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Board gender diversity and its effect on Capital Structure – A comparison between the Financial and Non-Financial sector

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While the majority of the financial literature indicates a negative relationship between gender board diversity and capital structure, some disagreements still persist. Furthermore, some studies suggest that this effect might be mitigated when we look at female directors in a financial setting. This paper thus investigates this suspicion by adopting a new panel data set which includes firms from both the financial and non-financial sector, covering a timeframe of 2000 until 2018. While the results reveal a negative tendency between gender diversity and capital structure, the unique timeframe of this study allows for the inclusion of a financial crisis effect, which greatly reduces the statistical significance of the negative correlation found. Additionally, this paper finds that the effect of gender diversity on capital structure is actually larger and more significant for financial firms relative to non-financial firms. While this study provides some evidence for the negative effect of board gender diversity on capital structure, further research on the topic is required.

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Table of Contents

1. Introduction

Several studies investigated the relationship between gender board diversity and capital structure, while the majority of the financial literature indicates a negative relationship between gender board diversity and capital structure, some disagreements still persist. More importantly, some studies suggest that this effect might be mitigated when we compare female directors in a financial setting versus a non-financial setting. This paper examined these suspicions by adopting a new dataset consisting of both financial and non-financial firms. It also provides some small evidence towards the pecking order theory.

The capital structure theorem of Modigliani and Miller (1958) has led to many studies which look at the financing strategies of firms and financial institutions. The two main streams are the *Trade-off* and *Pecking order theory,* where the former believes that companies aim for a certain optimum allocation of debt and equity, the latter argues that companies have an order of preference for certain forms of finance instead. The financial literature indicates that board composition has an influence on the financing strategies of a firm (Alves, Couto, & Francisco, 2015). A more gender diversified firm (higher percentage of women) is then believed to be more risk-averse, which has an effect on their capital structure. However, some evidence indicates that women do not show more risk-averse behavior on the condition that they are active in the finance profession (Adams & Ragunathan, 2015; Hibbert, Lawrence, & Prakash, 2013). Studies on capital structure generally exclude either financial or non-financial firms from their sample, which makes it especially interesting to research the effect of gender board diversity while comparing between the financial and non-financial sector. This leads to the following research question:

"*What is the effect of gender board diversity on the capital structure of firms?"*

Additionally, research was conducted to look at the differences in this effect between the financial and non-financial sector. In order to answer this research question, this paper collected annual data from 4704 unique firms located over 31 countries with a timeframe of 19 years between the year 2000 through 2018. A panel data analysis was conducted using both Fixed and Random effects models.

The findings of this thesis reveal a (negative) tendency between a firm's gender board diversity and its capital structure. However, these results seem to be significantly mitigated when a financial crisis control dummy is included in the model. Definite conclusions regarding gender board diversity on capital structure can thus not be made until further research has been conducted. Furthermore, while this thesis predicted that the effect of gender diversity on capital structure would be significantly weaker/lower in financial firms relative to non-financial firms, the findings actually show the complete opposite relation. The results indicate that the effect of gender diversity on capital structure is actually bigger and more significant in financial firms relative to non-financial firms.

This paper has several contributions to the existing literature. Firstly, as the effect of board gender diversity on capital structure is still ambiguous, this research sheds light on the issue by taking a new dataset and timeframe. Secondly, while it is generally assumed that women are more risk-averse than their male counterpart, several studies indicate that this effect is mitigated when one looks at women with financial expertise. This study thus challenges these suspicions by investigating this moderating effect by looking at both the financial and non-financial sector.

The remainder of this proposal is as follows. Chapter 2 will present the literature review and findings of the current relevant literature. This is followed by Chapter 3, which shows the data, method, and econometric models used. Chapter 4 will present the results, and contrast these with the current financial literature regarding this topic. Chapter 5 is the conclusion and discussion section, where the findings are summarized together with the thesis's implications and limitations. The references and the appendix can be found in chapter 6 and 7 respectively.

2. Literature Review

2.1 Capital structure

The current capital structure theories started with the model of Modigliani and Miller (1958). They derived that in the absence of taxes, information asymmetry, agency problems, and bankruptcy costs, the market value of a company is unaffected by the way it is financed. A few years later Modigliani and Miller (1963) made a correction to their model which incorporated taxes and allowed for the tax deductibility of debt, also known as a tax shield. As the corporate tax rate is independent of the leveraged position, the tax shield value increases as a company takes on

more debt (Wrightsman, 1978). Under the assumption of riskless debt, a company will then maximize its value by maximizing debt (Modigliani & Miller, 1963; Myers, 1984; Wrightsman, 1978). In reality, debt is not riskless, and companies will not take on a fully leveraged position due to the expected costs of financial distress which increases as the relative use of debt financing increases (Adusei & Obeng, 2019). These costs include the direct administrative and legal costs of bankruptcy, as well as the indirect costs of monitoring, moral hazard, contracting costs, and the loss of goodwill and sales resulting from operating the company at high levels of financial distress (Myers, 1984). At higher levels of relative debt, the shareholders experience less risk on their funds and will push for higher risk/return strategies. This leads to the asset substitution problem, where the interests of shareholders are pursued by shifting the risk towards the debtholders at higher levels of leverage (Adusei & Obeng, 2019). Debt holders respond in kind by asking for a higher premium on debt, or by imposing stronger debt covenants to restrict manager's actions, increasing financial distress costs when relative debt increases (Jensen & Meckling, 1976). This brings us to the *Trade-off Theory*, where the capital structure of a company is decided by a trade-off between the benefits of the tax shield and the financial distress costs of issuing debt in order to maximize the value of the company (Bhagat, Bolton, & Subramanian, 2011; Wrightsman, 1978).

The *Pecking order Theory* rejects the concept of a company pursuing an optimal capital structure where firm value is maximized by minimizing the cost of capital, but states instead that a company will show a defined order of preference when using financing sources (Donaldson, 1961). Myers and Majluf (1984) and Myers (1984) expand on this theory by referring to information asymmetry between outside investors and managers, resulting in adverse selection problems (Alves et al., 2015). Myers (1984) deducts that when managers have more information than outsiders, they will make use of this in their financial decisions. More specifically: When management has unfavorable inside information, then risky security issues would be overpriced, and using stock would be better than using debt (and vice versa) (Myers, 1984). This results in issuing debt when the company is undervalued, and issuing equity when it is overvalued (Myers, 1984). Investors are aware of this, and the issuing of equity capital will result in a higher premium in cases of information asymmetry (Myers, 1984). Companies are thus forced in a pecking order. In this framework, internal financing in the form of retained earnings is preferred over external financing (Alves et al., 2015). If external financing is required a company will choose to issue debt securities first, followed by equity securities (Myers, 1984; Myers & Majluf, 1984). More specifically,

according to Alves et al. (2015) information asymmetries between the investor and management will lead to firms preferring to use capital in the following order: Retained earnings, Short term debt, Long term debt, and lastly equity.

2.2 Gender board diversity

The financial literature on board gender diversity stems from the belief that women and men have different qualities regarding overconfidence, mutual trust, and risk aversion, and that these have an impact on the financial decision making process and performance of management (Beck, Behr, & Guettler, 2013). Several studies cover this topic, and experimental studies confirm that gender differences exist in financial decision making: Powell and Ansic (1997) suggest that women are less risk seeking than men in financial decision making processes, irrespective of context factors such as ambiguity, familiarity, and framing. A more recent study by Charness and Gneezy (2012) also finds robust results indicating that women are less-risk seeking than men using a database of 146 economic students.

The relation between risk aversion and capital structure is however not clear-cut in the financial literature. Adusei and Obeng (2019) follow the pecking-order theory and deduce that firms should prefer less risky securities such as short term debt over risky securities such as long term debt and new equity. A more gender diversified board should then finance their operations with relatively more debt than equity, a positive relationship. There are however numerous papers which suggest otherwise. Bardsley (1995) indicates that greater risk aversion leads to a reduction in the amounts borrowed, while Berk et al. (2010) suggest that firms with more risk-averse employees should hold less debt. Additionally, Bhagat et al. (2011) show that short term debt and total debt decreases with increasing managerial risk aversion, while long term debt increases.

Aside from risk aversion, financial literature also suggests that information asymmetry might play a role between gender board diversity and capital structure. Alves, Couto, and Francisco (2015) argue that a more effective and independent board will result in a higher quantity and quality of data provided to outside investors, and thereby reduce the information asymmetry between management and the public. If the order of preferred financed source indicated by the pecking order theory can be attributed to information asymmetry, we can argue that firms will take on relatively more equity then debt when information asymmetry decreases (Adusei & Obeng, 2019). It is then expected that a more gender diversified board is more efficient, and which lowers information

asymmetry accordingly (Alves et al., 2015). Both Adusei & Obeng (2019) and Alves et al. (2015) show evidence for a negative relationship between information asymmetry and capital structure.

2.3 Comparing Financial and Non-Financial Firms

The majority of the finance literature focuses solely on either financial firms or non-financial firms, while excluding the other one. Alves and Ferreira (2011) and Alves et al. (2015) for example chose to exclude financial institutions, as they are subject to different regulations relative to non-financial firms which have an influence on their leverage. Likewise, Rajan and Zingales (1995) exclude banks and insurance companies, as their debt and equity structures differ significantly from those of non-financial firms. There are however also studies which choose to explicitly research financial institutions, such as Adusei et al. (2019) which focus on the board gender diversity effect on microfinance institutions.

There are however some interesting findings in the gender diversity literature, which may hint at a possible distinction of risk behavior between women in the financial sector and the non-financial sector worth researching. While the financial literature assumes that women are generally more risk averse than men, some studies hint at a potential outlier. Hibbert, Lawrence, and Prakash (2013) find that even when comparing between highly educated individuals, women are still significantly more risk averse than their male counterpart, indicating that education itself does not mitigate the gender effect in risk aversion. However, when they compare women and men which have achieved a high level of financial education, they are equally as likely to invest in risky assets, indicating that financial education might be a mitigating factor. Adams and Ragunathan (2017) also show that conditional on being in the financial industry, women do not show a more risk averse attitude compared to their male counterpart. This indicates that women may not show different behavior in risk when compared to men, on the condition that women are active in finance.

In general terms, the condition that women are active in finance can act as a moderator variable, which affects the direction and/or strength of the effect between board gender diversity and capital structure (Baron & Kenny, 1986). This has possible implications for the existing financial literature of women and risk-taking behavior, such as the findings of Faccio, Marchica, and Mura (2016), which find that firms run by female CEOs have less volatile earnings, lower leverage levels, and a higher chance to survive. This thesis aims to shed light on this issue by researching this moderating

effect, by comparing samples solely consisting of firms in the financial sector versus a sample consisting of non-financial firms.

2.4 Hypotheses development

To shortly reiterate, since the capital structure theorem of Modigliani and Miller (1958) many studies have been conducted on the determinants which impact the financial strategies of firms. While the majority of the financial literature indicates a negative relationship between gender board diversity and capital structure, some disagreements still persist. This study will thus confirm the relationship by using a new dataset and timeframe. The research question of this thesis is thus as follows: *What is the effect of gender board diversity on the capital structure of firms?*

Following from the literature review, women are assumed to be more risk averse than men. Then, according to the pecking-order theory interpretation of Alves et al. (2015), a higher gender diversified board should result in the use of relatively more equity in favor of debt. Resulting in the following hypothesis:

H1. *Board gender diversity has a significantly negative effect on the capital structure (Debt/Equity) of firms.*

Furthermore, while many studies on capital structure exist, to the author's knowledge, none use a sample consisting of both financial and non-financial firms as indicated in the previous section. By using a sample which includes both of these sectors, more insight on the effect of gender board diversity on the financial strategy of a firm is gained. More importantly, is that by including both these sectors it allows for the testing of the suspicion in the financial literature which states that women are not more risk averse than men when observed in a financial environment. This study will thus also test whether the gender board diversity effect differs between firms active in the financial and non-financial sector. As women in financial industries do not seem to differ in risk attitude when compared to men, I hypothesize that the effect in financial industries will show a non-existent/weaker negative effect on capital structure when compared to non-financial industries.

H2. *Board gender diversity has a significantly weaker/nonexistent effect on the capital structure of financial firms when compared to non-financial firms.*

3. Research Design

The aim of this study was to analyze whether there is a relation between the level of board gender diversity and the financial strategy of a firm, while taking several firm- and macro specific control variables into account. Due to data limitations, the research focused mainly on firms located in the European Union (EU). Additionally, this thesis also investigated whether the financial sector mitigates the effect of board gender diversity on capital structure, by comparing between a financial and non-financial sample. In order to test these relationships, a quantitative research method was adopted in the form of a panel data analysis. A similar approach by Talberg, Winge, Frydenberg, and Westgaard (2008) was adopted, where a dummy variable was created to separate the two different sectors. The following sections will shortly describe the sample studied, followed by the variables and econometric models used.

3.1 Data – sample

In order to answer whether gender board diversity has a significant effect on the capital structure of a firm, this paper collected annual data from 4704 unique firms located over 31 countries. The sample covers a timeframe of 19 years between the year 2000 through 2018. The board gender data was computed using the BoardEX database which solely contains information regarding large listed firms in Europe and the UK, limiting the range of the scope of this thesis. The dependent variable(s) as well as the firm-level control variables were computed by data retrieved from both EIKON and Orbis, and are all measured in thousands of euros. Lastly, the macroeconomic variables GDP per capita and the Economic Freedom Index (EFI) were acquired from Eurostat and the Heritage Foundation respectively.

The distribution of the 4704 firms with respect to their countries of origin are shown in *Figure 1.* While the majority of the countries seem to be roughly equally represented in the data under 5%, three outliers are present: Germany (8.1%), France (11.35%), and the United Kingdom (47.3%). Especially the UK has a massive presence in the sample with 2225 unique firms. The huge amount of UK firms in the sample is due to the nature of the BoardEX database, which has two separate sections from where company data can be retrieved: The United Kingdom, and the European database. Additionally, the right-hand side of *Figure 1.* shows the distribution of financial and non-financial firms in the sample, with respectively 1012 and 3692 unique firms.

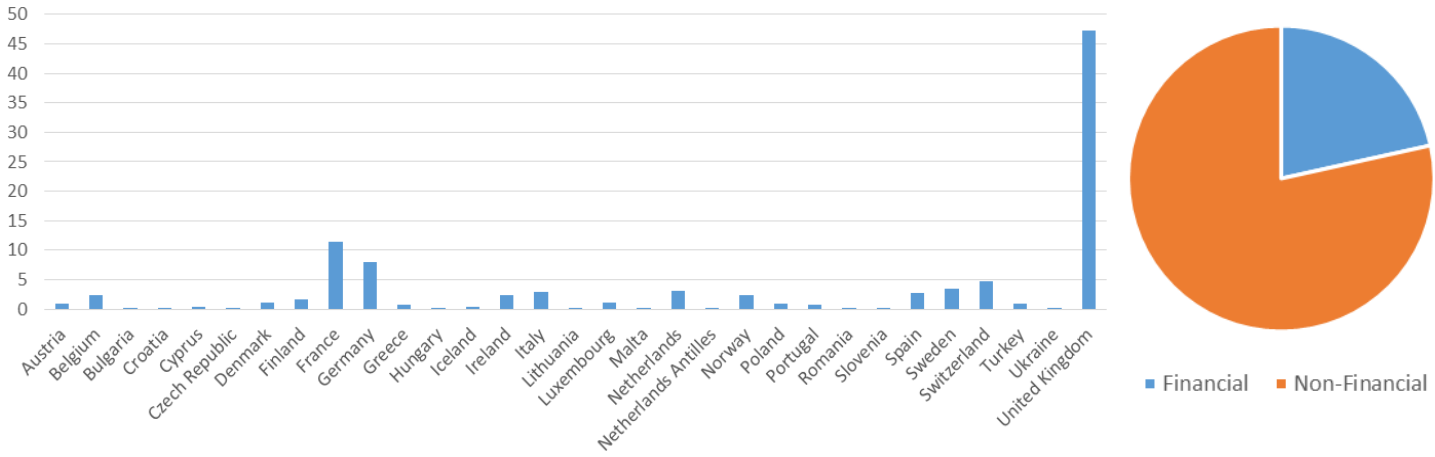

FIGURE 1. THE SAMPLE DISTRIBUTION

Note: In percentage terms, the left-hand side of the figure shows the country distribution of the sample. The right-hand side shows the distribution regarding financial and non-financial companies, respectively 21.5% and 78.5%

3.2 Variables

3.2.1 *Dependent variable (Capital Structure)*

The dependent variable of this study is the capital structure of a firm. Capital structure, however, can be defined in numerous ways and differ among studies based on the objective of that particular research (Rajan & Zingales, 1995). The term capital structure basically refers to a mixture of financing methods such as debt, and equity (Bowman, 2002). In order to properly capture the capital structure of a firm, this thesis adopted several different measures. The broadest definition of capital structure is the ratio of total debt divided by total shareholder equity, and was also adopted in this study (hereafter Capital Structure). Two additional measures were adopted which capture both the Short Term and Long Term financial strategies of a particular firm, hereafter referred to as STCapStructure and LTCapStructure respectively. STCapStructure is then defined as a firm's short term debt divided by total shareholder equity, while LTCapStructure is defined as a firm's long term debt divided by total shareholder equity. By using these three different measures of capital structure, it is also possible to gain insight in to what extent long term and short term financing strategies are influenced.

3.2.2 *Independent variable (Gender Diversity)*

The independent variable of interest in this study is a firm's board gender diversity. This paper follows similar studies on gender diversity, and defines gender diversity as the percentage of

women in the board of directors in a particular year (Bernile, Bhagwat, & Yonker, 2018). By adopting this particular measure of board gender diversity, it allows for better/easier comparability to studies in the existing financial literature. As explained in the literature section of this paper, a more gender diversified board (higher percentage of women) is then expected to significantly negatively influence a firm's capital structure.

3.2.3 *Firm specific control variables*

In order to control for various effects on a firm's capital structure, several firm-level control variables were included after carefully reviewing the current financial literature on capital structure: board size; size; age; profitability; growth; tax rate; and tangibility.

As the positions on the board of directors are generally predominated by males, the chances of a female being in the board are thus higher for firms which have a relatively large amount of people in the board of directors. For this reason, the size of the board - the number of directors in a board of directors - was included as a control variable.

The size of a firm is expected to have a positive influence on the capital structure of a firm, of which the most plausible explanation is through a decrease in bankruptcy costs (Rajan and Zingales, 1995). Alves et al. (2015) provide three reasons for such an explanation: 1) Larger firms are expected to have a more diversified portfolio than their smaller counterparts, reducing the risk of bankruptcy. 2) Financial institutions have less information regarding smaller firms when compared to big firms, and relatively more resources are needed to finance the monitoring costs of such small firms, requiring a higher interest on their loans. 3) Larger firms have lower bankruptcy costs on average, which are generally more fixed. Rajan and Zingales (1995) have confirmed a positive relationship between the size of a firm and its leverage. The Size of a firm was calculated by taking the natural logarithm of the total assets of a firm +1. A natural logarithm was used in order to smoothen out the effect of high positive outliers, while the +1 was added as a constant in order to avoid truncation of the variable at a value of 0.

Life cycle theory suggests that firms go through several stages when they age: startup, growth, and finally maturity. According to life cycle theory, a firm experiences different caveats based on its position in the life cycle (Adusei & Obeng, 2019). For example, a firm in the startup stage may have difficulty acquiring borrowed funds due to a lack of collateral and is therefore forced to rely on equity. Younger firms are thus expected to have lower capital structure ratios, as they do not have the debt capacity that their older counterparts have and are forced to rely on internal funds

such as retained earnings (Adusei & Obeng, 2019). The age variable was computed by taking the natural log of a firm's age based on its date of incorporation, a constant of +1 is added before taking the natural log in order to avoid truncation of the variable at a value of 0. Age is expected to positively influence the capital structure of a firm.

The early theory of capital structure composed by Modigliani and Miller (1963) predicts a positive relationship between a firm's profitability and capital structure, where a company may take on more debt in order to maximize the value of their tax shield. However, the pecking order theory by Myers and Majluf (1984) predicts the opposite: When possible a firm will first use internal funds, followed by external funds, and issue stock only as a last resort. This is because issuing stock gives off a negative signal to outside investors, while debt financing with the use of collateral assets is interpreted positively by the market (Alves et al., 2015). Following this line of reasoning, the profitability of a firm builds up internal funds in the form of profit/retained earnings and will decrease the use for external debt, suggesting a negative relationship between profitability and capital structure. While empirical results generally support this theory (Alves & Ferreira, 2011; Rajan & Zingales, 1995), some studies report contradicting results. (Adusei & Obeng, 2019). Profitability was then defined as a firm's earnings before interest, taxes, depreciation and amortization (EBITDA), divided by total assets.

Referring back to the literature section, the asset substitution problem occurs when the interests of shareholders are pursued at the cost of bondholders. This happens more frequently when firms are at higher levels of leverage and are provided with relatively high growth opportunities (Alves et al., 2015). This is because firms with relatively high leverage ratios are inclined to accept high risk high reward opportunities, while higher growth opportunities allows firms to shift their risk to bondholders (Alves et al., 2015). Following Alves et al. (2015), this thesis included Growth, defined as the percentage of sales growth from year t to t+1, as a proxy for growth opportunities. Growth opportunities are expected to positively influence capital structure.

As discussed in the literature review tax shields play a very significant role in the financing strategies of a firm, and are an important determinant of a firm's capital structure. Therefore the effective tax rate, calculated by income tax divided by profit before taxes (Alves et al., 2015), was included as a control variable.

In order to acquire new loans creditors generally demand more tangible assets, indicating a positive relationship between a firm's tangibility and capital structure (Alves & Ferreira, 2011).

This reasoning is supported by Rajan & Zingales (1995) which state that tangibility is expected to positively affect debt levels, for the reason that tangible assets are easily used for collateral and decreases the costs of debt. However, according to Alves and Ferreira (2011) other authors find a positive relationship between leverage and long-term debt, but a negative relationship between leverage and short-term debt. Tangibility is defined as a firm's property, plant, and equipment (net) divided by its total assets.

3.2.4 *Country-specific Control variables*

In addition to the firm-specific control variables, two macroeconomic control variables were added to account for country heterogeneity in the data: Economic development, and Creditor rights.

The economic development of a country is believed to influence the financing behavior of firms. Firms located in countries with a strong economy are expected to produce a relatively higher amount of retained earnings relative to firms located in weaker economies, which decreases their need of external sources of finance (Adusei & Obeng, 2019). The economic development of a country is expected to negatively influence the capital structure of a firm, which is defined as the natural logarithm of GDP per capita.

Countries with a higher creditor rights score should protect the rights of lenders and borrowers, and should facilitate the lending behavior of firms (Alves et al., 2015). Beck, DemirgüÇ-Kunt, and Maksimovic (2005) elaborate on this and find that firms in countries with weak financial institutions make less use of external finance. In order to take this effect into account, the Economic Freedom Index (EFI) computed by the Heritage Foundation (2019) was included as a control variable. The heritage foundation measures EFI based on twelve quantitative factors, which are divided into four pillars of economic freedom: Rule of law, Government Size, Regulatory Efficiency, and Open markets. The countries are scored based on these criteria on a scale of 0 to 100, with each category being weighted equally. According to the Heritage Foundation (2019), a higher score represents a society where a human is able to control his own property, investments, and labor more freely. Additionally, governments better promote the movements of capital and goods, while refraining from the constraint of liberty. A higher EFI score is then expected to positively influence the capital structure of a firm.

Table A3 in the appendix gives a short overview of all the variables and their notations, along with the datasources used for each specific variable.

3.3 Descriptive statistics

The summary statistics are presented in *Table 1*. Panel A consists of the whole sample, while Panel B and Panel C give a representation of the financial and non-financial sample respectively. A firm is considered to be operating in the financial sector when their SIC code starts with a 6, and is considered non-financial otherwise. Of interest are the three dependent variables of capital structure, and the main independent variable Gender Diversity. The Capital Structure variable shows a mean value of 77.78% over the whole sample. This is considered a relatively normal level according to Adusei & Obeng (2019), which state that the rule of thumb for a debt-to-equity ratio is that a level above 100% indicates a high level of gearing. The maximum and minimum value however, suggests that relatively big outliers are present in the sample, which explains the high standard deviation 71.0925. Roughly the same deductions can be made when looking at the Short (ST) and Long Term (LT) capital structure variables in Panel A, showing a relatively normal mean with a high standard deviation. Due to these high outliers, the capital structure variables were winsorized at the 2nd and 98th percentile, and are presented in *Table 1* in bolded text below the original capital structure values. The winsorized capital structure variables have a significantly lower minimum, maximum, and standard deviation. Due to these outliers, the regressions used in the following sections will be using the winsorized independent variables, as the original variables might significantly alter the results of the analysis. Another thing to note, is that the firms in this sample make relatively more use of long term debt than short term debt, respectively coming to an average of 0.5012 and 0.2728. The gender diversity variable shows that women make up about 11% of the boards in the sample, but that a relatively large part of the boards occupies 0 women, as indicated by a p25 of 0 and a median of 0.1108.

Turning to Panel B and C, it can be immediately noted that the mean value of the capital structure variable is significantly higher in the non-financial sample C relative to financial sample B. This indicates that non-financial firms operate at a higher level of gearing than financial firms. These panels are also highly influenced by the presence of big outliers, resulting in a high standard deviation. The winsorized variables tell a very different story, which show a relatively high level of gearing for financial companies (1.3402) and a relatively low level for non-financial companies (0.6344). The ratio of long term debt relative to short term debt however, is roughly the same and equal to that of the whole sample (roughly 60%). Gender diversity also indicates that roughly the same relative amount of women operate in both sectors.

TABLE 1. SUMMARY STATISTICS

	N	Mean	Median	Minimum	Maximum	Std. Dev
Panel A.	*Pooled sample (4707 firms)*					
Capital Structure	62072	0.7778	0.3151	-15460.7000	4752.5000	71.0925
Capital Structure (win)[a]	**62072**	**0.7849**	**0.3151**	**-1.6739**	**7.7090**	**1.5119**
ST Capital Structure	59901	0.2810	0.0638	-7061.6000	1937.9808	30.8900
ST Capital Structure (win)[a]	**59901**	**0.2728**	**0.0638**	**-0.3444**	**3.3746**	**0.6161**
LT Capital Structure	61829	0.5080	0.1536	-8399.1000	4685.0000	45.8831
LT Capital Structure (win)[a]	**61829**	**0.5012**	**0.1536**	**-0.8835**	**4.8044**	**0.9525**
Gender Diversity	44725	0.1108	0.0588	0	1	0.1367
Board Size	44726	8.26	7	1	60	4.31
Size	62661	12.33	12.32	0	21.33	2.54
Age	76881	2.98	2.94	0	7.61	1.21
Profitability	58725	0.0234	0.0827	-326.2667	2441.5313	11.0714
Growth	59974	2.5994	0.0553	-380.8750	61691.0000	260.6061
Tax Rate	60182	0.1284	0.1602	-363.3684	613.4737	4.0987
Tangibility	59243	0.2268	0.1277	0	2.5541	0.2531
EFI	89319	73.01	74.9	45.8	82.6	6.39
GDP P/Capita	89190	10.35	10.33	8.01	11.34	0.31
Panel B.	*Financial firms (1012 firms)*					
Capital Structure	13670	0.4984	0.2791	-15460.7000	1979.7596	134.0299
Capital Structure (win)[a]	**13670**	**1.3402**	**0.2791**	**0**	**12.8329**	**2.5460**
ST Capital Structure	12406	0.2145	0.0583	-7061.6000	1029.9833	64.4857
ST Capital Structure (win)[a]	**12406**	**0.6089**	**0.0583**	**0**	**7.0576**	**1.4034**
LT Capital Structure	13599	0.3053	0.1445	-8399.1	949.7763	72.9238
LT Capital Structure (win)[a]	**13599**	**0.7360**	**0.1445**	**0**	**7.1304**	**1.3958**
Gender Diversity	9475	0.1175	0.0714	0	1	0.1422
Board Size	9476	8.49	7	1	50	5.0885
Size	13855	13.11	12.93	0.69	21.33	2.84
Age	16747	3.12	3.00	0	7.61	1.34
Profitability	11375	0.1972	0.0333	-112.75	2441.5313	22.9319
Growth	13240	6.3845	0.0431	-380.8750	61691.0000	539.9468
Tax Rate	12746	0.0762	0.0705	-223.1111	112.0556	2.6176
Tangibility	10998	0.2146	0.0158	0	0.9991	0.3484
EFI	19209	73.57	75.8	45.8	82.6	6.23
GDP P/Capita	19184	10.33	10.32	8.37	11.34	0.33
Panel C.	Non- *Financial firms (3692 firms)*					
Capital Structure	48402	0.8567	0.3230	-2167.9451	4752.5000	37.5276
Capital Structure (win)[a]	**48402**	**0.6344**	**0.3230**	**-2.1215**	**5.7628**	**1.1852**
ST Capital Structure	47495	0.2984	0.0652	-391.5500	1937.9808	10.8305
ST Capital Structure (win)[a]	**47495**	**0.1973**	**0.0652**	**0.4780**	**1.9397**	**0.3861**
LT Capital Structure	48230	0.5651	0.1555	-2167.9451	4685.0000	34.6338
LT Capital Structure (win)[a]	**48230**	**0.4358**	**0.1555**	**-1.1647**	**4.1030**	**0.8295**
Gender Diversity	35250	0.1090	0.05	0	1	0.1351
Board Size	35250	8.20	7	1	60	4.0757
Size	48806	12.10	12.13	0	19.46	2.40
Age	60134	2.94	2.94	0	7.61	1.17
Profitability	47350	-0.0183	0.0949	-326.2667	782.2354	5.0687
Growth	46734	1.5271	0.0578	-20.0163	7989.4444	67.5309
Tax Rate	47436	0.1424	0.1802	-363.3684	613.4737	4.4127
Tangibility	48245	0.2295	0.1561	0	2.5541	0.2257
EFI	70110	72.86	74.80	45.80	82.60	6.42
GDP P/Capita	70006	10.36	10.33	8.01	11.34	0.30

Note: The table presents the descriptive statistics for the sample. Panel A consist of the whole sample, while Panel B and C represent the financial and non-financial firms in the sample. The timeframe of this sample is from 2000 up until 2018, covering a range of 19 years.

[a] The capital structure variables are winsorized at the 2nd and 98th percentile.

Table 2 presents the pairwise correlation coefficients over the whole pooled sample (panel A). At first glance, all three capital structure variables seem to positively correlate with the independent variable, implying a positive relationship between board gender diversity and capital structure. However, gender board diversity is also significantly correlated with many other variables in the dataset: it seems that an older, and bigger firm positively correlates with more women on the board. Countries with a higher level of GDP per capita also seems to positively correlate with more women in the boardroom. Quite peculiar is that countries with a higher Economic Freedom Index, which promotes freer movement of capital, labor, and several other factors, has a significantly negative effect on gender board diversity. Due to the correlations between all the variables in the model, a more thorough analysis of the data is needed before drawing conclusions.

TABLE 2. PEARSON CORRELATION MATRIX

	CStructure	STCS[a]	LTCS[a]	GDiversity	Board Size	Size	Age	Prof	Growth	Tax rate	Tangibility	EFI
Capital Structure[a]	1											
STCapital Structure[a]	0.7844**	1										
LTCapital Structure[a]	0.8853**	0.4723**	1									
Gender Diversity	0.0454**	0.0209**	0.0571**	1								
Board Size	0.2464**	0.2002**	0.2447**	0.1169**	1							
Size	0.3386**	0.2405**	0.3494**	0.2436**	0.6139**	1						
Age	0.0812**	0.0780**	0.0715**	0.1790**	0.2574**	0.3723**	1					
Profitability	0.0021	0.0009	0.0028	0.0095	0.0335**	0.0137**	0.0121**	1				
Growth	-0.0021	-0.0028	-0.0014	0.0057	0.0018	0.0011	-0.0047	-0.0005	1			
Tax Rate	-0.0005	-0.0035	0.0011	0.0054	0.0128**	0.0128**	0.0079	0.0003	-0.0003	1		
Tangibility	0.0751**	-0.0524**	0.1559**	-0.0112*	0.0346**	0.1621**	0.0769**	0.0004	-0.0046	0.0025	1	
Ec Freedom Index	-0.1418**	-0.1518**	-0.1216**	-0.2610**	-0.3191**	-0.2387**	-0.1682**	-0.0116**	-0.0005	-0.0053	-0.0198**	1
GDP/Capita	-0.0203**	-0.0639**	0.0080*	0.1115**	-0.1052**	-0.0130**	0.0328**	0.0001	0.0032	-0.0115**	-0.0185**	0.3207**

Note: The table presents pairwise correlations between the variables using the whole panel data set (Panel A).
*,**, represents statistical significance at the 5%, and 1% level respectively.

[a] The capital structure variables are winsorized at the 2nd and 98th percentile.

3.4 Econometric model

As mentioned previously, a similar approach by Talberg, Winge, Frydenberg, and Westgaard (2008) was adopted, where first a regression of the combined sectors was taken without differentiating between financial and non-financial companies. This brings us to the baseline econometric model:

(1) $(ST/LT)Capital\ Structure_{i,t} = \beta_0 + \beta_1 Gender\ Diversity_{i,t} + \beta_2 Board\ Size_{i,t} + \beta_3 Size_{i,t} + \beta_4 Age_{i,t} + \beta_5 Profitability_{i,t} + \beta_6 Growth_{i,t} + \beta_7 Tax\ Rate_{i,t} + \beta_8 Tangibility_{i,t} + \beta_9 EFI_{i,t} + +\beta_{10} GDP/Capita + \varepsilon$

i = firm indicator, t = year indicator

Following these baseline regressions, a financial dummy variable (Fin.Dummy) was added to differentiate between companies operating in the financial and non-financial sector. The financial dummy denominates a 1 for financial companies, and a 0 for non-financial companies. Additionally, an interaction term between the dummy variable and Gender Diversity was added (FinxBGD) in order to test the second hypothesis of this thesis. According to the second hypothesis, the interaction term is expected to show a significant positive coefficient. This results in the following econometric model:

(2) $(ST/LT)Capital\ Structure_{i,t} = \beta_0 + \beta_1 Gender\ Diversity_{i,t} + \beta_2 Fin.Dummy_{i,t} + \beta_3 FinxBGD_{i,t} + \beta_4 Board\ Size_{i,t} + \beta_5 Size_{i,t} + \beta_6 Age_{i,t} + \beta_7 Age_{i,t} + \beta_8 Profitability_{i,t} + \beta_9 Growth_{i,t} + \beta_{10} Tax\ Rate_{i,t} + \beta_{11} Tangibility_{i,t} + \beta_{12} EFI_{i,t} + \beta_{13} GDP/Capita + \varepsilon$

i = firm indicator, t = year indicator

In order to decide whether a Pooled Ordinary Least squares (OLS) regression, Random effects, or Fixed effects model is more appropriate, several tests were conducted. First, a Breusch-Pagan Lagrange Multiplier was performed to test whether a panel effect is detected in the sample. The result of this test can be seen in *Table A1* in the appendix and has a value of 0.000, meaning that the null-hypothesis has to be rejected which states that the variances across the entities are zero. A fixed-effects model should be prioritized over a Pooled OLS regression. Additionally a Hausman test was conducted to check whether the unique errors in the sample correlate with the regressors. Similarly, this test had a value of 0.0000, indicating that the fixed effects model should be prioritized over a random-effects model. *Table A1* also shows the results for the original unwinsorized capital structure variable. Even though the fixed effects model is the preferred model according to the tests, this thesis followed a similar approach to Adusei and Obeng (2019) and

adopted both the fixed and random effects model in an attempt to avoid reporting biased results due to weaknesses in the two different estimation models.

4. Results

4.1 Regression Results

The empirical results of the Fixed and Random effects regression of the baseline econometric model are presented in *Table 3.* The results between the two different estimation techniques are roughly identical, and shows a significant negative coefficient of approximately -0.440 on capital structure, indicating a negative relationship between gender board diversity and a firm's capital structure. This effect seems to hold for both short term debt (ST Capital Structure) as well as long term debt (LT Capital Structure) which also show a significant negative coefficient at a 1% confidence interval. This indicates that an increase in gender diversity affects both short term and long term capital structure negatively. The coefficients for Gender Diversity are larger for LT Capital Structure relative to ST Capital Structure, which is not unexpected as the mean value over the sample is also higher for LT Capital Structure in comparison to ST Capital Structure *(See Table 1)*. These results seem to be in line with the first hypothesis, stating that gender board diversity should negatively influence a firm's capital structure. The R^2, while significantly higher when compared to unwinsorized results, can still be considered relatively low, indicating that the explanatory power of the estimations is low. A possible explanation for this low R^2 could be the inclusion of both financial and non-financial firms in the panel: Similar studies on capital structure generally exclude financial firms/non-financial firms, as they are subject to different regulations, resulting in different capital structure decisions (Alves & Ferreira, 2011; Rajan & Zingales, 1995). The inclusion of a dummy variable might increase the explanatory power of the models.

TABLE 3. BASELINE (1) REGRESSION RESULTS

Panel A:	Fixed Effects Regression			Random Effects Regression		
Variables	CapStructure[a]	STCapStructure[a]	LTCapStructure[a]	CapStructure	STCapStructure	LTCapStructure
Gender Diversity	-0.434***	-0.169***	-0.239***	-0.448***	-0.201***	-0.215***
	(0.060)	(0.024)	(0.039)	(0.054)	(0.022)	(0.035)
Board Size	-0.000	-0.001	0.001	-0.000	0.000	0.000
	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Size	0.185***	0.039***	0.129***	0.201***	0.051***	0.135***
	(0.010)	(0.004)	(0.006)	(0.006)	(0.003)	(0.004)
Age	-0.112***	-0.036***	-0.057***	-0.074***	-0.014***	-0.053***
	(0.018)	(0.007)	(0.012)	(0.011)	(0.005)	(0.007)
Profitability	-0.010***	-0.002	-0.006***	-0.011***	-0.002*	-0.007***
	(0.003)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)
Growth	0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tax Rate	-0.001	-0.000	0.000	-0.001	-0.000	0.000
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Tangibility	0.395***	0.139***	0.258***	0.299***	-0.008	0.342***
	(0.055)	(0.022)	(0.036)	(0.042)	(0.018)	(0.027)
EFI	0.001	-0.002**	0.004**	-0.008***	-0.005***	-0.003**
	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
GDP/Capita	-0.223**	-0.155***	-0.072	-0.159***	-0.134***	-0.024
	(0.087)	(0.035)	(0.056)	(0.046)	(0.020)	(0.029)
Constant	0.956	1.635***	-0.550	0.713	1.440***	-0.633**
	(0.899)	(0.364)	(0.584)	(0.469)	(0.199)	(0.297)
Financial Dummy	NO	NO	NO	NO	NO	NO
Interaction	NO	NO	NO	NO	NO	NO
R^2 - Within	0.0141	0.0067	0.0156	0.0133	0.0046	0.0150
Overall	0.1370	0.0461	0.1605	0.1467	0.0814	0.1666
Observations	38,183	37,506	38,081	38,183	37,506	38,081

Note: The table presents regression results of panel A using the econometric model given in equation (1). The values represent the coefficient of the variable in question, while the value in parentheses beneath those indicate the standard error. ***, **, *, represent statistical significance at the 1%, 5% and 10% level respectively.

[a] The capital structure variables are winsorized at the 2nd and 98th percentile.

Table 4 illustrates the empirical results of the second econometric model, which includes the financial dummy and interaction term. At first glance, the results seemed to be identical to those of the baseline regressions: The control variables do not seem to significantly change, while Gender Diversity remains statistically significant at a 1% confidence interval in all the models, showing a negative coefficient. These findings seem to further support the first hypothesis, and are in line with the findings of Adusei and Obeng (2019), and Alves and Ferreira (2011), which state that women have a substantial and relative effect on the capital structure of a firm resulting in lower levels of gearing. However, the negative effect of long term debt goes against the findings of Bhagat et al. (2011). The financial dummy is also significant, and the positive coefficient indicates that financial firms have a higher level of gearing relative to non-financial firms.

TABLE 4. DUMMY & INTERACTION (2) REGRESSION RESULTS

Panel A:	Fixed Effects Regression			Random Effects Regression		
Variables	CapStructure[a]	STCapStructure[a]	LTCapStructure[a]	CapStructure[a]	STCapStructure[a]	LTCapStructure[a]
Gender Diversity	-0.276***	-0.128***	-0.145***	-0.328***	-0.172***	-0.138***
	(0.065)	(0.026)	(0.042)	(0.058)	(0.024)	(0.038)
Fin. Dummy	-	-	-	0.494***	0.256***	0.189***
				(0.044)	(0.019)	(0.028)
FinxBGD	-0.994***	-0.274***	-0.590***	-0.645***	-0.134**	-0.445***
	(0.154)	(0.064)	(0.100)	(0.140)	(0.059)	(0.090)
Board Size	-0.001	-0.001	0.000	-0.000	0.000	0.000
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Size	0.186***	0.039***	0.129***	0.191***	0.046***	0.132***
	(0.010)	(0.004)	(0.006)	(0.006)	(0.003)	(0.004)
Age	-0.113***	-0.036***	-0.057***	-0.074***	-0.014***	-0.053***
	(0.018)	(0.007)	(0.012)	(0.011)	(0.005)	(0.007)
Profitability	-0.010***	-0.002	-0.006***	-0.011***	-0.002	-0.007***
	(0.003)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)
Growth	0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tax Rate	-0.000	-0.000	0.000	-0.001	-0.000	0.000
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Tangibility	0.406***	0.142***	0.264***	0.317***	-0.004	0.350***
	(0.055)	(0.022)	(0.036)	(0.042)	(0.017)	(0.027)
EFI	0.001	-0.002**	0.004**	-0.009***	-0.006***	-0.003**
	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
GDP/Capita	-0.230***	-0.157***	-0.076	-0.139***	-0.122***	-0.018
	(0.087)	(0.035)	(0.056)	(0.046)	(0.019)	(0.029)
Constant	1.053	1.656***	-0.492	0.589	1.358***	-0.676**
	(0.898)	(0.364)	(0.584)	(0.465)	(0.196)	(0.297)
Financial Dummy	OMITTED	OMITTED	OMITTED	YES	YES	YES
Interaction	YES	YES	YES	YES	YES	YES
R^2 - Within	0.0153	0.0072	0.0166	0.0144	0.0050	0.0159
Overall	0.1257	0.0367	0.1544	0.1599	0.1071	0.1707
Observations	38,183	37,506	38,081	38,183	37,506	38,081

Note: The table presents regression results of panel A using the econometric model given in equation (2). The values represent the coefficient of the variable in question, while the value in parentheses beneath those indicate the standard error. ***, **, *, represent statistical significance at the 1%, 5% and 10% level respectively.

[a] The capital structure variables are winsorized at the 2nd and 98th percentile.

However, what does change is the interpretation of the gender board diversity variable: in the basic econometric model, the coefficient of Gender Diversity represented the in/decrease in capital structure when gender diversity went up by 1. In *Table 4*, due to the addition of interaction term, the coefficient of Gender Diversity now only displays the relation between Gender Diversity and Capital Structure of non-financial firms (respectively -0.276 in the fixed effects regression). In order to calculate the coefficient of Gender Diversity on Capital Structure of financial firms the coefficient of the interaction term has to be added, which adds up to a Gender Diversity coefficient of -1.270 in the fixed regression estimation. The statistically significant interaction term (FinxBGD) basically indicates that Gender Diversity has a larger negative effect on capital

structure in financial firms, relative to non-financial firms. This is exactly the opposite relation from which is predicted in the second hypothesis of this thesis, which predicts that non-financial firms will show a significant negative effect between gender diversity and capital structure, while the financial panel was predicted to show a significantly weaker negative/non-existent effect. This prediction was based on the theory that while women might generally show more risk-averse behavior, this effect would be greatly diminished/nonexistent on the condition that they are active in the financial sector (Adams & Ragunathan, 2015; Hibbert et al., 2013).

4.2 Robustness Tests

4.2.1 Exclusion of UK firms

Referring back to *Figure 1,* it has to be noted that almost 50% of the sample consists of UK firms. This high representation of UK firms might significantly skew the results of the estimations. *Table A2* in the appendix provides the dummy and interaction (2) regression results of Panel A excluding UK firms. However, after halving the sample by reducing all the UK firms, the results seem to be roughly the same. The non-UK sample does show an even larger negative coefficient for Gednder Diversity, as well as the interaction term (FinxBGD), indicating an even bigger (negative) effect of board gender diversity on capital structure in the non-UK sample relative to the original sample. The signs of all the coefficients, as well as the significance levels of all the variables, do not seem to change. Altogether, it seems that even though the UK makes up roughly half of the sample, UK firms do not significantly alter the results of the sample as a whole.

4.2.2 Financial crisis effect

For the interpretation of the results, the timeframe of the sample has to be taken into account, especially if significant events have happened during this particular timeframe. During the timeframe of this sample (2000-2018) the financial crisis of 2007-2008 occurred, which has led to many changes in both the equity and debt markets forcing firms to adjust their financial strategies (D'Amato, 2019; Jermias & Yigit, 2019). Jermias and Yigit (2019) examined the relationship between fundamental variables and leverage before, during, and after a financial crisis, and found that the effect of these fundamental variables is somewhat affected by looking at a Turkish sample. Additionally, D'Amato (2019) examined Italian SMEs and found that a firm's significantly decrease their leverage levels after a financial crisis. So as a robustness test, a financial crisis

dummy has been adopted which has a value of 1 from 2009 and onwards, and 0 otherwise. In addition, a lag of 1 year has been applied to this dummy variable. This yields the following model:

(3) $(ST/LT)Capital\ Structure_{i,t} = \beta_0 + \beta_1 GedDiversity_{i,t} + \beta_2 Fin.Dummy_{i,t} + \beta_3 FinxBGD_{i,t} + \beta_4 Fin.Crisis_{i,t} + \beta_5 Board\ Size_{i,t} + \beta_6 Size_{i,t} + \beta_7 Age_{i,t} + \beta_8 Age_{i,t} + \beta_9 Profitability_{i,t} + \beta_{10} Growth_{i,t} + \beta_{11} Tax\ Rate_{i,t} + \beta_{12} Tangibility_{i,t} + \beta_{13} EFI_{i,t} + \beta_{14} GDP/Capita + \varepsilon$

i = firm indicator, t = year indicator

Referring to *Table 5* it seems that the financial crisis dummy has a significantly negative effect on capital structure, indicating that both financial and non-financial companies have resorted to lowering capital structure levels after the financial crisis. This is in line with the findings of D'Amato (2019). Additionally, the effect of gender diversity on capital structure seems to have diminished: while still displaying a negative coefficient, gender diversity is no longer statistically significant for the dependent variables capital structure and LT capital structure. This indicates that a large part of the gender diversity coefficient in the regressions in *Table 4*, have been absorbed by the Financial Crisis variable. One possible explanation for this result is that during the period of 2000 to 2018, relatively more women have joined corporate boards through the years due to an increase in public interest regarding gender equality leading to increased regulation and quotas (Kirsch, 2018). This relative increase in women on the boardroom, coupled with a decrease in capital structure due to the aftermath of the financial crisis, might have resulted in a negative coefficient between these two variables. The findings regarding the negative effect of gender diversity on capital structure (hypothesis 1) are thus greatly diminished when controlling for the financial crisis.

The interaction term however, stays statistically significant with a negative coefficient over the models. While not in line with the predicted second hypothesis, it does add robustness to the results provided in *Table 4.* Additionally, the control variables do not seem to have changed very much with respect to their signs, significance, or intensity.

TABLE 5. FINANCIAL CRISIS DUMMY (3) REGRESSION RESULTS

Panel A:	Fixed Effects Regression			Random Effects Regression		
Variables	CapStructure[a]	STCapStructure[a]	LTCapStructure[a]	CapStructure[a]	STCapStructure[a]	LTCapStructure[a]
Gender Diversity	-0.103	-0.068**	-0.039	-0.118*	-0.083***	-0.027
	(0.068)	(0.027)	(0.044)	(0.061)	(0.025)	(0.040)
Fin. Dummy	-	-	-	0.483***	0.251***	0.184***
				(0.044)	(0.019)	(0.028)
FinxBGD	-0.991***	-0.278***	-0.594***	-0.636***	-0.135**	-0.444***
	(0.155)	(0.065)	(0.100)	(0.141)	(0.059)	(0.091)
Fin. Crisis[b]	-0.148***	-0.048***	-0.091***	-0.158***	-0.062***	-0.085***
	(0.016)	(0.006)	(0.010)	(0.013)	(0.005)	(0.008)
Board Size	-0.002	-0.002*	0.000	-0.003	-0.001	-0.001
	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Size	0.196***	0.043***	0.135***	0.194***	0.048***	0.133***
	(0.010)	(0.004)	(0.006)	(0.006)	(0.003)	(0.004)
Age	-0.025	-0.007	-0.004	-0.040***	0.002	-0.036***
	(0.021)	(0.009)	(0.014)	(0.012)	(0.005)	(0.008)
Profitability	-0.011***	-0.002	-0.007***	-0.011***	-0.002*	-0.007***
	(0.003)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)
Growth	0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tax Rate	-0.000	-0.000	0.000	-0.001	-0.000	0.000
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Tangibility	0.362***	0.127***	0.240***	0.287***	-0.021	0.339***
	(0.056)	(0.023)	(0.036)	(0.042)	(0.018)	(0.027)
EFI	-0.007**	-0.005***	-0.001	-0.014***	-0.007***	-0.006***
	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
GDP/Capita	-0.190**	-0.139***	-0.052	-0.106**	-0.106***	-0.003
	(0.088)	(0.036)	(0.057)	(0.046)	(0.019)	(0.029)
Constant	0.899	1.506***	-0.545	0.558	1.291***	-0.650**
	(0.922)	(0.374)	(0.598)	(0.467)	(0.197)	(0.299)
Financial Dummy	OMITTED	OMITTED	OMITTED	YES	YES	YES
Interaction	YES	YES	YES	YES	YES	YES
F. Crisis Dummy	YES	YES	YES	YES	YES	YES
R^2 - Within	0.018	0.009	0.0188	0.0176	0.0074	0.0182
Overall	0.1358	0.0531	0.1560	0.1622	0.1108	0.1720
Observations	37,586	36,926	37,484	37,586	36,926	37,484

Note: The table presents regression results of panel A using the econometric model given in equation (3). The values represent the coefficient of the variable in question, while the value in parentheses beneath those indicate the standard error. ***, **, *, represent statistical significance at the 1%, 5% and 10% level respectively.

[a] The capital structure variables are winsorized at the 2nd and 98th percentile.
[b] The financial crisis dummy has been lagged by 1 year.

5. Conclusion and Discussion

This thesis investigated the relationship between gender board diversity and capital structure in firms located in mostly European countries, using data collected from 4704 firms over a course from 2000 until 2018. A baseline econometric model was created in order to study this relationship. Additionally, a second econometric model was constructed with the inclusion of a financial dummy and interaction term in order to analyze the difference between financial and non-financial firms.

Although capital structure has been widely explored in the financial literature, to the author's knowledge, none have used a sample which includes both financial and non-financial firms. This new sample thus allows the investigation between these two different sectors, including the suspicion that the effect of gender board diversity on capital structure is mitigated in the financial sector. This thesis thus provides new empirical evidence regarding the impact of gender diversity on capital structure. It also provides some evidence towards the pecking order theory.

Firstly, in line with the existing literature, the results reveal that an increase in gender board diversity has a negative correlation with capital structure. These results seem to be in agreement with both Adusei and Obeng (2019), and Alves and Ferreira (2011), who also find the same negative correlation. However, the results decrease in both severity and significance when controlling for the financial crisis of 2008. This indicates that a large part of the negative correlation between gender board diversity and capital structure in the data is due to this omitted variable. Both Adusei and Obeng (2019), and Alves and Ferreira (2011) fail to capture this relationship, because their samples cover a timeframe of 2010 to 2014, and 1991 up to 2001 respectively. So regarding the first hypothesis, while a general (negative) tendency has been observed, it cannot be concluded that gender board diversity has a significant negative effect on the capital structure of a firm without further research.

The second hypothesis, does not seem to match up with the results found in this thesis. Adams and Ragunathan (2015) and Hibbert et al., (2013) found that whereas women generally show more risk averse behavior relative to men, this effect seems to disappear conditional on being in the financial industry. It was thus speculated that this effect would translate to a weaker effect of gender diversity on capital structure in financial firms relative to non-financial firms. However, the results reveal the complete opposite relation: gender diversity seems to have a larger effect on capital structure in financial firms. This effect remains statistically robust even when taking into account the financial crisis dummy. It can be concluded that a strong (negative) tendency exist between the effect of gender board diversity on capital structure in financial firms relative to non-financial firms.

The implications of this research are limited. Since data availability due to the BoardEX database resulted in a sample consisting of mostly prosperous European countries. This could mean that the results are only applicable to this biased sample, and do not properly represent the results of a random sample. The findings in this paper cannot be generalized to different settings without

proper consideration. In addition, this thesis does not account for the problem of reverse causality. While this study aims to investigate the effect of board gender diversity on capital structure, the opposite relationship is also possible: female (risk-averse) directors might self-select themselves into lower-risk firms, while not directly influencing the financing strategy of that firm (Sila, Gonzalez, & Hagendorff, 2016). Furthermore, while this thesis provides some small evidence towards the pecking order theory by showing that a decrease in information asymmetry results in a relative increase in the use of equity, in depth conclusions cannot be drawn regarding this theory due to the scope of this thesis and the nature of the capital structure variables used.

The above limitations of this paper suggests some improvements for future research. Future research could implement a more diversified sample to increase the generalizability of the results, and further look into the problem of reverse causality. Additionally, the results of this paper reveal a tendency that board gender diversity has a stronger effect in financial firms relative to non-financial firms, which go against the reasoning provided in this thesis. Further research focused on this matter is needed to explain this peculiar effect. Furthermore, future research could use a different set of capital structure variables, and provide a more in depth analysis regarding the pecking order theory.

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7. Appendix

TABLE A1 – STATISTICAL TESTS

Panel A	Capital Structure Variable	Breusch-Pagan Lagrange Multiplier test	Hausman Test
Table 3 – (Model 1)	Original	Prob>Chibar2 = 1.0000	Prob>Chi2 = 0.9126
	Winsorized	Prob>Chibar2 = 0.0000	Prob>Chi2 = 0.0000
Table 4 – (Model 2)	Original	Prob>Chibar2 = 1.0000	Prob>Chi2 = 0.9409
	Winsorized	Prob>Chibar2 = 0.0000	Prob>Chi2 = 0.0000
Table 5 – (Model 3)	Original	Prob>Chibar2 = 1.0000	Prob>Chi2 = 0.9264
	Winsorized	Prob>Chibar2 = 0.0000	Prob>Chi2 = 0.0000

Note: The table presents the results of the statistical tests performed on the regressions. Both the winsorized and the original (unwinsorized) capital structure variables are used as the dependent variable.

TABLE A2 – (TABLE 4 EXCLUDING UK FIRMS)

Panel A:	Fixed Effects Regression			Random Effects Regression		
Variables	CapStructure[a]	STCapStructure[a]	LTCapStructure[a]	CapStructure[a]	STCapStructure[a]	LTCapStructure[a]
Gender Diversity	-0.535***	-0.162***	-0.350***	-0.552***	-0.225***	-0.296***
	(0.088)	(0.039)	(0.057)	(0.077)	(0.034)	(0.050)
Fin. Dummy	-	-	-	0.805***	0.501***	0.270***
				(0.072)	(0.033)	(0.047)
FinxBGD	-1.273***	-0.547***	-0.632***	-1.013***	-0.415***	-0.545***
	(0.197)	(0.090)	(0.129)	(0.184)	(0.084)	(0.119)
Board Size	0.001	-0.002	0.001	-0.002	-0.001	-0.001
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Size	0.303***	0.070***	0.209***	0.257***	0.074***	0.168***
	(0.017)	(0.007)	(0.011)	(0.011)	(0.005)	(0.007)
Age	-0.198***	-0.077***	-0.084***	-0.100***	-0.022**	-0.069***
	(0.035)	(0.015)	(0.023)	(0.019)	(0.009)	(0.012)
Profitability	-0.017	-0.007	-0.011	-0.022**	-0.009*	-0.013*
	(0.011)	(0.005)	(0.007)	(0.011)	(0.005)	(0.007)
Growth	-0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tax Rate	-0.001	-0.000	0.000	-0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tangibility	0.490***	0.173***	0.346***	0.199***	-0.134***	0.370***
	(0.097)	(0.044)	(0.064)	(0.070)	(0.032)	(0.045)
EFI	-0.005	-0.004**	-0.003	-0.015***	-0.008***	-0.007***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)
GDP/Capita	-0.394***	-0.197***	-0.190***	-0.106*	-0.110***	0.001
	(0.111)	(0.049)	(0.073)	(0.059)	(0.027)	(0.038)
Constant	1.997*	1.994***	0.228	-0.022	1.114***	-0.953**
	(1.150)	(0.508)	(0.750)	(0.586)	(0.265)	(0.379)
Financial Dummy	OMITTED	OMITTED	OMITTED	YES	YES	YES
Interaction	YES	YES	YES	YES	YES	YES
R^2 - Within	0.0259	0.0127	0.0256	0.0245	0.0088	0.0248
Overall	0.1277	0.0483	0.1324	0.1777	0.1783	0.1495
Observations	20,942	20,528	20,908	20,942	20,528	20,908

Note: The table presents regression results of panel A with the exclusion of UK firms, using the econometric model given in equation (2). The values represent the coefficient of the variable in question, while the value in parentheses beneath those indicate the standard error. ***, **, *, represent statistical significance at the 1%, 5% and 10% level respectively.

[a] The capital structure variables are winsorized at the 2nd and 98th percentile.

TABLE A3 – VARIABLES, DEFINITIONS, AND NOTATIONS

Variable	Definition	Notation	Data Source
Dependent variable			
Capital Structure	Total debt divided by total shareholders' equity	CapStructure	Eikon
Short term Capital Structure	Short term debt divided by total shareholders' equity	STCapStructure	Eikon
Long term Capital Structure	Long term debt divided by total shareholders' equity	LTCapStructure	Eikon
Independent variable			
Board Gender Diversity	% of female board members	Gender Diversity	BoardEX
Financial dummy	Binary = 1 if SIC code starts with 6, 0 otherwise	Fin. Dummy	Eikon/Orbis
Interaction term (between board gender diversity and financial sector)	Financial dummy times board gender diversity	FinxBGD	-
Firm specific controls			
Board Size	Amount of directors on the board	Board Size	BoardEX
Size	Natural logarithm of (total assets +1)	Size	Eikon
Age	Natural logarithm of (age +1)	Age	Eikon/Orbis
Profitability	EBITDA divided by total assets	Profitability	Eikon
Growth	Year to year % growth in net sales/revenues	Growth	Eikon
Tax Rate	Income tax divided by EBIT	Tax Rate	Eikon
Tangibility	Property, plant and equipment divided by total assets	Tangibility	Eikon
Country specific controls			
Creditor Rights	Economic Freedom Index score	EFI	The heritage foundation
Economic Development	Natural logarithm of GDP per capita	GDP/Capita	Eurostat