Capital structure influence on firm's financial performance: differences in public and private firms, evidence from the Netherlands

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ABSTRACT,

This paper investigates the influence of capital structure measured by total debt, long-term debt and short-term debt on private and public firm's financial performance measured by ROA and ROE, and then checks if there is a difference between these relationships. Fixed effect regression was used to investigate the relationship. Capital structure was found to influence performance positively, except for short-term debts influence on ROA in the case of public firms and long-term debts influence on ROA in the case of private firms. There was no statistically significant difference found of the influence of the capital structure on performance between public and private firms, except for the influence of the long-term debt.

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1. INTRODUCTION

Capital structure is a mix of securities and financing sources used by companies to finance their real investment (Myers, 2001). Why is research on the right side of the balance sheet is so diverse and important? The first paper that proposed a structured theory about capital structure is "The cost of capital, corporation finance and the theory of investment" by Modigliani and Miller (1958). It concludes that the capital structure of the firm has no influence on the firms' value. However, a vast body of evidence suggests that the proportion of debt has an impact on company's performance and behavior (Jensen, 1976; Myers, 1984; Stiglitz, 1988).

The failure of these assumptions led to the rise of different theories on capital structure. The idea of the debt tax shield (Modigliani and Miller, 1963) arises from the fact that leverage is tax-deductible. Therefore debt provides benefits for the firm by shielding earnings from taxation. This adjustment of the original theory led to the unrealistic proposition that the firm has to finance primarily by leverage, which was because the proposition did not account for the cost of debt. Kraus and Litzenberger (1973) created the trade-off theory, which postulates that firm's benefit from tax shield is offset by costs of debt. Therefore, they assume that an 'optimal' capital structure can be found after accounting for market imperfections such as taxes, bankruptcy costs and agency costs. Myers and Majluf (1984) originated the pecking order theory, which is based on information asymmetry. The theory imposes a strict hierarchy on financing by suggesting that choices for financing sources follow this order: internally generated funds, debt, new equity issue. This is due to the higher cost of each of the following funding source caused by the increased information asymmetry. The last fundamental theory of capital structure is agency cost theory (Jensen, 1976). IT is based on the premise that the interest of the company's managers and its owners are not always aligned. The theory explains the relationship between the principal, owners of a firm, and the agent, management of the firm, in the decision-making process regarding the firm's capital structure. Jensen and Meckling (1976) indicate that in the decisions about a firm's capital structure are affected by the agency conflicts between shareholders and managers, which in turn affects the performance. This paper focuses on the agency cost theory, due to its ability to explains the relationship between capital structure and performance.

Capital structure decision is important, because it influences the financial performance and value of the firm, involves significant amounts of money and has long-term implications for the firm. A body of research investigates the influence of capital structure on firms' performance (Ahmad, 2012; Majumdar, 1999; Vatavu, 2015; Abor, 2007; Gleason et. al, 2000; Madan, 2007; Zeitun, 2007). Due to the lack of agreement on what constitutes an optimal capital structure, it is standard practice to research the influence of leverage on companies' performance. The studies found mixed results. Some find a strong positive relationship between debt and performance (Ahmad, 2012; Abor, 2005), other discover a strong negative relationship (Vatavu, 2015; Gleason et. al, 2000; Agarwal, 2001). More research on different samples is needed to identify the true relationship.

Most research on capital structure has focused on public, non-financial corporations with access to U.S. or international capital markets (Myers, 2001). This led to a gap in the empirical research on private, non-US firms. Private firms, being non-listed firms, whereas public firms are the firms which are listed on stock exchange. Private firms' performance is undeniably important for the economy of the Netherlands. Private firms constitute 99% of the firms in the Netherlands in number, according to REACH.

Previous research on capital structure and performance of private and public firms identified a difference in both performance and capital structure of private firms, compared to public firms. Akguc (2013) found that performance of private firms is better, compared to public firms. According to Brav (2009), private firm's capital structure is heavier on the debt side. Based on these findings, a question arises if the capital structure difference can explain the difference in performance? The goal of this thesis is to analyze the influence of capital structure on the performance of private and public firms and investigate if there is a difference in the impact of capital structure on the firms' performance. Therefore, the research question and sub-questions are as following:

What is the influence of the capital structure on the performance of public and private Dutch firms and is there a difference between them?

1. What is the influence of the capital structure on the financial performance of public firms?

2. What is the influence of the capital structure on the financial performance of private firms?

3. Is there a difference between the two impacts?

The importance and relevance of this study are two-fold. Firstly, it has undeniable academic importance because it will shed more light in the form of empirical evidence onto the obscure nature of private firms. It will take the challenge of explaining the previously observed differences in performance with the variances in the capital structure. Secondly, the practical relevance of this research will be grounded in the support to managers and firm owners in their capital structure decisions. If there is indeed a significant relationship between the capital structure of private firms and their performance, then this information has definitive practical relevance.

The second section of this paper conducts a literature review on capital structure, performance, differences in public and private firms and empirical evidence on the influence of capital structure on performance. In the third section, hypotheses are formulated. Data collection and sample are discussed in the fourth section. Methodology for answering the research question is discussed in the fifth section. Sixth section's focus is descriptive statistics, results of the regressions and robustness testing. Conclusions are given in the seventh section.

2. LITERATURE REVIEW
2.2 Capital Structure

Capital structure determines how the company is financing its operations and investments. The capital structure combines various securities, such as equity, debt and hybrid securities (Hillier et al., 2011). Equity is defined as a security that represents ownership interest, such as common stock. Debt is defined as the amount borrowed from one party to another. Debt can be classified by the maturity time: if the maturity of debt is more than 12 months, then it is classified as long-term, such as bond or loan agreements, otherwise, it is classified as short-term, for example as notes or in some cases bank loans. The hybrid securities exhibit the characteristics of both debt and equity, for example, convertibles or preferred stock. This study will focus on the debt in order to measure capital structure, specifically total debt, short-term debt and long-term debt.

2.1.1 Modigliani-Miller Theory

Discussion on the theory of capital structure was started by the fundamental work of Modigliani and Miller (1958). The theory is based on the following assumptions: first, the markets are

frictionless markets, meaning there are no transaction costs; secondly, the markets are competitive, and individuals and firms are price takers; thirdly, individuals and firms can undertake financial transactions at the same prices (e.g., borrow at the same rate; fourth, all agents have the same information; lastly there are no taxes.

These assumptions deductively led to the famously recognized idea of the "capital structure irrelevance" where the debt has no influence on the firm's value under the efficient market assumption. The Modigliani & Miller proposition demonstrates that by taking companies investment policy as given, in the perfect market, without tax, transaction cost and with all of the information, capital structure has no effect on the firms' value. However, each of these assumptions does not hold true in the "real world". Modigliani and Miller realized the limitations of the original model and decided to include taxes into the equation. This resulted in the unrealistic proposition that the firm has to be financed by 99.99% of debt in order to increase its value (Modigliani and Miller, 1963). By just "relaxing" one of the assumptions, it is evident that capital structure is important for a firm's value. In the case when all the assumptions are realistic, capital structure has an influence on the value of a firm.

2.1.2 Agency cost theory

Jensen and Meckling (1976) developed agency cost theory. Agency costs are described as the total of the monitoring expenditures by the principal, bonding costs by the agent, and a residual loss. Agency problem arises because of the conflicts either between managers and firm owners (agency cost of equity) or between firm owners and debt holders (agency costs of debt).

According to agency theory, there are several problems that are connected to debt. The first one is referred to as an overinvestment problem or ''free cash flow theory''. Due to the separation of ownership and control managers are more inclined to maximize their utility, rather than act in the interest of the firm. As Jensen (1986) specified ''the problem is how to motivate managers to disgorge the cash rather than investing it below the cost of capital or wasting it on organizational inefficiencies." Debt capital is argued to be a way to control agency cost. In this case, leverage will act as a corporate governance mechanism and will force managers to pay out the required interest payments by performing and generating cash. According to Gansuwan & Önel (2012), debt serves as a way to encourage managers to align their actions with the interests of shareholders by constraining the managers. Thus interest payments will reduce the amount of available cash flows for managers to spend on empire building or other projects with negative NPV (Jensen, 1986). Another implication of greater financial leverage is that it may affect managers and reduce agency costs through the threat of liquidation, which causes personal losses to managers of salaries, reputation, perquisites (Grossman and Hart, 1982). Therefore, the theory postulates that high amount of debt contributes to reducing firm's agency costs and provides mitigation of agency conflicts.

The second problem is referred to as a risk-shifting problem. This issue appears in circumstances where managers have motivations to take excessive risks. Since the upper bound of the return gained by debt holders is fixed by the interest rate of the debt and the upper bound of return for equity holders is virtually limitless, managers are inclined to take riskier projects to strive for higher upside. The debtholders are deprived from this potential abnormal return and bear just the cost of the risk. This leads to another implication of agency cost of debt, the investment in riskier projects by equity holders at the expense of the debt holders (Jensen, 1976).

The last problem is the underinvestment phenomena. Managers or owners may choose not to invest into projects which mainly provide benefits to the debtholders. When investment is debt financed, an incentive problem arises as project's return has to be divided between owners and bondholders. Whenever shareholders do not get desired return, then positive NPV projects may be not taken, which leads to decrease in overall performance (Myers, 1977).

2.2 Performance

There is no consensus in the literature about the definition of firm's performance (Kirby, 2005). For the purpose of this research, firm's financial performance is defined as objective accounting performance (Richard, 2009). This approach is widely recognized and used. Its validity was found to be high since the correlation between accounting and economic return was above 75% (Danielson and Press, 2003). On average, 53% of researchers in Academy of Management Journal, Administrative Science Quarterly, Journal of International Business Studies, Journal of Management and Strategic Management Journal use objective accounting performance measures to measure organizational performance (Richard, 2009). This approach is not without limitations since they are, firstly, prone to human error; secondly, are highly dependent on the accounting standards; thirdly, rely on the past, rather than focusing on the future. These issues will be solved by winsorizing the data to exclude outliers that might have been there due to error; only one country is used for the analysis in order to assure that all the companies are regulated by the same accounting guidelines; and cross-sectional time-series design is adopted to get an insight into behaviour of the accounting performance measures over time.

This paper will focus on two performance proxies return on equity (ROE) and return on assets (ROA). ROE indicates the performance of a company by scaling its income to its shareholders' equity. ROE measures how much return the shareholders get for their investment in the company. The higher the ratio percentage, the better is the investor's return. ROA indicates the performance by measuring the income of a company relative to its total assets. ROA ratio provides a total return made by the company, irrespective of the financing source (Murphy, 1996).

2.3 Private and public firms

In this research, public firms are defined as firms, that are quoted on stock exchange and private firms are the firms that are not listed on any stock markets. This distinction leads to the fundamental differences between private and public firms. Access to the capital market has its consequences for different aspects of the firm.

The ownership of private firms is more concentrated, compared to public firms (Mayers, 1991), therefore, the owners of the private companies have a higher degree of control over the firm. However, in public firms, due to the higher diffusion of ownership and higher agency costs between the management and the ownership, it is characteristic for the managers to dilute any control from single shareholders by issuing more equity. Therefore, agency costs are higher in the public firms and overinvestment problem is more vivid (Morellec, 2004).

Due to the fact, that minority shareholders in private companies have less protection and disclosure, compared to the public companies, they are more reluctant to purchase private equity. Thus private equity becomes more expensive. Cost of equity is higher in private firms since they are less transparent and value of equity is harder to estimate, therefore, it sells at a premium, compared to debt. This leads to increased probability that the

private firm will have higher debt than a public firm (Brav, 2009).

Another implication is that the maturity structure of debt is different for private and public firms. Private firms use short-term debt in their capital structure more often (Brav, 2009). This is explained by the fact that access to the long-term debt markets is associated with much higher flotation costs. Therefore long term debt is less accessible to the private firms (Marsh, 1982). As well, public firms are more likely to reach for goals with shorter term, due to pressure from myopic investors to generate short-term profits (Stein ,1989; Acharya, 2013).

2.4 Empirical evidence

A body of research investigates the influence of capital structure on firms' performance (Ahmad, 2012; Majumdar, 1999; Vatavu, 2015; Abor, 2007; Gleason et. al, 2000; Berger and Bonaccorsi di Patti, 2006; Margaritis and Psillaki, 2007). Summary of their papers, including their dependent, independent and control variables, relationships found and samples can be found in Table 1.

As can be seen, the studies found mixed results. Some find a strong positive relationship between capital structure and performance (Ahmad, 2012; Abor, 2005, Berger, 2006;

Margaratis, 2007), some discover a strong negative relationship (Vatavu, 2015; Gleason et. al, 2000; Majumdar, 1999).

This literature review provides aid in choosing the variables for this study. One can observe that the most popular chosen variables in the literature for this type of studies: total debt (TD), short-term debt (STD) and (long-term debt) LTD as independent variables; ROA and ROE, as dependent; size, sales growth, asset growth, efficiency and risk, as control variables.

3. HYPOTHESES

In pursuance of answering the research question and sub-questions hypothesis will be developed based on the theory. To predict the influence of leverage on performance, it will be investigated how leverage performs in all of the agency theory problems. Then the implications for private and public firms will be discussed, and finally, the possible differences will be investigated.

The overinvestment problem deals with empire building and on-job consumption and spending inefficiencies in general. These inefficiencies have negative influences on performance. Debt is argued to decrease them by setting periodical obligatory interest payments which discipline the management. This discipline is argued to increase performance since it prohibits unnecessary investments and creates an obligation to pay interest, which will motivate the management. These arguments apply to public firms since there is a clear divide between managers and owners.

Table 1. Empirical literature review summary

Name of the author, year	Dependent variable	Independent variable	Control variable	Found relationship	Sample size, years, country
Berger and Bonaccorsi di Patti (2006)	PE	TE	OS, market concentration, SZ, RK, the regulatory environment	+	695, 1990-1995, USA
Margaritis and Psillaki (2007)	PE	TD	Profitability, SZ, asset structure, growth, OS and O type	+	6124, 2005, New Zealand
Umar et. Al (2012)	EBIT, ROE, ROA, EPS, P/E	STD, LTD, STD	SZ	-	63, 2006-2009, Pakistan
Salim and Yadav (2012)	ROA, ROE, Tobin s Q, EPS	LTD, STD, TD, GS	SZ	- STD, LTD and TD. + Tobin's Q, GS	237, 1995-2011, Malaysia
Ahmad, Abdullah & Roslan (2012)	ROA, ROE	STD, LTD, TD	SZ, GA, GS and efficiency	+	58, 2005-2010, Malaysia
Vatavu (2005)	ROA, ROE	STD, LTD, TD, TE	Asset tangibility, tax, RK, liquidity and inflation	-	196, 2003-2010, Romania
Abor (2005)	ROE	STD, LTD, TD	SZ, GA	+ STD, TD. - LTD	22, 1998-200, Ghana
Gleason (2000)	ROA, profit margin, growth in sales, SPE	TD	Economic environment, culture cluster, sales, Herfindal concentration index, fixed assets	-	198, 1994, 14 EU states
Majumdar and Chhibber (1999)	ROE	Debt to Equity	SZ, age, diversity, group, foreign or not, exports, advertising, distribution, marketing, capital intensity, inventory, liquidity, GS, excise, import, time	-	1043, 1988-1994, India

Profit efficiency (PE), Return on equity (ROE), Return on assets (ROA),Sales per employee (SPE), Ratio of equity capital to gross total assets (TE), Ratio of total debt to total assets (TD), Ratio of long term-debt to total assets (LTD), Ratio of short term-debt to total assets (STD), Ownership structure (OS), Size (SZ), Risk (RK), Growth in assets(GA), Growth in sales (GS), Significant positive relationship (+), Significant negative relationship (-)

However, overinvestment problem also applies to the private firms. It, without a doubt, applies in the cases where management is present, hence the owner is not the manager. But it also applies to the cases where the owner is the manager. Although owners of private firms have their interests perfectly aligned with themselves, they can still produce many inefficiencies, such as paying themselves or their families higher wages or enjoy on-job consumption (Feldman, 2005). Therefore, we can predict that in case of overinvestment problem debt has a positive influence on performance, both in private and public firms.

Secondly, underinvestment problem deals with the reluctance of owners to invest in positive NPV projects, returns on which must be shared with debtholders. This leads to a negative impact on growth (since investment opportunities will be missed) as well as on overall performance of the firm. The existence of this problem predicts that leverage will have a negative impact on total performance i.e. ROA, but positive impact on return of the owners, i.e. ROE. The direction of influence is the same for public and private firms. In conclusion, according to the agency theory (Jensen, 1976), debt has a positive impact on both private and public firm's performance.

Hypothesis 1. Leverage has a positive influence on the performance of private firms.

Hypothesis 2. Leverage has a positive significant influence on the performance of publicly listed firms.

As for the difference in the influence of debt on performance between public and private firms, the following can be argued. Since for both, private and public firms, the predicted direction of influence of leverage on performance is the same, we assume that there is no difference.

Hypothesis 3. *There is no difference in the influence of leverage on the performance between private and public firms.*

4.DATA

To assess the impact of capital structure on the performance both in private and public firms, a dataset, obtained from several sources, was created. The data on public firms were obtained from ORBIS database, whereas data on private firms were obtained from REACH database. Both databases are provided by Bureau van Dijk (BvD), one of the largest providers of business data. ORBIS data are mainly on large and very large companies from around the world. From this dataset sample of the Dutch publicly listed firms was acquired. REACH is a database that contains information on almost all Dutch companies, including private entities, from which our sample was obtained. Period of 2010-2016 was chosen for the research because both databases store data only up to 10 years. In order to calculate the variable of risk, which requires 4 years of data, our sample had to be started from 2010, because 2007 is the last available year. Both samples were collected with the same search strategy. Firstly, they must be either Unlisted for the case of private firms, either Listed or Delisted, for the case of the public. Secondly, financial and governmental industry sectors were excluded, because the nature of the operation and accounting reporting is intrinsically different from the other industries, moreover, their capital structures are governmentally regulated (Brav, 2009). Thirdly, Private limited liability organization (B.V.) and Public limited liability organization. Lastly, firms which satisfied Dutch auditing requirement of having 6 million euros in total assets for two consecutive years. The choice of types are analogs to the choice of types Brav (2009) chose to use in his comparison of public and private firms. This resulted in 1476 private companies and 217 public companies, which amounted to 10332 and 1514 firm-year observations respectively. In order to clear the data

from outliers, observations were winsorized at the 2.5 and 97.5 (Akguc, 2012).

For answering the third research question a matched sample of public and private firms is constructed for the sake of comparability. Each public firm is matched to private firms based on two-digits SIC industry code and size. The procedure follows Asker, Farre-Mensa and Ljungqvist (2014) and the size match condition is that no firm will be matched to a firm twice as large or small, measured by average total assets, which is mathematically defined as max{Total Asset (public), Total Asset(private)} / min{(Total Asset (public), Total Asset(private)} < 2. The procedure resulted in 55 matched pairs.

5.METHODS

5.1 Variables.

The dependent variables to measure performance will be ROE and ROA. Capital structure will be operationalized as short-term debt, long-term debt and total debt. In order to provide significant results, five control variables were identified. These variables, according to the literature, have the highest influence on financial performance. They are size, asset growth, sales growth, efficiency and risk.

Performance variables: ROE and ROA

Financial performance is a measure of how well a firm can use its assets to generate revenue. Most often in the research Return on Assets and Return on Equity are used as an indication of firm's performance (Majumdar,1999; Ahmad,2012; Sambharya,1995; Mathur, 2001; Vatavu, 2015; Salim ,2012; Gleason et. al ,2000). Although, Tobin's Q and stock market returns are often used as well, they are not applicable to this research, because the object of our interest is private firms, which do not have these market base performance measures available.

As for the measurement of ROA and ROE there is no clear agreement in the literature. Some use Net income (Ahmad, 2012; Mathur et. Al,2001; Abor, 2007; Akguc, 2012; Salim, 2012; Vatavu,2015) , while others employ EBIT (Akguc, 2012; Brav, 2009; Asker, 2014; Abor, 2005; Ahmad, 2012). The basic difference between EBIT and Net Income is the addition of financial income and expenses and taxes. Net Income provides an idea about the company's performance as a whole, whereas EBIT indicates operational performance. Both Net Income and EBIT will be used in this research, but for the sake of clarity EBIT models will be used only for robustness check and they will be reported in the appendix. Therefore, ROA is calculated as net income divided by total assets whereas for ROE, it is calculated as net income divided by total equity.

Explanatory variables: short-term debt and long-term debt

Following the previous literature, financial leverage will be measured as short term debt, long term debt and total debt (Ahmad, 2012; Abor,2007; Saedi,2009; Ebaid, 2009; Salim ,2012; Chen and Hammes, 2003; Leary and Roberts, 2005). Book values of leverage will be used for the variables, since market values for private firms are not observable. Use of book values for public firms is necessary for comparison purposes. Use of book values is in line with Rajan and Zingales (1995), Sbeiti (2010), Leary and Roberts (2005) and Brav (2009). The leverage in this research is defined as: short-term: book value of short-term debt to total assets; long-term debt: book value of long-term debt to total assets; total debt: total debt to total assets. To constraint possible endogeneity problems, explanatory variables will be lagged for one year (Brav, 2009).

Control variables: size, growth in sales, growth in assets, efficiency and risk.

Five variables that are identified to be used most often in these types of studies and influence the performance the most are included in this study as control variables. Size will be measured as the log of total assets (Salim,2012). Growth in assets measured by annual growth rate of total assets (Mafhuzah, 2012). Growth in sales is measured by growth in operating revenue from time t-1 to time t (Akguc, 2013; Ahmad, 2012). Efficiency is measured as asset turnover and is measured as operating revenue over total assets (Mathur, 2001) Risk is measured standard deviation of return on assets for 4 years. (Titman and Wessels , 1988).

5.2 Model

In order to explain and understand the influence of the capital structure on public and private firm's performance, cross-sectional time-series data analysis will be used, which is also called panel data. The panel method is used, because the sample has data across different firms and over seven years. The regression model can be specified as follows:

$$y_{i,t} = \beta_0 + x'_{i,t-1}\beta + z'_{i,t}\beta + e_{i,t}, \ i = 1...N \ and \ t = 1...7$$

Where $x_{i,t-1}$ is a K-dimensional vector of independent variables and Where $z_{i,t}$ is a K-dimensional vector of control variables , which does not contain an intercept term. $y_{i,t}$ represents the dependent variables and can be either ROE or ROA, depending on the model; independent variables consists of capital structure, which can be either total debt, either long-term debt, either short-term debt. The models are run separately for the samples of private and public firms.

Since the variables are nested in companies and the data is panel data (observations are not independent), a threat to the "independence of residual assumption", thus giving rise to an endogeneity problem (Tomarken and Waller, 2005). To avoid this, fixed-effects model is used. It introduces a firm-specific

Table 3. Descriptive statistics

Panel A. Full sample

Variable		Private						Public					Differences		
	#Obs	Mean	S.D.	Med	Min	Max	#Obs	Mean	S.D.	Med	Min	Max	$\overline{Prv}-\overline{Pub}$	t-statistic	Δ in median
ROANI	8049	0.066	0.094	0.052	-0.184	0.500	1115	0.005	0.186	0.031	-1.430	0.227	0.061***	20.481	0.021***
ROENI	8049	0.203	0.271	0.148	-0.369	0.997	1119	0.209	0.363	0.110	-0.224	0.850	-0.006	-0.652	0.038***
ROAEB	8019	0.088	0.112	0.070	-0.183	0.529	1106	0.031	0.128	0.052	-0.579	0.270	0.057***	15.464	0.018***
ROEEB	8019	0.280	0.348	0.198	-0.327	1.321	1110	0.361	0.494	0.172	-0.104	1.277	-0.081***	-6.881	0.026
TD	10199	0.674	0.268	0.671	0.013	0.981	711	0.601	0.271	0.567	0.009	0.977	0.073***	7.206	0.104***
LTD	7500	0.256	0.240	0.183	0.008	0.839	1060	0.382	0.247	0.390	0.008	0.926	-0.126***	-20.390	-0.207***
STD	10179	0.408	0.261	0.409	0.001	0.891	1067	0.296	0.258	0.301	0.000	0.995	0.112***	10.810	0.108***
SZ	10332	4.464	0.533	4.301	3.831	5.765	982	5.630	0.972	5.646	3.651	7.418	-0.697***	-32.064	-1.345***
GS	4123	0.042	0.184	0.027	-0.371	0.730	927	0.081	0.250	0.035	-0.337	1.278	-0.038***	-5.316	-0.008**
GA	10270	0.053	0.175	0.024	-.251	0.801	1120	0.066	0.250	0.026	-0.345	1.339	-0.013***	-2.255	-0.002
EFF	4543	2.194	1.441	1.934	0.065	5.861	994	1.043	0.747	0.926	0.008	3.096	1.150***	24.464	1.008***
RSK	5921	0.051	0.044	0.037	0.002	0.229	958	0.057	0.075	0.029	0.003	0.528	-0.031***	-14.027	0.008

Panel B. Matched firms

Variable	#Obs	Mean	S.D.	Med	Min	Max	#Obs	Mean	S.D.	Med	Min	Max	$\overline{Prv}-\overline{Pub}$	t-statistic	Δ in median
ROANI	353	0.067	0.092	0.061	-0.184	0.344	242	0.001	0.155	0.032	-1.430	0.227	0.066***	6.418	0.029***
ROENI	353	0.230	0.294	0.156	-0.369	0.997	243	0.230	0.402	0.100	-0.224	0.850	-0.000	-0.024	0.056***
ROAEB	353	0.085	0.113	0.075	-0.151	0.478	242	0.033	0.126	0.051	-0.309	0.270	0.051***	5.224	0.024***
ROEEB	353	0.309	0.389	0.205	-0.327	1.321	267	0.392	0.541	0.157	-0.104	1.277	-0.083**	-2.175	0.048
TD	384	0.660	0.263	0.663	0.013	0.981	195	0.602	0.196	0.625	0.017	0.977	0.058***	5.406	0.038***
LTD	202	0.220	0.183	0.206	0.001	0839	223	0.395	0.220	0.382	0.013	0.926	-0.175***	-13.894	-0.176***
STD	384	0.429	0.261	0.450	.001	0.891	234	0.250	0.226	0.206	0.000	0.906	0.179***	8.678	0.244***
SZ	385	4.928	0.592	4.915	3.831	6.013	217	5.125	0.841	5.209	3.653	7.317	-0.197**	-3.412	-0.294
GS	244	0.057	0191	0.038	-0.371	0.730	219	0.063	0.226	0.029	-0.318	1.278	-0.006	-0.321	0.009
GA	382	0.074	0.192	0.049	-.251	0.801	247	0.070	0.238	0.031	-0.345	1.339	0.004	0.201	0.017
EFF	261	2.056	1.377	1.873	0.065	5.861	230	1.334	0.731	1.251	0.041	3.096	0.721***	7.122	0.622***
RSK	264	0.054	0.045	0.038	0.003	0.229	212	0.082	0.110	0.046	0.004	0.697	-0.027***	-3.666	-0.008

***, **, * represent significance at 1%, 5% and 10% levels, respectively. Differences are calculated as Private-Public. Inferences about the differences in means are taken out via t test and inferences about differences in medians via Two-sample Wilcoxon rank-sum test.

intercept term that could capture specific entrepreneurial skills or other factors innate to the company and not included in the model. The fixed effect models assumption is that the individual specific effect is correlated with the independent variables (Greene, 1991). It is clear how, for example, the management capabilities of the entrepreneur or firm-specific resources are crucial in determining the performance. Another reason to use the fixed-effect model is the Hausman specification test. Although, not reported, it rejected the null hypothesis that the explanatory variables and the firm individual effects are uncorrelated. A fixed-effects model can cope with correlation between explanatory variables and firm effects and therefore it is statistically preferred over Pooled OLS (Greene, 1991).

To answer the third research sub-question and check if there is a differences between coefficients in two linear regressions Chow test is performed (Chow, 1960). It follows the approach of Mclean (Mclean, 2014) and Panousi (Panousi, 2012) who also compared the coefficients of two regressions.

Correlation matrixes can be found in the appendix, Table 4. It can be observed that most cross-correlation values for the independent and control variables are fairly small, which indicates absence of the multicollinearity problem among the variables.

Limitations of this methodology is the use of book values, although it's impossible in this context to get market values for private companies and for comparability reasons, market values for public companies should not be used; it may have possible

endogeneity problems, since firms performance is a known determinant of the capital structure (Titman and Wessels, 1988; Rajan and Zingales, 1995; Fama and French, 2000): it will be attempted to resolve this issue by using lagged explanatory variables and using panel data; it is conducted on the data set, which has 7 years (2010-2016) available.

6.RESULTS
6.1 Descriptive statistics

The full descriptive statistics can be seen in the table 3. The mean of ROA of Public firms is weakly positive being 0.5%, while measuring with NI and 3.1%, while measuring with EBIT. This level of ROA is consistent with Asker's ROA of 6%. The mean of ROE of Public firms is highly positive being 20% and 36%, while measuring with NI and EBIT respectively. These results are skewed by the maximal values of 85% and 127%. This conclusion can be reached by looking at the lower medians of 11% and 17% and high standard deviations of 36% and 49% respectively. These results are in line with Akguc (Akguc, 2012) and Umar (Umar, 2012), who also found ROE to be higher, compared to ROA. However, the ROE in this sample is higher, compared to theirs. As for Total debt, Public companies are highly leveraged, having on average 60% of their capital structure consisting of debt. This result is not skewed since the median is 56%. This result is twice as high as Brav's (Brav, 2009), however it is consistent with Degryse (Degryse, 2010) and Abor (Abor, 2005), who found that debt represents the bigger part of the capital structure in their samples. Long Term Debt is 38%, which is also not skewed. The results are consistent with

Table 5. Results of the fixed effect regression model

	Panel A. Results for full sample											
	Private						Public					
Dependent variable	ROA (NI)			ROE (NI)			ROA (NI)			ROE (NI)		
Independent variable	TD	LTD	STD	TD	LTD	STD	TD	LTD	STD	TD	LTD	STD
	0.041***	-0.032**	0.043***	0.218***	0.056	0.180***	0.063*	0.169***	-0.081**	0.119*	0.131*	0.093
	(2.70)	(-1.98)	(2.91)	(5.11)	(0.52)	(4.31)	(1.84)	(4.41)	(-2.53)	(1.80)	(1.75)	(0.03)
Control variables												
Size	0.039***	0.010	0.040***	0.126***	0.085	0.133***	0.026	0.034	0.036	-0.171**	-0.100	-0.112
	(2.67)	(2.74)	(2.74)	(3.07)	(1.33)	(3.23)	(0.66)	(1.11)	(1.02)	(-2.35)	(-1.55)	(-0.35)
Growth in sales	0.033***	0.056***	0.033***	0.105***	0.125***	0.107***	-0.009	-0.008	-0.028	0.095**	0.087**	-0.066
	(3.61)	(3.65)	(3.64)	(4.11)	(2.49)	(4.20)	(-0.36)	(-0.45)	(-1.33)	(2.09)	(2.10)	(-0.52)
Growth in assets	0318***	0.023*	0.312***	0.059**	0.053	0.053**	0.155***	0.140***	0.169***	0.168**	0.053	0.126
	(3.30)	(5.74)	(3.24)	(2.21)	(1.25)	(1.98)	(4.22)	(5.74)	(6.24)	(2.57)	(1.05)	(0.98)
Efficiency	0.0143***	0.005*	0.013***	0.013	0.012	0.009	-0.153***	-0.112***	-0.053***	0.079	0.029	0.062
	(3.91)	(3.64)	(3.64)	(1.30)	(0.68)	(0.88)	(-5.55)	(-5.29)	(-2.53)	(1.60)	(0.66)	(0.54)
Risk	0.662***	0.590***	0.661***	1.568***	1.568***	1.559***	-4.399***	-0.281***	-0.284***	-0.341**	0.066	0.412
	(14.53)	(10.75)	(14.51)	(12.34)	(8.07)	(12.25)	(-5.47)	(-4.42)	(-4.12)	(-2.38)	(0.50)	(1.37)
constant	-0.219***	-0.220**	-0.220**	-0.670**	-0.349	-0.655**	0.020	-0.135	-0.88	0.982**	0.646**	0.58
	(-3.09)	(-2.21)	(-1.80)	(-3.38)	(-1.11)	(-3.30)	(0.10)	(-0.77)	(-0.46)	(2.54)	(1.78)	(0.32)
within R^2	0.118	0.192	0.159	0.142	0.185	0.131	0.257	0.181	0.21	0.112	0.095	0.067
F statistic	53.78***	42.56***	53.99***	42.56***	14.13***	41.18***	21.82***	22.70***	19.31***	4.34***	2.39**	2.16*
N	3271	1674	3270	3271	1674	3270	507	773	772	506	773	772

p-values are given in parenthesis. ***, **, * represent significance at 1%, 5% and 10% levels, respectively

Degryse (Degryse, 2010) and Brav (Brav, 2009), who find that Public firms have high levels of Long Term Debt. Short Term Debt is 29%, which is lower than LTD and consistent with Brav (Brav, 2009), who assumed that STD is lower than LTD in public firms and with Hall (Hall, 2004), that found similar values in a sample of Dutch companies.

As for private firms, the mean of ROA of private companies is 6% and 8% for NI and EBIT respectively. This mean shows similar values to Akguc (Akguc, 2012). ROE is again higher compared to ROA, being 20% and 28% for NI and EBIT respectively. This difference is consistent with Akguc (Akguc, 2012) and Degryse (Degryse, 2010). Private firms hold 67% of their total assets in debt. This result is close to Degryse's findings. Long-term debt is 25% of the total assets and short-term debt represents 40% of the assets. These findings are consistent with Brav (Brav, 2009), who found that private companies prefer short-term debt in their financing.

For comparison between private and public firms matched sample will be used and a t-test for mean comparison will be done. Private firms have higher ROA by 6% and 5% measured by Net Income and EBIT than public firms in matched sample, which is consistent with Asker (Asker, 2014) and Brav (Brav, 2009) which found that private firms ROA's are higher, compared to public firms. The situation with the difference in ROE measured by Net Income and by EBIT, however, is diametrically opposite. Public firms perform better than the private firms, 8% difference measured by EBIT. This difference between ROA and ROE can be explained by the fact that public

firms' equity is dependent on the market, therefore, when the company performs worse, the equity is worth less and the ROE gets higher. In contrast, private firms do not have such a problem and their equity is not dependent on the market value. TD is higher in private firms by 6%, which is supported by the fact that equity is more expensive for private firms. LTD, however, is by 17% higher in the public firms, compared to the private firms and STD is higher by 17% in the private firms, which could be explained by the fact that private firms have harder access to long-maturity debt markets. All these findings are consistent with Brav (Brav, 2009). As for the difference in control variables, even in matched sample public firms are on average 19% bigger than private firms. In the unmatched sample, that difference amounts to 69%. Private firms are more efficient by 72% and are riskier by 2% than public firms.

6.2 Regression results

Firstly, the discussion of public firm's regression will be done, which will be followed by the discussion of private firm's regressions and lastly, the matched sample regressions will be compared them, using chow test. All of the regression results can be found in table 5 and 6.

6.2.2 Public firms

In the public firm's regression, one can observe the F statistic and see that all models are statistically significant at least at the 5% level. The models overall R-squared varies from 19% to 22%

Table 6. Results for matched sample

Dependent variable	Private firms						Public						Difference?					
	ROA (NI)			ROE (NI)			ROA (NI)			ROE (NI)			ROA			ROE		
Independent variable	TD	LTD	STD	TD	LTD	STD	TD	LTD	STD	TD	LTD	STD	TD	LTD	STD	TD	LTD	STD
	0.078*	-0.003	0.101*	0.323**	0.225	0.413**	-0.145	0.214**	-0.105	0.229*	0.434***	0.082	-	-	+	-	-	-
	(2.18)	(-0.03)	(1.72)	(2.33)	(0.68)	(2.29)	(-0.58)	(2.56)	(-1.56)	(1.65)	(2.59)	(0.64)						
Control variables																		
Size	-0.065	-0.098	-0.059	-0.321**	-0.375	-0.295**	-0.094*	-0.131***	-0.075	-0.178**	-0.182**	-0.134	-	-	-	+	-	+
	(-1.19)	(-1.22)	(-1.29)	(-2.16)	(-1.60)	(-2.01)	(-1.65)	(-2.65)	(-1.47)	(-2.00)	(-1.84)	(-1.38)						
Growth in sales	0.075*	0.177***	0.081**	0.236**	0.585***	0.259**	-0.099*	-0.082*	-0.112**	-0.112	-0.068	-0.116	+	+	+	+	+	+
	(1.85)	(2.61)	(1.98)	(2.15)	(2.95)	(2.35)	(-1.73)	(-1.65)	(-2.22)	(-1.24)	(-0.68)	(0.86)						
Growth in assets	0.026	0.125**	0.023	0.138	0.203	0.125	0.353***	0.364***	0.311***	0.401***	0.440***	0.361***	+	+	+	-	-	-
	(0.65)	(2.27)	(0.57)	(1.26)	(1.27)	(1.14)	(5.00)	(5.89)	(4.91)	(3.65)	(3.56)	(3.00)						
Efficiency	0.002	0.008	0.000	0.015	-0.038	0.009	0.047	0.042	0.047	0.043	0.172**	0.161**	-	-	-	-	+	-
	(0.14)	(0.40)	(0.20)	(0.36)	(-0.65)	(0.826)	(0.96)	(0.98)	(1.14)	(0.56)	(1.98)	(2.05)						
Risk	0.044	-0.314	0.044	0.033	-0.368	0.030	-0.367**	-0.247**	-0.171	0.001	0.185	0.196	-	-	-	-	-	-
	(0.18)	(-0.83)	(0.18)	(0.05)	(-0.33)	(0.17)	(-2.41)	(-1.92)	(-1.28)	(0.00)	(0.72)	(0.76)						
constant	0.359	0.590	0.325	1.672**	2.292*	1.539**	0.548**	0.549**	0.378	0.910**	0.699	0.690						
	(1.29)	(1.33)	(1.17)	(2.23)	(1.78)	(2.07)	(2.07)	(2.62)	(1.53)	(2.20)	(1.44)	(1.45)						
Within R^2	0.109	0.223	0.064	0.094	0.196	0.105	0.325	0.271	0.212	0.136	0.146	0.095						
F statistic	2.28**	3.41**	2.02*	2.50**	2.89**	2.86**	8.13***	8.39***	6.59***	2.66***	3.86***	1.72*						
N	191	106	191	191	106	191	139	176	188	139	176	188						

p-values are given in parenthesis. ***, **, * represent significance at 1%, 5% and 10% levels, respectively. The difference columns in matched sample show the results of the Chow test. + represents difference of at least 10% level of significance. – represents no difference.

explained the variance. In the model where ROA is Dependent Variable average overall R-squared of 21% percent can be observed. This means that one fifth of the variation in ROA can be explained using these models. Long-term debt and total debt show statistically significant positive influence on the performance, which means that whenever a company has higher debt, the better it performs. This finding confirms the hypothesis. However, Short-Term debt show statically significant negative influence on the ROA. The STD can be explained by the fact that short-term debt motivates myopic behavior in public firms. Since public firms have low information asymmetry, they run the risk of not being able to refinance oneself or the risk of being liquidated by the lender in case they do not meet short-term financial goals. This fear of liquidation may lead to the firms not choosing projects that have greater NPV value but are accrued greater in the future. As well as investment in new technology may be rejected, unless an immediate payoff is provided, which

results in poorer performance. As for control variables, Growth in Assets has a positive impact on the dependent variable in all of the models. Risk and efficiency have a significant strong negative influence on the ROA in all of the models. Overall, the results of the regressions on public firms mainly confirm the hypothesis that debt influences public firms positively. However, due to low information asymmetry of the public firms and general myopia of public firms, STD influences the ROA negatively.

6.2.2 Private firms

As for the private firms, all models are statistically significant at least at 1% level and have an overall R-squared ranging from 11% to 19%. In the ROA models, Total Debt and Short-Term Debt confirm the hypothesis by illustrating significant positive results. Long Term Debt, however, contradicts the hypothesis and shows a significant negative result. This can be explained by high floatation costs that private companies have to incur in order to get access to debt with high maturity. Another explanation is the underinvestment problem postulated by Myers (Myers, 1977). Because longer term investment increases the share of return that the debt holders will get from the investment, owners prefer to underinvest. This has an influence on the total return on the company, however, does not influence the return of the investors, as can be seen with the case of ROE. ROE is significantly and positively influenced by TD and STD, which confirms the hypothesis. As for control variables, size, growth in sales, growth in assets, efficiency and risk all have positive significant impact on both dependent variables in most models.

6.2.3 Comparison

Results of the regressions on the matched samples can be seen in the table 6. First ROA will be compared and then the ROE models. The regression found that short term debt has a positive significant impact on private firms, but no significant impact on private firms. Chow-test shows that there is difference in the influence of short term debt on ROA between private and public firm. All other variables are not different between private and public firms. Chow test showed that none of ROE models have a statistically significant difference in the dependent variables. Therefore, the third hypothesis can be confirmed by concluding that there is no difference between influence of capital structure on performance between private and public firms.

6.3 Robustness testing

As for robustness testing few approaches were taken. Firstly, the dependent variable was measured, using other proxies, namely, instead of using Net income, EBIT was used. When regressions were run again, no difference from the findings of the main model were found. As for the second robustness test, pooled OLS with the observations being the time-series means of the different firms, was performed (Heyman, 2008). Effects on performance in these models were controlled by industry dummy (two-digits SIC code). These models did not show any strong convergence from the main model either.

7.CONCLUSION

This paper investigated the relationship between capital structure and firm performance employing fixed effect regression model for the analysis of private and public firms. The results confirmed the hypotheses and stated that capital structure influences the financial performance of private firms positively, except for the case of the influence of long-term debt on return on assets, which was explained by increased impact of underinvestment problem and great floatation costs. In the case of public firms, the prediction of the hypothesis held true, excluding the case of short-term debt, which is found to influence ROA negatively. Short-term debt's deviation from the prediction is explained by the fact that it induces myopic behavior. When comparing the regressions of the two samples, only short-term debts influence on ROA was found to be statistically significantly different between the two types of companies. It is assumed that it is due to higher cost of accessing the long-term debt market by private firms. As for the future research it would be interesting to investigate it by including cost of debt and different floatation costs into the model. All in all, influence of debt on the firm's performance was found not to be significantly different between private and public firms.

This research contributed to the body of research on influence of the capital structure on firm financial performance and illustrates the relationships between debt and performance of private firms, which was never done before. It also adds to the research on public firms. It compares the results and finds that influence of the capital structure on performance is not different for private and public firms. This should add to the power of generalization for research on samples of public firms only. As for practical implications of the research, managers of private firms can bravely rely on debt in their capital structure and increase the short term debt portion of it in order to increase performance.

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9. APPENDICES

Table 2. Names, abbreviations and measurements of variables

Name and Abbreviation	Measurement
Return on Assets NI (ROANI)	Net income / total assets
Return on Equity NI (ROENI)	Net income / equity
Return on Assets EBIT (ROAEB)	EBIT / total assets
Return on Equity EBIT (ROEEB)	EBIT / equity
Total Debt (TD)	Total debt / Total assets
Long term debt (LTD)	Long-term debt/Total assets
Short term debt (STD)	Short-term debt/Total assets
Size(SIZE)	Lg(Sales)
Growth in sales(GS)	Annual percentage change in sales
Growth in assets(GA)	Annual percentage change in assets
Efficiency(EFF)	Sales/Total assets
Risk(RSK)	Standard deviation of ROA

Table 4. Correlation matrix

Privately held

Variables	ROA NI	ROE NI	ROA EB	ROE EB	TD	LTD	STD	SIZE	GS	GA	EFF	RSK
ROA NI	**1.00**	0.66	0.91	0.59	0.18	-0.19	0.04	0.09	0.14	0.09	0.17	0.16
ROE NI	0.20	**1.00**	0.65	0.89	0.19	0.00	0.23	0.12	0.14	0.09	0.21	0.14
ROA EB	0.87	0.26	**1.00**	0.68	-0.11	-0.16	-0.00	0.12	0.15	0.09	0.20	0.12
ROE EB	0.15	0.87	0.24	**1.00**	0.25	0.03	0.25	0.14	0.14	0.08	0.22	0.10
TD	0.02	0.02	0.09	0.09	**1.00**	0.55	0.67	0.10	0.04	-0.03	0.23	-0.09
LTD	0.05	0.04	0.03	0.01	0.60	**1.00**	-0.44	-0.20	-0.05	-0.05	-0.33	-0.01
STD	0.04	0.01	0.11	0.09	0.57	-0.11	**1.00**	0.14	0.06	0.01	0.45	0.02
SIZE	0.30	0.04	0.32	0.06	0.30	0.11	0.28	**1.00**	0.11	0.05	0.38	-0.12
GS	0.04	-0.01	0.05	-0.02	-0.11	-0.09	0.01	-0.00	**1.00**	0.31	0.12	-0.06
GA	0.14	-0.00	0.05	-0.03	-0.05	-0.03	0.01	-0.01	0.48	**1.00**	-0.04	-0.01
EFF	0.11	0.18	0.17	0.17	0.20	0.46	-0.34	0.16	-0.05	-0.13	**1.00**	-0.03
RSK	0.48	-0.13	-0.50	-0.15	-0.28	-0.02	-0.25	-0.42	0.06	0.01	-0.01	**1.00**

Publicly held

The left side of the matrix represents the values of public firms dataset, whereas the right side represents the values for private firms dataset.

Table 6. F-values of difference in regressions between public and private Dutch companies

DV	ROANI			ROENI		
IV	TD	LTD	STD	TD	LTD	STD
	2.27	1.22	5.17**	0.21	0.32	2.49
SIZE	1.37	0.14	0.89	3.38*	2.00	3.42**
GS	7.29***	6.64***	8.25***	6.21***	8.88***	7.72***
GA	11.02***	3.17*	9.78***	2.25	0.97	1.17
EFF	0.36	0.17	1.18	0.14	2.92*	1.40
RSK	0.82	0.11	0.17	0.03	0.80	0.16

F-values are deducted using Chow test. ***, **, * represent significance at 1%, 5% and 10% levels, respectively.

IV	TD	LTD	STD	TD	LTD	STD
	2.27	1.22	5.17**	0.21	0.32	2.49
SIZE	1.37	0.14	0.89	3.38*	2.00	3.42**
GS	7.29***	6.64***	8.25***	6.21***	8.88***	7.72***
GA	11.02***	3.17*	9.78***	2.25	0.97	1.17
EFF	0.36	0.17	1.18	0.14	2.92*	1.40
RSK	0.82	0.11	0.17	0.03	0.80	0.16