The Impact of Capital Structure on Firm Performance: an Investigation of Dutch Unlisted SMEs

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ABSTRACT,
The aim of this study is to research the effect of capital structure on firm performance based on panel data of Dutch small and medium-sized enterprises between 2008 and 2015. Moreover, two sub-panels have been created to investigate potential changes in the effect for the period of the financial crisis and for the post-crisis period. The effect was studied in the perspectives of two prominent capital structure theories, the trade-off and pecking order theory, which assume opposing signs for the relationship. Two different empirical models have been created that used return on assets (ROA) and return on capital employed (RCOE) as proxies for performance. Capital structure was measured by the total leverage and the combination of long-term and short-term obligations in proportion to total assets. The empirical results show a negative and highly statistically significant relationship between all proxies of capital structure and the ROA as a performance proxy, which is in line with the pecking order theory. The results for ROCE as a proxy for performance are mixed but statistically significant, which can be explained by the fact that ROCE is using earning before interest and tax (EBIT) as a performance indicator.

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1. INTRODUCTION

Small and medium-sized enterprises (referred to as SMEs in the following) represent a major factor in national economies as well as in the global economy. Muller et al. (2016) consider non-financial SMEs in the EU28 as a major contributor, since they account for "99.8% of all enterprises, 57.4% of value added, and 66.8% of employment" (p. 3). Compared to large organizations, SMEs have to operate their businesses with a restricted availability of resources, since their management has to cope with an ambiguous structure, hierarchy and responsibility within the organization and eventually, the decision-making is closely linked to the owner or top-management (Hutzschenreuter, 2009). Given these restrictions for SMEs, research by Muller et al. (2016) showed that the average profitability of SMEs in the EU28 is €0.08 per €1 of sales, while the profitability of large enterprises is €0.09 per €1 of sales. Moreover, the research showed an even greater difference (€0.02 per €1 of sales) in profitability between SMEs and larger firms in the Netherlands. SMEs are known for their backbone-character in national economies and are very distinct from larger corporations, which are only some reasons why a myriad of international researchers have been investigating SMEs in their studies already.

Nevertheless, when SMEs are exposed to times of financial crisis their financing sources become volatile, since operating revenues tend to decline and moreover, in times of financial downturns, banks grant fewer credits in order to adjust their liquidity (Cornett et al., 2011). Since, bank loans are the major source of external finance for small firms (Petersen & Rajan 1994), a financial crisis would consequentially affect their capital structure. Such a shortage in credit supply during a financial crisis was confirmed by Campello, Graham and Harvey (2010) who surveyed 1,050 Chief Financial Officers across three continents. They report that corporations had to rely on internally generated funds such as retained earnings in order to cover their finance needs during the financial crisis in 2008. The financial crisis analysed in this study is the one that occurred in 2007 and 2008, which led to a period of recession in the European economy in the first half of 2009 (Palepu, Healy & Peek, 2010).

Being able to rely on internally generated funds sheds light on the performance of SMEs. The performance of a firm is generally a tool that assesses if a corporation is performing in an expected manner or not (Boddy, 2014). In this case, the operational performance is of relevance, as periodical earnings or revenues are essential units in the assessment of business performance (McLaney & Atrill, 2014). The business performance is an important criterion when corporations are seeking for new finance streams, whether internal or external ones.

Thus, a corporation's capital structure is inevitably linked to the performance of the organization. Where the securities and means of finance used by firms to fund their business activities is the foundation of the study of capital structure (Myers, 2001). Capital structure choices are less diverse for SMEs, as Petersen and Rajan (1994) state that the major source of external finance for small enterprises is bank finance. Subsequently, those enterprises are dependent on banks, whose credit supplies are affected by the state of the economy. Moreover, when firms increase their leverage, they simultaneously increase the risk (Hiller et al., 2014).

The focus of this thesis will be on the effect of capital structure on firm performance of unlisted SMEs in the Netherlands in general and during as well as after the financial crisis of 2008. So far, research on Dutch SMEs' capital structure has been conducted throughout different time periods and in different settings. For instance, Degryse, de Goeij and Kappert (2012) researched the determinants of capital structure of Dutch SMEs with regard to firm and industry characteristics in the period of 2003 to 2005. Nevertheless, this thesis will be investigating the impact of capital structure on firm performance, which, to my best knowledge, has not done before for Dutch SMEs. Additionally, the research will be investigating whether differences in capital structure can be noted during and after the financial crisis of 2008, which has also not been done for Dutch SMEs yet. Therefore, the research aims to contribute to the existing studies about the capital structure of SMEs that have been conducted in different settings and time periods. Moreover, the thesis contributes to closing a currently existing research gap on Dutch SMEs' firm performance during and after the financial crisis of 2007 and 2008. This is an interesting topic to study, as the Netherlands seem to recover from the crisis from 2012 onwards. The annual growth rate of the gross domestic product (GDP) is drastically dropping from 2008 to 2009 and then fluctuating until 2012, from where on a steady upwards trend holds until 2015 (The World Bank Group, 2017). My motivation is to provide new empirical evidence for the recent financial crisis and its aftermath with this panel study.

Therefore, the main research question of this bachelor thesis is:

"Does the capital structure of private small and medium-sized enterprises in the Netherlands influence their firm performance between 2008 and 2015?"

Almost all proxies for capital structure used in this study, show a negative and statistically significant relationship to the proxies of SME performance. This results show that the pecking order theory holds true for Dutch SMEs during and after the financial crisis.

2. THEORETICAL FRAMEWORK

In order to get a comprehensive understanding of the concepts related to the field of this research, relevant literature about capital structure, firm performance and financial crises have been reviewed. This chapter aims to introduce and summarize the most prevailing concepts in the field and based on these hypotheses have been developed.

2.1 Summary of the Literature

Researchers have identified different determinants of capital structure. Harris and Raviv (1991) identified four respective categories that deal with the conflict of interests, asymmetric information, the influence on products or competition, and corporate control. Conflicts of interest describe the gap between the objectives of debt holders and equity holders (Harris & Raviv, 1991). The asymmetry of information is concerned with the superior amount of information insiders have compared to outsiders (Harris & Raviv, 1991). Influencing products or competition addresses according to Harris and Raviv (1991) the influence of capital structure on competitive strategy and product characteristics. Ultimately, corporate control is related to takeover activities, as equity in form of common shares involve voting rights contrary to borrowed capital (Harris & Raviv, 1991). Furthermore, other studies identified size as a determinant of capital structure because of diversification effects and higher capital needs (Degryse, de Goeij & Kappert, 2012; Sogorb-Mira, 2005). Moreover, the tangibility of assets

was found to be determining capital structure too (Proença, Laureano & Laureano, 2014; Michaelas, Chittenden & Poutziouris, 1999; Jõeveer, 2013). The capital structure of European SMEs has been subject to academic research (among others: Degryse, de Goeij & Kappert, 2012; Proença, Laureano & Laureano, 2014; Sogorb-Mira 2005; Michaelas, Chittenden & Poutziouris, 1999; Heyman, Deloof & Ooghe, 2007; Hall, Hutchinson & Michaelas, 2004).

Previous research investigated the effect of capital structure on firm performance in different international settings. For instance, Abeywardhana (2015) investigated this effect for SMEs based in the UK from 1998 until 2008. The results show a negative and significant relationship. Moreover, Akeem et al. (2014) researched manufacturing organizations in Nigeria in the time frame from 2003 to 2012 for identical purposes. Their research used publicly listed companies and found also a negative relation between capital structure and performance. In addition, Salim and Yadav (2012) provided evidence for a negative relationship between capital structure and firm performance for Malaysian listed enterprises from 1995 to 2011. This relationship is negative for all proxies of capital structure used in their research, which are short-term debt, long-term debt and total debt ratios. Zeitun and Tian (2007) researched this relationship for Jordanian enterprises from 1989 until 2003. Their main findings identified a negative relationship for both accounting and market measures of capital structure and performance. Moreover, they found the Gulf Crisis, which occurred from 1990 to 1991, to have a positive impact on the performance of the firms in their sample.
All of the studies found the relationship between capital structure and performance to be negative. In contrast, Javed, Younas and Imran (2014) found mixed results for the effect for Pakistani firms from 2007 to 2011. In contrast, Gill, Biger and Mathur (2011) found a positive relationship between leverage and profitability for American listed companies in the service industry.
During a financial crisis, researchers found short-term debt to increase, while long-term debt decreases (among others: Fosberg, 2013). These findings can be explained by the shortage of capital in the market and increased risk, as described earlier.

2.2 Theories and Concepts

2.2.1 Theoretical Background

The foundation of the study of corporate capital structure rests on the theorem of Modigliani and Miller (1958). They emphasize that a firm's capital structure can be financed in various ways, ranging from debt financing only to equity issues only (Modigliani & Miller, 1958). However, Modigliani and Miller's (1958) theorem states that an enterprise's value is independent of the underlying capital structure. This theorem however, holds true only in the absence of taxes, information asymmetries and bankruptcy costs, which is the reason why Modigliani and Miller (1963) adapted their work and included taxes, since tax-deductible interest payments can be increasing firm value. The two most well known financing theories, the trade-off theory and the pecking order theory, are briefly discussed below.

2.2.2 The Trade-off Theory

Based on the static trade-off theory, corporations have a target debt ratio and attempt to move toward this target ratio (de Jong, Verbeek & Verwijmeren, 2010). The target ratio is concerned with interest payments on debt positions, which are tax deductible and therefore, decrease the earnings on which taxes have to be paid as denoted by Modigliani and Miller (1963). When the deductible tax benefit equals the cost for financial distress, the target ratio is reached (Hiller et al., 2014). However, debt obligations result in outflowing funds as interest and redemption have to be paid, which in turn shrink the company's liquidity. Moreover, when corporations borrow funds, costs of financial distress need to be considered (Myers, 1984). Furthermore, Myers (1984) noticed that costs of adjustments in capital structure hamper firms to achieve their optimal ratio, since unexpected incidents can lead to deviations from the optimum. The trade-off theory states that the optimal capital structure is where the advantages of using debt are in balance with the costs associated to the debt (Myers, 1984). Thus the trade-off theory assumes a positive relationship between leverage and performance under normal economic conditions. However, during a financial crisis, the trade-off theory assumes a negative relationship between leverage and performance, as the increasing risk and shortage in capital lead debt to be more costly.

2.2.3 The Pecking Order Theory

The underlying assumption of the pecking order theory is information asymmetry, as managers know more about the corporation they manage and its future outlooks compared to outsiders (Harrison & Wisnu Widjaja, 2014). Given the pecking order theory, organizations favour the use of internal financial resources over external finance (Hiller et al. 2014) given the asymmetry of information and thus the underlying costs of raising capital. However, when organizations are in need of external finance, "(…) firms prefer debt to equity because of lower information costs associated with debt issues" (Frank & Goyal, 2002, p. 218). According to Hiller et al. (2014) the pecking order theory comes with three major implications compared to the static trade-off theory: "(1) no target capital structure, (2) profitable firms use less debt, (3) companies will want financial slack" (p. 454). Profitable firms use internally generated funds for their investments, which is why they are assumed to employ less debt. However, during a financial crisis it is likely that the profitability decreases and thus the need for external sources of finance arise since the internally generated funds do no longer cover the capital requirements.
Following the pecking order theory, companies prefer the use of internal finance and therefore, the more profitable a firm is the lower the debt to equity ratio shall be (Fama & French, 2002). Thus it is expected that a negative relationship exists between the debt-to-equity ratio and performance, which was found to be true in multiple previous studies (among others: Gabrijelčič, Herman & Lenarčič, 2016; Zeitun & Tian, 2007; Akeem et al., 2014; Fama & French, 1998). However, during a financial crisis when a company's profitability decreases the relationship between leverage and performance is assumed to be positive as corporations may seek for alternative finance sources others than internal finance. Yet other means of finance may also not available to SMEs during a recession.

2.3 Development of Hypotheses

The research questions leads to the following hypotheses. The testing of the hypotheses is described in the methodology part below.

Following the trade-off theory, organizations are employing debt in order to benefit from tax-deductible interest payments (Modigliani & Miller, 1963). As the target debt ratio is where advantages and costs of debt are in balance (Myers, 1984), the trade-off theory suggests a positive relationship between capital structure and performance. So in line with the trade-off theory:

H1a: The capital structure of private Dutch SMEs positively influenced their firm performance between 2008 and 2015.

In contrast, the pecking order theory suggests that companies prefer the use of internally generated funds over the use of external sources of finance (Hiller et al., 2014). Given this aversion of debt, a negative relationship can be expected between leverage and performance. So in line with the pecking order theory:

H1b: The capital structure of private Dutch SMEs negatively influenced their firm performance between 2008 and 2015.

Since small enterprises' main source of external finance are bank loans (Petersen & Rajan, 1994), these enterprises are very dependent on banks. The financial crisis was found to have an impact on the capital structure of firms. Research by Fosberg (2013) showed that proxies for short-term debt increased during the crisis period and proxies for long-term debt decreased. Therefore, a variation in the impact of capital structure on firm performance can be expected during the crisis period compared to the post-crisis period, which leads to the following hypothesis:

H2: The impact of the proxies of capital structure of private Dutch SMEs on firm performance is less negative during the financial crisis period compared to the post-crisis period.

Table 1: SME Overview by SIC Code

SIC		# of SMEs	% of SMEs
0	Agriculture, Forestry, Fishing, Hunting and Trapping	114	3.39%
1	Mining, Construction	370	11.00%
2	Light Manufacturing	403	11.98%
3	Heavy Manufacturing	425	12.63%
4	Transportations, Communications, Electric, Gas, and Sanitary Services	527	15.67%
5	Wholesale and Retail Services	1,187	35.29%
7	Services	337	10.02%
	Total	3,363	100.00%

The two control variables, size and liquidity are frequently used in capital structure studies (among others: Abeywardhana, 2015; Zeitun & Tian, 2007). Fama and French (2002) "(…) assume that larger more diversified firms are likely to have less volatile earnings and net cash flows" (p. 8), as both theories, trade-off and pecking order, suggest that larger cash flows and higher volatile earnings result in less leverage (Fama & French, 2002). Yet it is to be noted that expanding firms increase their debt position due to higher needs of funds (Degryse, de Goeij & Kappert, 2012). Due to the effects of diversification and easier access to capital, large firms should be more profitable.

H3: SME size increases performance between 2008 and 2015.

In line with the pecking order theory, firms prefer the use of internally generated funds over external funds (Hiller et al., 2014). Accordingly, a firm's liquidity can be used to internally finance investments, which in turn make external funding redundant. Among others, Harrison and Wisnu Widjaja (2014) found this to be true in their research. However, since internal funds are used to finance investments the corporation forfeits its performance.

H4: Liquidity decreases performance between 2008 and 2015.

3 METHODOLOGY AND DATA

This chapter describes the data collection and the respective sample, the dependent, independent and control variables used in this research, and moreover, describes the research design and methodology.

3.1 Data and Sample

The dataset was obtained from the database Reach, which is operated by Bureau van Dijk. The Reach database encompasses financial and non-financial information about Dutch companies. However, publicly listed firms are not covered in this bachelor thesis, as they differ in their nature from unlisted companies in terms of governance, reporting and regulations.
The data was selected for the time frame of 2008 until 2015. Whereby, only those companies have been selected that have the Netherlands as their office country and that have reported unconsolidated statements, which led to an initial sample of 763,653 companies. The respective sample was then filtered according to the criteria of SMEs as determined by the European Union, which determines that small and medium-sized enterprises "(…) employ fewer than 250 persons and

Table 2: Definition of Variables

Variable	Abbreviation	Expected Sign	Definition
Dependent Variables:			
Performance	ROAwin		Net income divided by total assets
	ROCEwin		Earnings before interest and tax (EBIT) divided by capital employed (total assets minus current liabilities)
Independent Variables:			
Capital Structure	TDwin	+/-	Total debt divided by total assets
Capital Structure	LTDwin	-	Long-term debt divided by total assets
Capital Structure	STDwin	+/-	Short-term debt divided by total assets
Control Variables:			
Size	LOGSIZEwin	+	Natural logarithm of total assets
Liquidity	LIQwin	+/-	Current assets divided by current liabilities
Dummy Variables:			
Industry	SIC		Dummy variable to account for differences across industries
Crisis	dumCrisis		Dummy variable for financial crisis, where 1 stands for the crisis period between 2008 and 2011, and 0 for the post-crisis period between 2012 and 2015

which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million" (Commission Recommendation 2003/361/EC, 2003, p. L 124/39). However, micro enterprises are excluded from this research. By definition a micro enterprise is "(…) an enterprise which employs fewer than 10 persons and whose annual turnover and/or balance sheet total does not exceed EUR 2 million" (Commission Recommendation 2003/361/EC, 2003, p. L 124/39). When two of the three criteria of the SME definition were met, the organization is treated as a SME and is included into the sample. Eventually, only those companies that provided at least three data points for each variable have been selected, which can in turn lead to an unbalanced sample as data might not be available for all eight years. Moreover, it is to be mentioned that financial institutions are not considered in the sample, as their capital structure differs in nature from non-financial corporations. Also, non-profit and governmental organizations have been excluded from the sample. Thus, organizations with a US SIC code between 6000 to 6999 as well as 8000 to 9999 have been removed from the data set. After the filtering process as just described, the following sample with regard to the SIC coding, was retrieved and was used for conducting the research. The SMEs have been classified respective to the industries they are active in. This is the case, as in line with the trade-off theory, target capital structures may vary across different types of industries (Degryse, de Goeij & Kappert, 2012).

The final data set contained 3,363 unlisted SMEs, which are the subject of this analysis. Table 1 provides an overview over the industry distribution of the SMEs in the sample. Only few SMEs are in the agriculture, forestry, fishing, hunting and trapping industry (3.39%), whereas the majority of SMEs in the sample ascribed to the industry branch of wholesale and retail services (35.29%). The distribution for the remaining industry branches, mining and construction (11%), light manufacturing (11.98%), heavy manufacturing (12.63%), transportations, communications, electric, gas, and sanitary services (15.67%), and services (10.02%), is relatively similar.
The sample data was used for the calculation of the following dependent, independent and control variables. In order to reduce the impact of outliers, the SME-specific variables have been winsorized at the 1st percentile in each tail, which is in line with previous research (Zubair, 2015).

3.1.1 Definition of Variables

3.1.1.1 Dependent Variable: Performance

The performance of a company will be assessed by using Return on Assets (ROA), which is an indicator for profitability in relation to the total assets (Abeywardhana, 2015). Following Abeywardhana (2015), ROA is composed of net income divided by total assets. Moreover, Return on Capital Employed (ROCE) will be used in order to assess how efficient the capital was employed (Abeywardhana, 2015). The ROCE is calculated by dividing the earning before interest and tax (EBIT) by the capital employed, which is total assets minus current liabilities (Abeywardhana, 2015).

3.1.1.2 Independent Variable: Capital Structure

The capital structure of an enterprise can be determined in different ways. However, this thesis will be using the following three determinants of leverage, based on Abeywardhana (2015): (1) total debt divided by total assets, (2) long-term debt divided by total assets and (3) short-term debt divided by total assets.

3.1.1.3 Control Variables: Size and Liquidity

Firm performance is not solely influenced by capital structure, therefore, control variables are used to create a more elaborated overview of performance determinants. The liquidity ratio indicates the firm's solvency in order to repay its short-term debt positions (McLaney & Atrill, 2014). It is calculated by dividing the current assets by the current liabilities (Abeywardhana, 2015). The firm's size matters in terms of volatility in earning, as larger firms tend to be more diversified (Degryse, de Goeij & Kappert, 2012). Following previous approaches, the size is determined by the natural logarithm of total assets (Abeywardhana, 2015).

3.1.1.4 Dummy Variables: Crisis

In order to investigate whether the financial crisis was negatively affecting firm performance, a dummy variable for the crisis period is created. The time frame from 2008 until 2011 is being considered as the time of the financial crisis (Zubair, 2015), whereas the time frame from 2012 until 2015 is considered as post-crisis period. The definition of the crisis and post-crisis period can further be based on the annual growth rate of the GDP of the Netherlands. The crisis caused a major breakdown from 2008 to 2009 (The World Bank Group, 2017). Moreover, the GDP growth rate shows fluctuations in the years after the crisis and starts to fully recover from 2012 on, where the trend is continuously positive (The World Bank Group, 2017), which is why the post-crisis period starts from 2012 on in this study.

3.2 Research Design and Methodology

The research design of this thesis is a panel study since the data is collected from the same sample at several points in time (Babbie, 2012). More precisely, the annual year-end reports of the various companies are the points of measurement.
After the data has been collected, the descriptive statistics and a correlation analysis are conducted. The resulting "(…) correlation coefficient gives an impression of the strength of the relationship between the dependent and the independent variables" (Huizingh, 2007, pp. 299-300). When the results suggest a linear relationship, a regression analysis is performed, in order to predict the dependent variable $Y = \beta_0 + \beta_1 X + e$.

Table 3: Descriptive Statistics

Full Sample							**Crisis and Post-Crisis Panel**					
							Crisis Period (2008-2011)		Post-Crisis Period (2012-2015)		Difference	
Variable	Obs	Mean	Median	SD	Min	Max	Mean	Median	Mean	Median	Mean	Median
ROAwin	20936	.028	.029	.137	-.637	.46	.026	.025	.030	.032	.004*	.0007*
ROCEwin	20114	.146	.104	.593	-2.569	3.349	.16	.109	.14	.1	-.023*	-.0009*
TDwin	25215	.755	.7	.464	.037	3.627	.759	.716	.752	.685	-.007	-.031*
LTDwin	19626	.27	.163	.341	.001	2.246	.27	.17	.27	.156	-.001	-.014*
STDwin	25133	.507	.481	.319	.005	1.904	.51	.488	.504	.474	-.004	-.014*
LOGSZwin	25248	3.95	3.911	.511	2.158	5.623	3.944	3.9	3.956	3.922	.012*	-.022*
LIQwin	25082	2.136	1.361	3.501	.042	29.385	1.965	1.334	2.303	1.389	.339*	.055*

* indicates significance at the 5% level. All variables are defined in Table 2.

Following this formula, β_0 is the intercept, β_1 is the slope of the regression line and e is the error term, which is the difference between the actual value and the predicted value (Huizingh, 2007).

Since panel data is analysed it was necessary to check for a panel effect. For this purpose a Breusch-Pagan test was performed (Wooldridge, 2012). As the results showed to be significant a panel effect was confirmed, which made the use of an ordinary least square regression model redundant. Subsequently, a Hausman test was performed for each model in order to identify whether a fixed-effects or random-effects model needs to be performed for the regression analysis. The test results for all models were significant and showed a high Hausman-statistic, which led to the conclusion that the fixed-effects model needs to be applied. Furthermore, the fixed-effects model approach was applied in comparable panel data studies about SMEs (among others: Degryse, de Goeij & Kappert, 2012; Michaelas, Chittenden & Poutziouris, 1999). The analysis was carried out in Stata, a data analysis and statistical software.

3.2.1 Empirical Model

The first model measures the effect of capital structure on performance, both based on proxies for total debt and, long-term and short-term debt, given the ROA (Abeywardhana, 2015).

Model 1a:

$$ROAwin_{i,t} = \alpha_0 + \beta_1 TDwin_{i,t} + \beta_2 LOGSIZEwin_{i,t} + \beta_3 LIQwin_{i,t} + \beta_4 dumCrisis + \varepsilon_{i,t}$$

Model 1b:

$$ROA_{i,t} = \alpha_0 + \beta_1 LTDwin_{i,t} + \beta_2 STDwin_{i,t} + \beta_3 LOGSIZEwin_{i,t} + \beta_4 LIQwin_{i,t} + \beta_5 dumCrisis + \varepsilon_{i,t}$$

The second model measures the effect of capital structure on performance, both based on proxies of total debt and, of long-term and short-term debt, given the ROCE (Abeywardhana, 2015).

Model 2a:

$$ROCE_{i,t} = \alpha_0 + \beta_1 TDwin_{i,t} + \beta_2 LOGSIZEwin_{i,t} + \beta_3 LIQwin_{i,t} + \beta_4 dumCrisis + \varepsilon_{i,t}$$

Model 2b:

$$ROCE_{i,t} = \alpha_0 + \beta_1 LTDwin_{i,t} + \beta_2 STDwin_{i,t} + \beta_3 LOGSIZEwin_{i,t} + \beta_4 LIQwin_{i,t} + \beta_5 dumCrisis + \varepsilon_{i,t}$$

The denotation of i in the regression formula stands for the company and the denotation of t stands for the time. In other words, $ROA_{i,t}$ stands for the return of assets of SME i in year t. Both models are performed for the time frame between 2008 and 2015 in order to answer the overall research question. Moreover, both models are performed for the time frames from 2008 to 2011 and from 2012 to 2015 in order to test whether differences can be found during the crisis and after the financial crisis. Therefore, a dummy variable for the financial crisis was created as described above.

4 EMPIRICAL FINDINGS

4.1 Descriptive Statistics

The summary of the statistics can be found in table 3, where the statistics for the entire sample, the crisis period and post-crisis period are listed. Generally, the panel had a yearly mean (median) ROA of 2.8% (2.9%), which in comparison is relatively lower to SMEs in the UK, which showed an average ROA of 7.3% in a pre-crisis setting from 1998 to 2008 (Abeywardhana, 2015). Moreover, the descriptive statistics showed that the average (median) ROA increased slightly to 3% (3.2%) in the post-crisis period compared to the crisis period, where it was 2.6% (2.5%). This change was found to be significant at the 5% level.

For the second performance variable, ROCE, a yearly average of 14.6% (10.4%) was found for Dutch SMEs, which is again less compared to the UK, where SMEs had on average 25% ROCE (Abeywardhana, 2015). The average (median) ROCE decreased to 14% (10%) in the post-crisis period compared to 16% (11%). This decline was found to be significant at the 5% level.

Dutch SMEs showed an average (median) leverage ratio (*TDwin*) of 76% (70%), which can further be split into the average ratio for long-term obligations (*LTDwin*) with an average (median) of 27% (16%) and the ratio short-term obligations (*STDwin*) with an average (median) of 51% (48%). This shows that Dutch SMEs relied much more on short-term debt instruments than on long-term facilities. Furthermore the averages (medians) for the ratios for leverage, long-term debt and short-term debt all slightly decreased after the financial crisis compared to the crisis period, however, the changes were not found to be significant.

The average (median) size of Dutch SMEs is €45,198,000 (€8,140,000) in total assets. The average (median) size increased from €38,130,000 (€7,946,000) during the crisis to €52,105,000 (€8,347,000) in the post-crisis period. This change was found to be significant at the 5% level. It is to be noted that the average size exceeds the balance sheet total given in the SME definition by the EU. This is the case, as companies in the sample have been treated as a SME when two of the three criteria of the definition were met.

Finally, the overall average (median) for the liquidity ratio of Dutch SMEs was fairly solid with 214% (136%), which indicates that short-term obligations can be easily covered with short-term assets. The average (median) liquidity of Dutch SMEs increased from 197% (133%) to 230% (139%) in the post-crisis period. This rise was found to be significant at the 5% level.

4.2 Correlation

The correlation matrix can be found in table 4 below. ROA was observed to have a medium negative correlation (-.45) with the total leverage ratio (*TDwin*) and a moderate negative correlation

Table 4: Pearson Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ROAwin	1						
(2) ROCEwin	.382*	1					
(3) TDwin	-.453*	-.044*	1				
(4) LTDwin	-.348*	-.143*	.694*	1			
(5) STDwin	-.244*	.112*	.618*	-.158*	1		
(6) LOGSZwin	.082*	-.032*	-.224*	-.06*	-.267*	1	
(7) LIQwin	.076*	-.03*	-.217*	.096*	-.382*	0.018*	1

* indicates significance at the 1% level. All variables are defined in Table 2

with long-term debt (L*TDwin,* -.35) and short-term debt (*STDwin,* -.24) that are all significant at a 1% level. Furthermore, low positive correlations have been observed for size (.08) and liquidity (.08) that are also significant at a 1% level. We see that SMEs with a high ROA use less debt to finance their business activities and investments.

For ROCE a low negative (-.04), but significant at the 1% level, correlation was found with total leverage (*TDwin*). However, a moderate negative correlation (-.14) was found for long-term leverage (*LTDwin*) and a moderate positive correlation (.11) was found for short-term leverage (*STDwin*), which both are significant at the 1% level.

For both control variables a low negative correlation was found, (*LOGSIZEwin,* -.03 and *LIQwin,* -.03) that is significant at the 1% level. Here it can be seen that profitable SMEs that efficiently use the employed capital prefer the use of short-term obligations over the use of long-term obligations.

Moreover, it can be observed that a high positive correlation was found for the proxies of capital structure. Subsequently, leverage (*TDwin*) and the ratios for long-term debt (*LTDwin*) and short-term debt (*STDwin*) show high positive and significant correlations .694 and .618 respectively, which can be expected by definition, as the overall leverage ratio includes all the debt positions of a firm. The long-term debt ratio and the short-term debt ratio are significantly negatively correlated (-.16).

The control variables size and liquidity show a low positive correlation (.02) to one another, which is significant at the 1% level.

Following Wooldridge (2012), a Durbin-Watson test was performed to check for autocorrelation, which showed that autocorrelation was not detected for any model. Furthermore, for multicollinearity the variance inflation factors (VIF) have been calculated, where a VIF exceeding 10 is indicating multicollinearity (Wooldridge, 2012). The VIFs in all models have been slightly above 1, which indicates that multicollinearity is not a problem. Following the normality assumption, histograms (see Appendix 1) have been created for the residuals of each model. The histograms of the residuals indicate a normal distribution for all models.

4.3 Regression Analysis

Two alternative proxies are used to measure performance and the results are presented in different model specifications. Model 1 uses ROA as a proxy for performance. Moreover, the proxies for capital structure are the following. Model 1a uses total leverage ratio (*TDwin*), and Model 1b uses the sum of the ratios for long-term leverage (*LTDwin*) and short-term leverage (*STDwin*) as a proxy for capital structure. In comparison, Model 2 uses ROCE as a proxy for performance. The underlying sub-configuration into 2a and 2b are corresponding to the proxies for capital structure as above described for Model 1. Moreover, to investigate the effect of the financial crisis, the panel was divided into two sub-panels. The first sub-panel is considered as the crisis period from 2008 to 2011 and the second sub-panel is considered as post-crisis period from 2012 until 2015.

4.3.1 Overall Effect of Capital Structure on Performance

The regression coefficients reported for all proxies of capital structure (*TDwin, LTDwin* & *STDwin*) in Model 1 are moderately negative and show that SMEs that use debt to finance their business activities and investments are less profitable. Moreover, all the regression coefficients for capital structure are highly significant at the 1% level. The coefficients for the control variables display mixed results. In Model 1a, the coefficient for size reports a positive and highly significant (at 1% level) relationship between size and performance, meaning that larger SMEs tend to be the ones that are more profitable. In comparison, the coefficient for size in Model 1b showed a minimally smaller positive relationship that is however, significant at the 5% level. The regression coefficient for liquidity was slightly below zero in both models, however, in Model 1a the coefficient is not significant, whereas in Model 1b it its highly significant at the 1% level. In addition, the dummy variable for the financial crisis (*dumCrisis*) showed a low positive relationship to performance, where the values for both sub-configurations are highly significant at the 1% level. Eventually, following the adjusted R-squared, 49% of the variation of performance can be explained by Model 1a and 54% of the variation of performance can be explained by Model 1b. The results for the total leverage (-.064) and long-term leverage (-.051) show a larger negative relationship compared to SMEs in the UK (Abeywardhana, 2015). In contrast, the results for the short-term leverage ratio suggest a positive relationship (.064) for SMEs in the UK (Abeywardhana, 2015),

Table 5: Regression Analysis

	Full Panel			
	Model 1a	Model 1b	Model 2a	Model2b
TDwin	-.134*** (-42.26)		.04** (2.28)	
LTDwin		-.134*** (-25.43)		-.131*** (-4.70)
STDwin		-0.184*** (-31.66)		.299*** (9.70)
LOGSZwin	.015*** (4.03)	.011** (2.13)	-.075*** (-3.54)	-.015 (-.58)
LIQwin	-.000 (-.76)	-.001*** (-3.4)	-.006*** (-3.08)	.003 (1.19)
dumCrisis	.005*** (3.43)	.007*** (4.07)	.037*** (4.63)	.039*** (4.66)
Constant	.065*** (4.03)	.104*** (4.87)	.409*** (4.60)	.044 (.39)
Observations	20,850	16,577	20,084	15,978
R^2	.573	.630	.352	.404
Adjusted R^2	.491	.538	.221	.248
	Crisis Period (2008-2011)			
	Model 1a	Model 1b	Model 2a	Model 2b
TDwin	-.15*** (-24.73)		.039 (1.07)	
LTDwin		-.15*** (-15.32)		-.212*** (-4.02)
STDwin		-.184*** (-18)		.322*** (5.76)
LOGSZwin	.032*** (4.71)	.035*** (4.02)	-.132*** (-3.37)	-.016 (-.35)
LIQwin	.001 (1.47)	-.000 (-.59)	-.006* (-1.91)	.004 (1.03)
dumCrisis				
Constant	.01 (.36)	.012 (.33)	.673*** (4.08)	.095 (.48)
Observations	10,167	8,366	9,415	7,776
R^2	.674	.707	.533	.57
Adjusted R^2	.534	.557	.31	.327
	Post-Crisis Period (2012-2015)			
	Model 1a	Model 1b	Model 2a	Model 2b
TDwin	-.151*** (-28.26)		-.013 (-.43)	
LTDwin		-.156*** (-16.25)		-.161*** (-3.02)
STDwin		-.206*** (-20.24)		.307*** (5.44)
LOGSZwin	.034*** (4.97)	.024*** (2.80)	-.003 (-.09)	-.023 (-.47)
LIQwin	-.000 (-.92)	-.000 (-.57)	-.005* (-1.65)	.004 (1.06)
dumCrisis				
Constant	.006 (.21)	.066* (1.8)	.166 (1.04)	.076 (.37)
Observations	10,683	8,211	10,669	8,202
R^2	.693	.746	.454	.495
Adjusted R^2	.563	.612	.226	.23

***, **, * indicates significance at the 1%, 5% and 10% level respectively.
All variables are defined in Table 2.

whereas a negative relationship for Dutch SMEs.
The regression coefficients for Model 2a, which uses ROCE as a proxy for performance, reported a low positive (.04) and significant (at the 5% level) relationship between leverage and performance. In contrast, Model 2b reported highly significant relationships that are negatively for the long-term debt ratio (-.131) and positively for the short-term debt ratio (.299). Generally, this showed that SMEs that increased their leverage in order to finance their business activities and investments were performing better. However, Model 2b revealed long-term debt instruments harm business performance, whereas short-term debt positions are performance enhancing. The regression coefficients for size are negative for both sub-configurations of Model 2. Albeit size is highly significant at the 1% level in Model 2a it is being insignificant in Model 2b. Mixed results were found for liquidity, which show a low, negative and highly significant (at the 1% level) relationship in Model 2a, whereas an insignificant, positive relationship is found in Model 2b. Thus, larger and liquid SMEs tend to perform inferior to smaller and less liquid ones following Model 2a. The dummy variable for the financial crisis shows again low positive relationships in both sub-configurations that are highly significant at the 1% level. Nevertheless, the adjusted R-squared for Model 2 is lower compared to the ones of Model 1. Thus 22% of the variation of performance can be explained by Model 2a and 25% of the variation of performance can be explained by Model 2b. In comparison, findings from SMEs in the UK show a negative relation (-.031) between total leverage and performance (Abeywardhana, 2015), whereas the relationship for Dutch SMEs is slightly positive as described above. The regression coefficients for the long-term leverage (-.059) and short-term leverage (.047) in the UK (Abeywardhana, 2015) show relations with similar signs compared to SMEs in the Netherlands.
It was found moderate but statistically highly significant evidence to support H1b. Subsequently, levered SMEs are less profitable, which is in line with previous research (Abeywardhana, 2015). In contrast, H1a following the trade-off theory was rejected.
The results show mixed results for H3. Following Model 1, with ROA as a proxy for performance, H3 can be confirmed as the results suggest a significant but low positively relationship between size and performance. However, Model 2 is rejecting H3, as the results show a low negative relationship between size and performance, that is only significant when using the overall leverage ratio as proxy for capital structure (Model 2a). H4 suggests a negative relationship between liquidity and performance. A weak negative and statistically significant relationship for supporting the hypothesis is found in Model 1b and 2a. However the results are inconclusive.
The different signs and strengths of the relationships for performance can be explained in the variables of their calculations. ROCE compared to ROA, uses EBIT where interest and tax payments have not been deducted from the earnings.

4.3.2 Changes in the Effect of Capital Structure on Performance During and After the Financial Crisis

The results for Model 1 report low or very low changes for the regression coefficients of the proxies for capital structure. The relationship between the overall leverage ratio and performance remained basically the same. However, the coefficient for the long-term debt ratio is minimally more negative in the post-crisis period compared to the crisis. The coefficient for the short-term debt ratio is also slightly more negative in the post-crisis compared to the crisis. All regression coefficients for the proxies of capital structure are highly statistically significant at the 1% level.
These results show that the effect of short-term debt on performance is slightly more negative in the post-crisis period than during the crisis.
The coefficients for size basically remain the same in Model 1a and slightly decrease in the post-crisis period in Model 1b. It is to be noted that all coefficients for size are significant at either the 1% or 5% level. The liquidity of SMEs stays at a very low level throughout both models and time periods. Moreover, all regression coefficients for liquidity are insignificant. Model 1a can explain 53% of the variation in performance during the financial crisis and 56% during the post crisis period. In comparison, Model 1b can explain 56% of the variation of performance during and 61% after the financial crisis.
Model 2 shows mixed results for the regression coefficients of capital structure. The total leverage ratios are statistically insignificant for both sub-configurations and change from being slightly positive during the crisis to being slightly negative in the post crisis period. The proxy for the long-term debt ratio slightly increases in the post-crisis period compared to the crisis. Both of the coefficients for Model 2a and 2b are statistically significant at the 1% and 5% level. Similarly, the proxy for the short-term debt ratio slightly decreases too. Also both coefficients are highly significant at the 1% level. The coefficients for the proxies of the control variables size and liquidity remain basically the same and are both insignificant for all points of measurement. Compared to Model 1, the second model can explain less variation in performance. Model 2a explains 31% of the variation during the crisis and 22% in the post-crisis, while Model 2b explains 33% during the crisis and 23% in the post-crisis.

Given the inconclusive results of the fixed-effects regression for both models H2 can neither be confirmed nor rejected.

5 SUMMARY AND CONCLUSION

5.1 Summary of the Context

SMEs are a major contributor to national economies (Muller et al., 2016) but are however, disadvantaged to large and publicly listed companies in terms of access to finance. SMEs have to cope with strategic capital structure choices, where bank loans serve as the main source of external finance to them (Petersen & Rajan, 1994). This in turn, makes SMEs dependent on banks that are granting loans based on the availability of funds and the solvency of the debtor. Therefore this bachelor thesis investigates the effect of capital structure on SME performance in the Netherlands. Both for capital structure and for performance, different proxies have been used to construct and test different theoretical models. The dataset entails 3,363 SMEs for the time period of 2008 until 2015. SMEs were defined according to the EU-definition.
The long time frame of eight years and the large sample enabled a statistically reliable judgement as well as the opportunity to control for changes during the financial crisis compared to the post-crisis period. The main theoretical concepts that were used are the trade-off theory and the pecking order theory. Briefly, the trade-off theory claims that corporations have an individual target debt ratio, where the benefits of tax shields and the costs associated to debt are in balance (de Jong, Verbeek & Verwijmeren, 2010; Modigliani & Miller, 1963; Hiller et al., 2014). In contrast, the pecking order theory suggests that corporations prefer internally generated funds over external sources of finance due to the related costs of information asymmetries (Harrison & Wisnu Widjaja, 2014) and moreover, that corporations do not have a target debt level (Hiller et al., 2014).

5.2 Summary of the Results

Two models have been created and were performed in a fixed-effects regression model, which is in line with previous research (among others: Degryse, de Goeij & Kappert, 2012). Model 1 uses Return on Assets and Model 2 uses Return on Capital Employed as a proxy for performance. Both models have been further divided into the sub-configurations a and b, where a uses the overall leverage ratio as a proxy for capital structure and b the combination of the ratios for long-term and short-term debt.

The results showed that almost all proxies for financial leverage (*TDwin, LTDwin* & *STDwin*) contained in this study have a statistically negative relationship with the measures of SME performance (*ROAwin* & *ROCEwin*).

Moreover, the multivariate analysis included the control variables size (*LOGSIZEwin*) and liquidity (*LIQwin*). The results for size are mixed and show low positive relationships in Model 1 that are statistically significant. In contrast the results for Model 2 suggest a negative sign and significance is found only for Model 2a. The results of the effect of size on performance prove to be inconclusive.

In addition, liquidity shows a considerably low relationship to the proxies of performance. It is to be noted that this relationship is negative but insignificant in Model 1a, whereas the relationship is negative and significant at the 1% level in Model 1b. For Model 2a liquidity shows a low negative relationship to performance that is significant at the 5% level and shows a low positive relationship in Model 2b that is insignificant. This shows that the impact of liquidity on performance is inconclusive.

Eventually, the results showed that the financial crisis hat a minor effect on the relationship between the proxies of capital structure and performance.

5.3 Conclusion

To conclude, the results support the pecking order theory, as the relationship between capital structure and performance is negative in Model 1, which better explains the variation in performance than Model 2. The first model proved to be a more precise predictor of the variation of performance compared to Model 2, as the values for adjusted R-squared are generally in a range between 50% and 60%. Moreover, inconclusive results were found for the change in the effect of capital structure on firm performance during and after the financial crisis. However, size and liquidity are not necessarily statistically significant control variables for performance.

5.4 Limitations

The obtained public data from Reach covers relatively few statements about small firms, as they are not obliged to reveal balance sheet data (Degryse, de Goeij & Kappert, 2012). This might lead to a small sample, which might not be representative and hence cannot be generalized. Moreover, different results may occur for the different industrial branches.

Furthermore, a common threat of panel studies is panel attrition, meaning that the data might change over time due to the fact that respondents – in this case the firms analysed – drop out of the study (Babbie, 2010). Hence, firms could have reported their balance sheets in one year and might have stopped to do so later, since it is not mandatory for unlisted SMEs to publish their annual reports. This might lead to unbalanced data. This threatens the external validity of the study, since the outcome will most probably not remain the same when a change in respondents is present (Campbell, Graham & Harvey, 2002). However, this limitation can be controlled by only analysing firms, which have reported data for at least three years and excluding those firms, which have less data points in their annual reporting.

Next to the pecking order theory and trade-off theory, capital structure is explained by other theoretical approaches as the agency theory, for instance. However, due to the limited time frame and resources of a bachelor thesis the focus of this research is only on the two theories mentioned above.

Moreover, the results have not been analysed on an industry-level to detect possible industry effects. However, there might be variations in the average leverage ratios across different industries (Degryse, de Goeij & Kappert, 2012). This would be a subject for further investigation. Moreover, other control variables might appear to be better predictors for performance than the ones chosen for this thesis.

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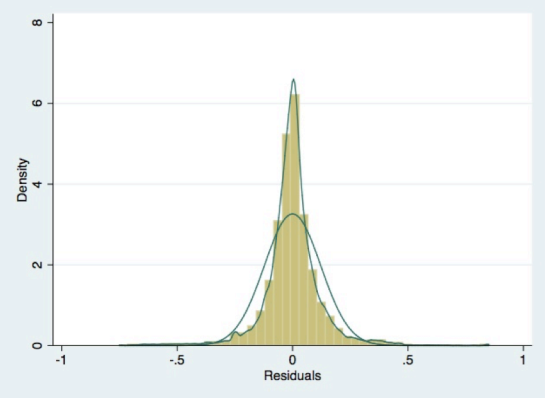
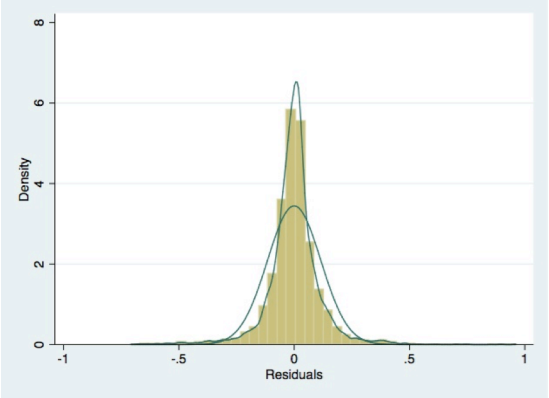
8. APPENDIX

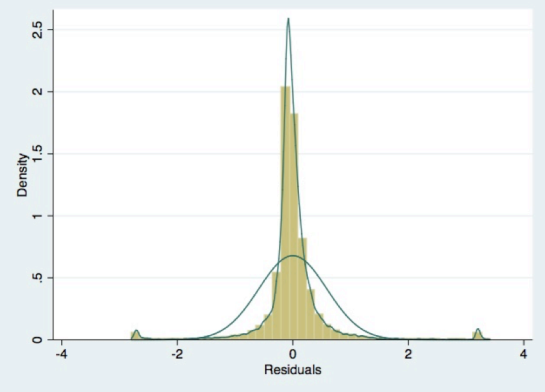
8.1 Appendix 1



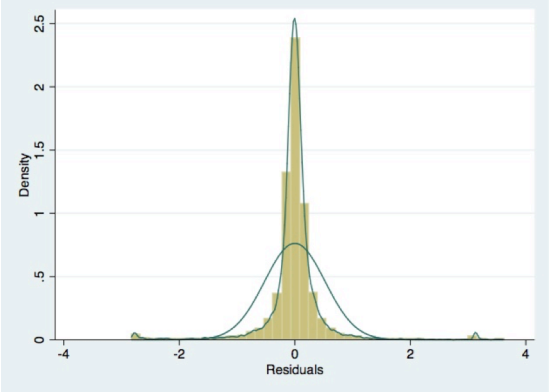
Graph 1: Distribution of Residuals for Model 1a



Graph 2: Distribution of Residuals for Model 1b



Graph 3: Distribution of Residuals for Model 2a



Graph 4: Distribution of Residuals for Model 2b