlation = 0.07; $P < 0.01$), although this correlation is positive in contrast to hypothesis H4 in which was expected that the more non-debt tax shields a company has, the less use for tax shields that company has. Further are the variables 'Profitability' (correlation = -0.20; $P < 0.01$), 'Liquidity' (correlation = -0.61; $P < 0.01$) and 'Age' (correlation = -0.04; $P < 0.05$) all three are significantly correlated with 'Leverage ratio'. The correlations with the leverage ratio of these three are all negative which is consistent with the corresponding hypotheses of the pecking order theory; H6, H7 and H8.

Among the independent variables there are variables that correlate also. From Table 4 can be seen that the determinant 'Firm size' is correlated significantly with 'Non-debt tax shields' (correlation = -0.11; $P < 0.01$), 'Profitability' (correlation = -0.04; $P < 0.01$), 'Liquidity' (correlation = 0.12; $P < 0.01$) and 'Age' (correlation = -0.03; $P < 0.05$). Further there is a significant correlation between 'Profitability' and 'Business risk' (correlation = 0.15; $P < 0.01$), 'Effective tax rate' (correlation = 0.07; $P < 0.01$), 'Non-debt tax shields' (correlation = -0.09; $P < 0.01$), 'Liquidity' (correlation = 0.11; $P < 0.01$), and 'Age' (correlation = -0.05; $P < 0.01$). Lastly there exists significant correlation between 'Non-debt tax shields' and 'Liquidity' (correlation = -0.19; $P < 0.01$) and between 'Non-debt tax shields' and 'Age' (correlation = 0.04; $P < 0.05$). Because the correlation coefficients between the independent variables are all smaller than 0.7 there wouldn't be a multicollinearity problem (Huizingh, 2006). Next to that the VIF-values have been calculated to detect multicollinearity. However, the VIF-values are all below 1.1 so multicollinearity

should not be a problem (Field, 2000).

4.2 Results multivariate analysis

In Table 5 the results of the multivariate regression analysis are presented. Through the multivariate regression analysis the prevalence of the variables in explaining the capital structure of Dutch SMEs is tested. Table 5 contains three models. The first model contains the results of the testing of the variables of the trade-off theory and their relation to the leverage ratio. The second model contains the results of the pecking order theory-variables related to the leverage ratio. The third and last model of Table 5 contains an analysis of the variables of both theories and their relation to the leverage ratio.

Looking at Table 5 the first determinant in line with the trade-off theory 'Firm size' has in both Model 1 and Model 3 a significant negative relation with the leverage ratio of Dutch SMEs. This is not in line with the trade-off theory which states that the larger the firm is, the more leveraged it is. This is because the larger the firm, the lower the information asymmetry. The lower the information asymmetry is, the easier a company can get loans according to the trade-off theory. Therefore a positive relation was expected (H1) but statistical regression shows a negative relation so Hypothesis 1 gets no support. The determinant 'Business risk' is insignificantly related to the leverage ratio both in Model 1 and Model 3. Therefore nothing can be said about this variable determining the capital structure of Dutch SMEs. The same holds for the 'Effective tax rate' which also is insignificant related to the leverage ratio both in Model 1 and Model 3. So Hypothesis 2 and Hypothesis 3 get no support and have to be rejected. Concerning the 'Non-debt tax shields' Table 5 presents interesting results. In Model 1 this determinant is significantly positively related to the leverage ratio of Dutch SMEs. However in Model 3 the results show a negative relation which is significant between 'Non-debt tax shields' and leverage ratio. Because of the higher adjusted R^2 value of section 3 more attribution should be given to the significant negative relation between 'Non-debt tax shields' and the leverage ratio than to a significant positive relation. The significant negative relation between 'Non-debt tax shields' and the leverage ratio is in line with Hypothesis 4 following the trade-off theory and therefore

Table 4: Correlations of the variables

	Leverage ratio	Firm size	Business risk	Effective tax rate	Non-debt tax shields	Profitability	Liquidity	Age
Leverage ratio	1							
Firm size	-0.14**	1						
Business risk	-0.02	0.01	1					
Effective tax rate	-0.02	0.02	0.01	1				
Non-debt tax shields	0.07**	-0.11**	-0.01	-0.01	1			
Profitability	-0.20**	-0.04**	0.15**	0.07**	-0.09**	1		
Liquidity	-0.61**	0.12**	-0.00	0.00	-0.19**	0.11**	1	
Age	-0.04*	-0.03*	0.00	0.00	0.04*	-0.05**	0.02	1

This table reports the correlations between the variables. For definitions of the variables see Table 3.
 ** = correlation is significant at the 1% level (2-tailed). * = correlation is significant at the 5% level (2-tailed).

Table 5: Multivariate OLS-regression

	Expected relationship with leverage ratio	MODEL 1 Variables trade-off theory	MODEL 2 Variables pecking order theory	MODEL 3 Variables trade-off theory and pecking order theory
Constant		1.50*** (17.92)	0.81*** (152.13)	1.33*** (19.83)
Firm size	+	-0.06*** (-10.49)		-0.03*** (-7.50)
Business risk	-	0.00 (1.14)		0.00 (-0.35)
Effective tax rate	+	0.00 (0.09)		-0.01 (0.47)
Non-debt tax shields	-	0.20** (2.75)		-0.34*** (-5.77)
Profitability	+ (TOT) - (POT)	-0.34*** (-15.18)	-0.23*** (-12.62)	-0.24*** (-13.33)
Liquidity	-		-0.09*** (-55.12)	-0.09*** (-54.42)
Age	-		0.00** (-2.73)	0.00** (-2.81)
Number of firm-year observations	5235	5235	5235	5235
R ²		0.06	0.40	0.40
Adjusted R ²		0.06	0.39	0.40

This table reports the results of the regression for the firm-level determinants of leverage ratio. First the expected relationships between the determinants in line with the trade-off theory (TOT) and/or pecking order theory (POT) and the leverage ratio are given. Model 1 gives the regression results of the variables of the trade-off theory. Model 2 gives the regression results of the variables of the pecking order theory. Model 3 gives the results for the variables of both the trade-off theory and the pecking order theory. The dependent variable of Model 1, Model 2 and Model 3 is 'Leverage ratio'. Definitions of the variables are given in Table 3. Because of the low (all below 2.00) VIF-values of the determinants multicollinearity is not present. The variables are also checked for heteroscedasticity.

*** = correlation is significant at the 0.1% level (2-tailed). ** = correlation is significant at the 1% level (2-tailed). * = correlation is significant at the 5% level (2-tailed). T-values are represented in the parentheses.

this hypothesis has to be accepted.

The first determinant in line with the pecking order theory 'Liquidity' is significant negatively related to the leverage ratio of Dutch SMEs both in Model 2 and Model 3. This is in line with the pecking order theory and therefore hypothesis H6, which expects a negative relation between leverage ratio and 'Liquidity' because liquid firms tend to borrow less, founds support. Further the determinant 'Age' is positively related to the leverage ratio significantly both in Model 2 and Model 3. This isn't in line with the pecking order theory because this theory states that older firms relatively easier can retain profits and therefore have less use for debt in their financing and therefore expects a negative relationship between 'Age' and leverage ratio. Therefore Hypothesis H7 gets no support.

The determinant 'Profitability' occurs in both theories in describing the capital structure of Dutch SMEs. The trade-off theory expects a positive relation, the pecking order theory a negative relation. The results in Table 5 show in all three Models a significant negative relationship between 'Profitability' and leverage ratio, and therefore the relation is in

line with the pecking order theory. The expectation of the pecking order theory of a negative relation originates from the reasoning that profitable firms have more internal funds and therefore less use for external debt financing. Therefore Hypothesis 5 gets no support whereas Hypothesis 8 gets support.

The adjusted R² is a measure that presents how close the observed data is to the 'line-of-best-fit' which is created by the OLS-regression. Model 1 of Table 5 shows an adjusted R² of 0.06 which implies that 6.0% of the variance in the leverage ratio is explained by Model 1. The second Model shows a considerable higher adjusted R²; 0.39 which means that 39.0% of the variance in the leverage ratio of Dutch SMEs is explained by the determinants in Model 2. The adjusted R² of Model 3 is 0.40 which means that 40.0% of the variance in the leverage ratio of Dutch SMEs is explained by the independent variables of both theories used in this study.

4.3 Discussion

In this section the results of the OLS-regression are discussed and compared with literature on capital structure of SMEs and Dutch SMEs.

The significant negative relation between 'Firm size' and leverage ratio is surprising and not in accordance with Hypothesis 1. Hall et al. (2004) and Degryse et al. (2010) found all a positive significant relation which is in line with the trade-off theory. A possible explanation for the founded result lies in the pecking order theory. This theory expects size to have a negative relation with the leverage ratio because larger firms face lower information costs and therefore can obtain more internal funds and so don't require debt financing (López-Gracia and Sogorb-Mira, 2008).

The insignificant relation between 'Business risk' and leverage ratio cannot be compared with studies on Dutch SMEs because this studies don't include this possible determinant. However Cassar and Holmes (2003), studying the capital structure of Australian SMEs, also found an insignificant relation. This raises questions about whether the 'Business risk' is important in the capital structure of SMEs, especially the Dutch. Between the 'Effective tax rate' and leverage ratio also an insignificant relation is found. The Dutch studies don't include this determinant in their regression but Michaelas et al. (1999) and López-Gracia and Sogorb-Mira (2008) do in studying UK and Spanish SMEs. They found an insignificant relation also. The results of this imply that owners of Dutch SMEs don't consider the 'Effective tax rate' and the 'Business risk' in their capital structure decisions.

The significant negative relation of 'Non-debt tax shields' and leverage ratio, visible in Model 3 of Table 5, is in line with the trade-off theory and corresponding Hypothesis 4. The study of Degryse et al. (2010) shows a contrasting result; they found a insignificant relation. The study of Michaelas et al. (1999) also shows an insignificant relation. However the study of Sogorb-Mira (2005; Spanish SMEs) found, in accordance with current study, a significant negative relation. The result implies that Dutch SMEs base their debt financing decision (among other factors) on the 'Non-debt tax shields' that are present.

The determinants 'Liquidity' and 'Age' are both significantly related to leverage ratio. The determinant 'Liquidity' is negatively related which is in accordance with Hypothesis 6 and provides support for the pecking order theory in explaining the capital structure of Dutch SMEs. For the determinant 'Liquidity' no research has been done before among Dutch SMEs so the result can't be compared. Studies investigating the relation of 'Liquidity' and leverage ratio among SMEs are scarce, the ones that do make use of other proxies for liquidity. A research studying the capital structure of (among others) Dutch firms in general (De Jong et al, 2008) founded, in accordance with current study, a significant negative relation between 'Liquidity' and leverage ratio. Concerning the determinant 'Age', which is significantly positively related to leverage ratio in current study, Hall et al. (2004) found no significant result. Michaelas et al. (1999) however shows a significant negative relation which is not in accordance with current study. Hypothesis 7 expecting a negative relation between 'Age' and leverage ratio has, looking to the results, to be rejected. The age of a Dutch SME hasn't a significant negative effect on the leverage ratio of the SME.

The firm-level determinant 'Profitability' which was used to describe expectations on both theories shows in current study a significant negative relation which is in line with the pecking order theory. Contrary to current study the study of Hall et al. (2004) shows a significantly positive relation between profitability and leverage ratio. The study of Degryse et al. (2010) shows a significantly negative relation which is in line with the pecking order theory and current study. Hypothesis 5, expecting a positive relation according to the trade-off theory, is rejected. Hypothesis 8, expecting a negative relation according to the pecking order theory, is accepted because of the results. This implies that theory firms first use internal funds before external funds in their financing. Dutch SMEs with higher profits will have more internal funds and therefore will use these funds first before using debt financing.

Investigating the results and the significance levels of the variables the capital structure of Dutch SMEs is significantly influenced by; 'Firm size', 'Non-debt tax shields', 'Profitability', 'Liquidity' and 'Age'. With two the hypotheses of the pecking order theory being confirmed with high coefficients this theory performs better than the trade-off theory in explaining the capital structure of Dutch SMEs. This can be seen back in the coefficients and the adjusted R^2 of the pecking order theory in Table 5 which are more convincing than that of the trade-off theory. Because the adjusted R^2 of Model 2 (POT) is almost the same as the adjusted R^2 of Model 3 the determinants in line with the pecking order theory contribute the most to the variance in the leverage ratio.

5. CONCLUSION

With the use of the Ordinary Least Squares this thesis empirically tested the determinants of the capital structure of Dutch SMEs. This study focussed on the trade-off theory and the pecking order theory in explaining capital structure from which variables were developed. According to the regression analysis 'Non-debt tax shields', 'Profitability' and 'Liquidity' are the most important firm-level factors in determining the leverage ratio of Dutch SMEs. Overall 5 out of 7 firm-level factors are significantly determining the capital structure. 2 out of 6 determinants ('Profitability' and 'Liquidity') support the pecking order theory and 1 out of 6 determinants ('Non-debt tax shields') give support to the trade-off theory in explaining Dutch SME capital structure choice. The determinants 'Firm size' and 'Age' also are significantly related to leverage ratio. However these 2 determinants aren't in line with the expected relation based on the theory.

The contribution of this study to the existing research is that it gives valuable insights in the determinants of the capital structure of Dutch SMEs. Research on the capital structure of Dutch firms, especially SMEs, is scarce. Besides that this study makes use of recent data. The findings of this study can be used by Dutch SME owners in choosing their optimal capital structure for their enterprise, and can be used by the Dutch government in aligning their policies with SMEs' financing aspirations.

Inevitable this study has also some limitations. Besides the trade-off theory and the pecking order theory there are many more theories, like the agency theory, market timing theory and flexibility theory, which could influence the capital structure as well. The choice to focus only on 2 theories is because an in-depth study of two theories explains capital structure better than a study investigating all available theories (Shyam-Sunder and Myers, 1999). Another limitation is that the database used in this study, Reach, contains relatively not many small SMEs

(Degryse et al. 2010) so the outcomes of this study may not be relevant for small SMEs. For future research on capital structure of Dutch SMEs I would recommend using different proxies for leverage ratio, and split leverage ratio out into long- and short-term leverage ratio. Further I haven't included industry differences in the testing which could be done by future research also.

7. REFERENCES

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