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Gender diversity and its impact on firms' financial performance

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Abstract

In this research, we examine if there exists a link between board gender diversity and financial performance, hereunder what is believed to be the very worst of financial performance – bankruptcies. After the gender balance law was introduced in Norway in 2003, researchers found a negative link between gender diversity and ASA-firms' financial performance. Firms with the organizational form of AS has in the same period experienced a natural increase in female board members but have not been researched against the financial performance until now. We therefore provide valuable additions to the literature on this topic and our findings show that the increased female presence positively affected financial performance of AS-firms (which is the opposite result on ASA-firms). This result is robust to various means of measure and prove that, when not forced by law, gender diversity creates more value for the shareholders. We therefore suggest that the gender balance law on ASA-firms is ready for modification, and that the Norwegian government should be careful trying to implement the quota for AS-companies in the future. Besides, we find that gender diversity is positively linked to the long-term survival of AS-firms. The results show that if the board is all-female or all-male, the predicted probability for bankruptcy is larger than for firms with gender diverse boards. This result indicates that zero gender diversity increases the chance of being a bankrupt firm, and therefore, we in addition prove that gender diversity is a positive factor in long-term survival of firms.

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1 Introduction and Background

In this research paper we aim to investigate whether Norwegian companies with female board members perform better than those without female board members. Additionally, based on the general conception that firms with deteriorating financial performance are believed to be more likely to file for bankruptcy, we will also investigate whether female presence on Norwegian boards impact the probability of firms filing for bankruptcy.

The two primary organizational forms for limited liability companies in Norway today are ASA (allmennaksjeselskap) and AS (aksjeselskap). These two organizational forms are much alike but have significant differences. Companies with the organizational form of ASA can be listed on the stock exchange and have by law more criteria concerning board characteristics (Allmennaksjeloven, 1997). On the other side, companies with the organizational form of AS cannot be listed and have more freedom in their board composition (Aksjeloven, 1997). In 2003, one of the most substantial differences concerning the two organizational forms took place. The Norwegian government passed the gender balance law (GBL), a mandatory board gender quota. The law stated that 40% of each gender were to be required on ASA-boards, and companies had to comply by 2008 (2006 for new companies). This law imposed a rapid transformation, and the number of female directors on ASA-boards rose from 7% in 2003 to over 40% by 2008[1].

According to The World Economic Forum (2017) Norway is the second most gender-equal country in the world. One reason for this, provided by Forbes.com is the family-friendly policies that help both men and women to better thrive in the workplace (Zalis, 2018). One example is paid parental leave for fathers, as well as mothers. Because more family and household care are equal between genders, it opens for more females taking on top-management positions and reach for the board room. However, breaking the barriers of reaching the board room is not only about having it easier at home. In Norway, the GBL increased the number of females in ASA-company boards. This increase is positive, but only promoting women because the companies must follow the law is not. Consequently, it could lead to

[1] For statistics, see table 3.3 in chapter 3.5 Descriptive statistics.

the exclusion of the most qualified candidate (if those are male), which again could hurt the company.

Traditionally, researchers have investigated other board characteristics, such as board size, tenure, age, or industry (Adams & Ferreira, 2007). However, in the aftermath of the GBL, researchers have also investigated if board gender diversity[2] influences financial performance. The reasons for this are mainly due to one important aspect. Should companies be more gender diverse, because it is the right thing to do, or should companies be more gender diverse because it is good for the company? (Carter, Simkins & Simpson, 2003). It is not questioned that diversity is the ethically or socially right thing to do (Harjoto, Laksmana & Lee, 2014). However, a strong argument for increasing gender diversity could be made if it enhanced financial performance, as well as equality. Besides, there has been considerable progress in the last century concerning women's rights and inequality, but females are still underrepresented in top business positions all over the world (European Commission, 2019) Therefore, the findings in this research might provide insights that affect both firms and society profoundly.

The literature on Norwegian ASA-companies after the GBL shows a negative link between the female increase and financial performance. This link will be discussed more in the next chapter. However, similar research on AS-companies in Norway is lacking. Even though such companies have not been eligible under the same law regarding gender composition, they have still experienced increased gender diversity on the boards[3]. This increase has been "natural", meaning there is no law forcing it. Therefore, females on AS-boards are believed to have earned their place by being the most qualified candidate. Consequently, we aim to investigate if this natural increase still gives the same results as under the GBL, or if a natural and free process of board selection leads to better financial performance.

Additionally, ASA-companies are only about 213 of the largest companies in Norway. This number is a small sample compared to the over 320.000 AS-

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[2] Gender diversity is defined as the variety inherent in the board composition, which in other words means how balanced the board is of each gender(Campbell & Minguez Vera, 2009)
[3] See Figure 3.4 in chapter 3.

companies of different sizes that exist all over Norway (SSB, 2019). Therefore, this paper will focus on a far larger sample of companies, which will strengthen the results. The Norwegian government is also debating whether the GBL should be enforced on larger AS-companies as well. Consequently, if implemented, the effects might influence a more significant number of companies and people. Therefore, it is even more important to look at what effects increased gender diversity has had on AS-firms.

Furthermore, the number of companies filing for bankruptcy in Norway increased by 10.6% from 2017 to 2018. The total number of filings for AS was over 3.700 companies in 2018, the highest since the financial crisis in 2009 (KommuneProfilen, 2017). Even though the number of filings per 100 companies is steadily decreasing, the number of filings is still significant, considering the Norwegian economy has been solid the past years. Therefore, we also want to look at what is believed to be the very worst of financial performance – bankruptcies. To our knowledge, this will be the first contribution to the literature on board gender diversity and bankruptcies internationally, and in Norway. We are confident this is of great value, because bankruptcies impact both local, national and global economies, ultimately affecting the world around us.

Therefore, this paper will be of great interest for multiple reasons. First, there are several previous investigations on ASA-companies, but literature on AS-companies is highly limited. Second, the Norwegian government is debating if the GBL also should be applied to AS-companies as well, so new evidence could affect new possible legislative actions. Lastly, many firms file for bankruptcy in Norway each year, and research on the field can contribute to understanding if gender diversity is a factor in long-term survival.

2 Literature review and theoretical framework

In 2003, the Norwegian government was ground-breaking when they introduced the gender balance law for ASA-companies (Bøhren & Staubo, 2013). By 2008, ASA-firms were to have at least 40% representation of each gender on their boards.

Since then, other countries have followed internationally with similar quotas[4], such as Spain, Iceland, France, Belgium, Netherlands, Italy, and Germany (Regjeringen, 2017). Many researchers have since the implementation in Norway, and other European countries, questioned whether an increased representation of female board members had beneficial financial effects on firms. Therefore, literature and discussions on the topic are vast. However, because quotas are quite new, most research is on firms not under any quotas. Table 2.1 shows an overview of the central literature on the topic.

Table 2.1: Literature Overview

This table shows previous literature done on gender diversity and firm's performance in chronological order by year. In this table we have selected the most relevant and cited literature on the topic. See Table 8.1 in Appendix for full review. The research papers presented are from 2003 to 2017.

Authors	Year	Area	Period	Company Type	Quota	Link
Giordini & Rancati	2017	Italy	2011-2014	Public/Listed	Yes	Positive
Reguera-Alvarado	2017	Spain	2005-2009	Public/Listed	No	Positive
Christiansen et al.	2016	34 European countries	2013	Non-listed	Both	Positive
Terjesen, Cuoto & Fransisco	2015	47 countries	2010	Public/Listed	Both	Positive
Joecks, Pull & Vetter	2013	Germany	2000-2005	Public/Listed	No	Negative until 30% women then positive
Lückerath-Rovers	2013	Netherlands	2005-2007	Public/Listed	No	Positive
Matsa & Miller	2013	Norway	2002-2009	Public/Listed	Yes	Negative
Ahern & Dittmar	2012	Norway	2001-2009	Public/Listed	Yes	Negative
Bøhren & Strøm	2010	Norway	1989-2002	Public/Listed	No	Negative
Carter et al.	2010	US	1998-2002	Public/Listed	No	No link
Haslam et al.	2010	UK	2001-2005	Public/Listed	No	No link on ROE & ROA, negative with Tobin's Q
Adams & Ferreira	2009	US	1996-2003	Public/Listed	No	Negative
Miller & Carmen Triana	2009	US	1995-2000	Public/Listed	No	Positive
Campbell & Mínguez-Vera	2007	Spain	1995-2000	Public/Listed	No	Positive
Rose	2007	Denmark	1998-2001	Public/Listed	No	No link
Randöy, Oxelheim & Thomsen	2006	Norway	1996-1998	Public/Listed	No	No link
Smith, Smith & Verner	2006	Denmark	1993-2001	Public/Listed	No	Positive
Erhardt, Werbel & Shrader	2003	US	1998	Public/Listed	No	Positive

[4] See Table 8.2 in Appendix for an overview of gender quotas in different countries.

Research on the GBL shows that, from an equality standpoint, the quotas worked in increasing the percentage of females on the board itself. However, this did not increase gender diversity in other positions, and females are still underrepresented among top leadership positions in Norway, such as CEO, executives, or chair of the board (Langli, 2011). Many believe this to be due to the glass ceiling – "the invisible, yet unbreakable barrier that keeps minorities and women from rising to the upper rungs of the corporate ladder, regardless of their qualifications or achievements" (Federal Glass Ceiling Commission, 1995). Consequently, supporters of board gender quotas believe quotas to be the only instrument in breaking the glass ceiling in order to create equal opportunities for females on the top level. Thus, the objective of gender quotas is argued to be equality primarily, and that other effects, such as the financial performance of the firm, are secondary concerns.

However, critics of the GBL and board gender quotas have emphasized that the underrepresentation of females might be due to females' own choices regarding career, education, motherhood or family. Thus, that there does not exist a systematic discrimination (or glass ceiling) of gender for board selection (only the potential board members own preferences and qualities). For example, Ahern and Dittmar (2012) argue that if highly qualified females are not found, gender quotas could lead to negative financial effects and adverse stock market reactions. This is closely linked to the resource dependence theory as developed by Pfeffer and Salancik (1978), which is the ability of the board to bring beneficial resources to the firm (i.e., expertise, skills, knowledge, reputation or networks). Historically, resources from board members were less critical and boards were more like a "country club". This has however changed over the decades, and potential board members skills or resources are valued more today. The theory argues that females can bring new and other qualities than men to the board, but also that setting restrictions in the board structure can limit and thus, harm what qualities found on the board (Platt & Platt, 2012). This is further connected to the agency theory, which states that the boards monitors the managers on behalf of the shareholders, and thus, the shareholders should be able do chose who has the right qualities in doing the monitoring for them (Hillman & Dalziel, 2003).

Therefore, many researchers have tried to find out if the GBL in Norway has had any significant effects on the performance of the firms under the law. In Norway, researchers find a negative link between the increase of female presence as imposed by law. Bøhren and Strøm (2010) found that low gender diversity creates more value for the company's owners and conclude that they cannot find any reason for requiring by law a minimum fraction of each gender on the board. However, they do argue that such schemes might be beneficial for society, but that they cannot defend it from a stockholder perspective. Similarly, Ahern and Dittmar (2012) show that the quota led to "younger and less experienced boards, increased leverage and acquisitions, and deterioration in operating performance", which further caused a negative market reaction. Matsa and Miller (2013), also find that affected firms undertook fewer workforce reductions and had increased relative labor costs, which led to reduced short-term profits in the aftermath of the GBL.

However, looking to Spain, the second country in the world to enforce a board gender quota, we find the opposite results. Reguera-Alvarado (2017) find that the increased number of females on the board led to an overall positive economic outcome for the firms affected. Campbell and Mínguez-Vera (2007), furthermore found that the stock market reacted positively on female board appointments, suggesting that investors consider female directors to add value in Spain. This result is interesting, but the difference between Norway and Spain might be because there are different countries and cultures analyzed, and that the research in Spain was performed only after the law was passed, but before the companies had complied with the 40% quota fully. Additionally, in Norway, companies were threatened to be dissolved if not complying, while in Spain, there were no sanctions in place.

These findings suggest that in terms of bringing on the most qualified board members, the quotas might not have done the companies in Norway any favor besides increasing the number of females. Similar research has, however, not been thoroughly investigated regarding AS-companies in Norway. The reason is simply that AS-companies have not been eligible under the same law. However, in the same period, there has been a natural increase in female presence on the board. Therefore, in accordance with the resource dependence theory, assuming that shareholders are optimizing the board in relation to who is the most qualified, we question if the natural increase of female board members in AS-companies, increases the financial performance of the firm. Thus, our first hypothesis is:

Hypotheses 1: Norwegian AS-firms with greater board gender diversity perform better than those with low board gender diversity.

This hypothesis is also supported by research from countries not under any board gender quotas (at the time of the studies). We find a positive link between females and financial performance in the Netherlands (Lückerath-Rovers, 2013), United States (Erhardt, Webel & Shrader, 2003; Miller & del Carmen, 2009), Germany (Joecks, Pull & Vetter, 2013), Italy (Gordini & Rancati, 2017), Denmark (Smith, Smith & Verner, 2006) and in multinational studies with several countries (Terjesen, Couto & Francisco, 2015; Christiansen et al., 2016). The research has suggested several arguments for why increased gender diversity leads to better financial performance. First, female characteristics such as females being more risk-averse (Croson & Gneezy, 2009; Byrnes, Miller & Schafer, 1999), females have better board attendance records (Adams & Ferreira, 2009), females are less aggressive in pricing strategies and are more concerned for social sustainability (Apesteguia, Azmat & Iriberri, 2012). Second, female directors might also give legitimacy to the firm. For example, customers or partners might prefer or demand that the firm they do business with have female representation (Hillman, Shropshire & Cannella, 2007). Third, increased gender diversity is associated with increased focus on CSR and environment (Bear, Rahman & Post, 2010) and enhanced firm innovation (Torchia, Calabrò & Huse, 2011), which are all drivers for a firm's financial performance.

However, other researchers point out that females in management positions might differ from females in the general population (Croson & Gneezy, 2009). Although the common belief is that females are more risk-averse than males, Adams and Funk (2012) found that female directors might even be more risk loving, and that gender stereotypes might not be satisfied by professional business women. Therefore, business women might be an exception to the rule that females are more risk-averse than men, showing that females do not necessarily lead to more risk-averse decision making. Croson and Gneezy (2009), suggest that this exception can be a consequence of that female who pursue managerial positions are more similar to males in risk-taking behavior and/or adapt to their work environment.

Additionally, Read (1998) presents several problems facing female-owned small companies and points to multiple studies in her book. This is important in our research because many of the AS-firms in Norway are small female-owned companies, where the owner and/or CEO also is female. Read points out that female businesses are more likely to suffer from problems regarding paperwork, raising capital, and chasing bad debts (Simpson, 1991). Another study discussed by Read was that running a business involved long hours, and that this might not fit with home-duties of being a wife/mother (Cromie & Hayes, 1988), and that females more often meet “doubts and disapproval” from their spouse or family (Cannon & Carter, 1992). Moreover, it was discussed that female-dominated businesses might lack credibility and problems regarding authorities because of the preconceptions from male business partners or co-workers (Cannon & Carter, 1992). Therefore, female-dominated companies are suggested not to be the best fit either (as compared to male-dominated companies). It is uncertain if these arguments still hold, since the literature is 20-30 years old and the gender equality has been strengthened since then. Either way, this point supports the hypothesis that a mix of genders is likely to be the best driver for financial performance.

Furthermore, many companies go bankrupt each year, and we wonder if gender is a factor in this as well. If the first hypotheses prove to be right, and that a gender diverse firm increases financial performance, then a less gender diverse firm should have a higher probability of bankruptcy. To our knowledge, board gender diversity on bankruptcies has never been fully investigated internationally or in Norway, but the literature suggests that corporate governance structures play a key role in predicting bankruptcies (Liang et al., 2016). Findings show that companies are less likely to stay out of bankruptcy if the board is independent (members not employed by firm), the boards are larger and if the directors are older. This is also linked to the resource dependence theory, in that more board members and older age often means more experience. Using the same argument as under the first hypotheses, suggesting that AS-companies in Norway has experienced a natural female increase because the females have the necessary skills, experience and/or resources to be on the board, then increased gender diversity should also decrease the chance of bankruptcy. Thus, we hypothesize that:

Hypotheses 2: Firms with one or more females on the board are less likely to go bankrupt than firms without females on the board.

3 Data and Descriptive Statistics

3.1 The Sample

Our descriptive and quantitative study will mainly use archival data. With the help of our supervisor, we have gained access to secondary data from the Center for Corporate Governance Research (CCGR). The dataset contains high quality and detailed accounting information, as well as comprehensive ownership and data of both ASA and AS-firms in Norway. With the possibility of extracting data on AS-firms, we have gained access to a large sample, consisting of roughly four million observations from the years 2000-2017. We have used consolidated numbers when available, and accounting numbers when consolidated numbers are missing.

Before reaching our final sample, we used some time cleaning our dataset. We removed missing variables[5] and to remove outliers we winsorized our accounting variables on both sides at the 1% level. After that, we excluded financial and insurance industries, because of their special capital requirements and accounting rules, in line with common practice. We also removed inactive firms[6] and firms with inconsistent accounting data[7]. We did not adjust for companies leaving or entering the dataset during the period because of the hypothesis regarding bankruptcies, and thus the dataset is unbalanced. We also merged our initial dataset with an additional dataset from CCGR with information about bankrupt companies.

[5] Missing variables are random, not systematic.
[6] Firms with zero assets and an average of zero in revenue are removed. By using the average, we take into account that some firms can have a bad year with zero in revenue, or zero in revenue in the beginning of business, as for example start-ups. We have not excluded firms with zero employees, since we do not have any data of number of employees after year 2006.
[7] Firms with negative fixed assets, negative current assets, negative current liabilities, negative long-term liabilities, negative dividends, negative depreciation and firms for which the sum of assets did not equal the sum of total liabilities and equity (balance-equation).

From this, we found that between 2-3% of the companies in our dataset were forcibly dissolved each year, which will be discussed more under chapter 3.5.

Lastly, we derive at an unbalanced panel data of 2,083,692 observations from Norwegian ASA and AS-firms in the period 2000 to 2017. The number of companies observed varied from around 105.000 companies in the starting years of our dataset to 170.000 companies at the end of our dataset. This is a far larger sample than in previous research, which mainly has been looking at between 100-500 ASA-companies. We believe this will strengthen our research.

3.2 Measure of Financial Performance

Return on assets (ROA) as a proxy for financial performance in this research. This measurement is widely used in previous research and is an indication of how effectively the firm is utilizing its assets in generating earnings for their shareholders (Carter et al, 2010). ROA is defined as:

$$ROA_{i,t} = \frac{Net\ Income_t}{\frac{(Total\ assets_t + Total\ assets_{t-1})}{2}}$$

Many researchers have also used a stock-based marked measure called Tobin's Q, which indicates whether a company's outstanding stocks are under- or overvalued, compared to the firm's assets. This measure reflects how the market values that firm right now and takes into account the potential believed success of the firm in the future (Haslam et al., 2010). This is contrary to ROA, which is based on how a company has performed in the past through its financial statements and balance sheets. In research, it seems to be a disagreement on which of these measures serves as the best proxy for financial performance. Therefore, many researchers use both to increase the robustness of the measures. Consequently, it would have been beneficial to use both measures, but AS-firms are privately owned and cannot be listed. Therefore, we only have the reported book values, and thus, we must use an accountancy-based measure such as ROA in this research.

3.3 Measure of Bankruptcy

As mentioned, the dataset was merged with information about forcibly dissolved companies in the same period. In Norway, companies can be forcibly dissolved in several ways. First, a company can be forcibly dissolved by the Norwegian courts because of insolvency (konkurs), which means that the company have an inability to pay debt which is not temporarily. Second, companies can also be compulsory liquidated (tvangsavviklet), which means that the company has submitted a notification of dissolution, but not submitted a final notification to the Register of Business Enterprises (Foretaksregisteret). Lastly, a company can be compulsory dissolved (tvangsoppløst), which means that the company has not submitted notification about important information required by law. Examples of this includes lack of board, lack of auditor or if a company fails to submit financial statements within the required timeline (Konkursrådet, 2011). Therefore, forced dissolution of a company can be caused by several things, but they all have in common that they will go under bankruptcy proceedings (konkursåpning). Thus, in this research, bankruptcy as a definition will have a broader meaning than just insolvency, also taking into consideration neglect of corporate obligations. Therefore, the use of bankruptcy and forcibly dissolved will be used and mean the same in this research.

Based on previous literature that focuses on building logit models, our dependent variable will be a bankruptcy dummy variable (Rauterkus, Rauterkus & Munchus, 2013). It will take the number one if the company has been forcibly dissolved that year, or zero otherwise. Initially, our analysis will first be limited to determine if there is an association between board gender diversity and bankruptcy. After this, it will also be appropriate to look at a lagged model, where the explanatory variables will be analyzed not in the same year, but the year before the bankruptcy. The reason for this is that bankruptcies are not something that happens overnight and are, as argued by Hambrick and D'Aveni (1988), a late stage of a "protracted process of a decline" and a "downward spiral". Therefore, management would seem to have some opportunity to correct such downward trends in advance. In addition, the process of bankruptcies can also take some time before the company is dissolved. Therefore, it will be appropriate to include results from a lagged model in addition.

3.4 Explanatory Variables of Interest

3.4.1 Diversity

The measurement of diversity on boards have been done in a variety of ways in previous studies. The most common ways are dummies for female presence, the percentage of females on the board, and the Shannon and Blau's index[8]. For our research, we will use the percentage of females on the board and a female dummy, indicating the presence of one or more females on the board. This is in line with the majority of previous research[9]. Maximum or perfect diversity in the board is considered an equal number of males and females, even though most gender quotas only aim at 40% or less gender diversity targets.

3.4.2 Control variables

Prior studies suggest that financial performance and probability of bankruptcies are related to several other variables (Rahman, 2014). These include both firm and board specific variables, which will be included as control variables in this research.

In line with previous research, we use several common firm specific control variables. These comprise the size of the firm (Firm Size), measured as the natural logarithm of total assets, the age of the company (Firm Age), measured as the years since the firm's foundation and the debt level (Leverage) calculated as the total debt to total assets. Board specific variables include board size, measured as the number of members on the board (Board Size), the average age of the directors (Mean Age), and Tenure, which is measured as the number of years the current CEO has been employed. Additionally, we will also include an ownership variable of family-owned companies, which takes the value one if the company is ultimately owned by >90% of the same family, and zero otherwise.

[8] The Blau's index is calculated: $1 - \sum_{i=1}^{n} p_i^2 = 1$ and the Shannon index is calculated: $-\sum_{i=1}^{n} p_i^2 \ln p_i$ where Pi is the percentage of members in each category and n is the total number of board members. The minimum value of the Blau's and Shannon index is zero for both and respectively is the maximum value 0.5 and 0.69, when both genders are presented in equal proportions. (Stirling, 1998).

[9]96% of the studies uses a female percentage ratio as measurement, 33% of the studies uses female dummy, and 17% of the studies uses index as Blau's and/or Shannon. See Table 8.1 in Appendix for more information.

3.5 Descriptive statistics

Table 3.2 shows an overview of the empirical variables used in the research. The summary statistics only include those companies with the organizational form of AS. We will briefly comment on the most important.

Table 3.2: Descriptive statistics

This table shows the descriptive statistics of the firm variables used in the analysis. N is the number of observations, from only AS-firms. ROA is return on assets, measured as net income divided by the average of total assets. Bankruptcy is equal to 1 if the firm files for bankruptcy that year, zero otherwise. Female % is the percentage of female board members relative to the total number on board. Female dummy is equal to 1 if there are one or more female board members, zero otherwise. CEO Female is equal to 1 if CEO is female, zero otherwise. Firm Size is measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. Board Size is the number of board members. #Males is the number of males on the board. #Females is the number of females in the board. CEO Age is the age of CEO. Board Age is the mean age of all board members. Male Age is the mean age of male board members. Female Age is the mean age of female board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise.

Variable	N	Mean	Std. Dev	Min	Max
Dependent					
ROA	1,843,654	2.07%	0.00	-189%	97%
Bankruptcy	2,083,692	2.33%	0.15	0	1
Diversity					
Female %	2,083,692	0.16	0.29	0	1
Female Dummy	2,083,692	0.30	0.46	0	1
CEO Female	1,772,782	0.16	0.36	0	1
Firm specific					
Firm Size	2,072,478	14.54	1.83	6.90	26.15
Firm Age	2,077,276	11.38	12.21	0	170
Leverage	2,072,478	1.20	95.40	0	62668
Board, CEO & Ownership					
Board Size	2,083,692	2.22	1.34	1	15
# Males	2,083,692	1.83	1.24	0	13
# Females	2,083,692	0.39	0.68	0	10
Board Age	2,083,692	49.44	10.09	0	98
Male Age	1,932,669	50.18	9.79	18	98
Female Age	621,415	47.83	10.82	18	101
CEO Age	1,772,845	48.58	10.83	18	106
Tenure	1,842,220	6.83	5.24	1	21
Family-owned	2,083,692	0.82	0.39	0	1

The sample size is around 2.1 million, but as shown, several variables have a lower number of observations. The reason ROA shows a lower amount of observations is because it is calculated as an average by two years, and therefore each company misses the ROA in their first year in the dataset. Further, for AS it is optional to have a CEO. Therefore, in those companies it will be missing information such as gender and tenure on CEO. The firms in the sample are on average 11 years old. The table shows that on average during the whole period, the percent of females represented in the boardroom is 16%. The smallest boards in the sample have only one member, while the largest has 15 members. The mean board size is about 2.2 members, where there on average is 1.83 men and 0.39 females. The largest number of males on a board is 13, while for females the largest number is 10. The mean age of all board members (not regarding gender) is 49.5 years, while for the CEO, the mean age is 48.6. If adjusting for female and males, the mean age of female board members are 47.8 years, and male board members it is 50.2 years. The descriptive statistics also show that 82% of the sample can be classified as a family-owned company and that the tenure of the CEO is, on average, around seven years.

Table 3.3: Percentage of female board members by organizational form

This table shows the average percentage of female board members each year, from 2000 to 2017, for both organizational forms. Female % is the percentage of female board members relative to the total number on board. N is the number of observations each year. Total is the total number of observations. Average is the average percent of female board members for the years 2000-2017.

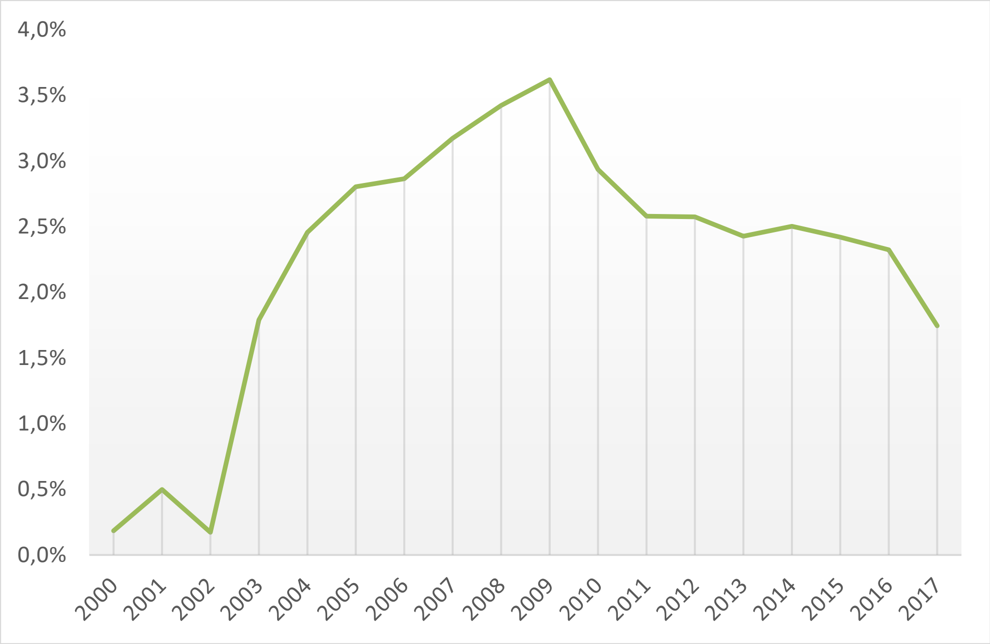
	AS		ASA	
Year	N	%	N	%
2000	85,076	14.0 %	263	4.9 %
2001	88,866	14.3 %	274	5.8 %
2002	91,804	14.6 %	249	6.7 %
2003	98,077	14.8 %	241	6.7 %
2004	100,893	15.4 %	232	15.0 %
2005	105,268	15.4 %	207	15.8 %
2006	111,048	15.7 %	213	21.6 %
2007	115,870	15.9 %	202	30.9 %
2008	117,530	16.1 %	184	39.5 %
2009	117,927	16.2 %	163	39.1 %
2010	118,848	16.3 %	160	40.4 %
2011	120,812	16.4 %	151	41.7 %
2012	128,433	16.9 %	143	40.5 %
2013	134,978	17.2 %	136	41.1 %
2014	136,907	17.6 %	129	41.4 %
2015	138,985	18.0 %	123	42.6 %
2016	139,855	18.2 %	117	42.5 %
2017	129,216	18.5 %	112	41.1 %
	Total	Average	Total	Average
	2,080,393	16.4 %	3,299	24.7 %

Over the period, 16.4% of boards in AS-firms were female. In ASA, the number is higher, with approximately 25%. ASA-firms had an extreme increase from 5% in 2000 to 41% in 2017 due to the GBL that requires 40% of the board to be female from 2008. We clearly see that the companies in our dataset complied with this, shown by the steep increase, leading up to this year in Figure 3.4. Even though AS-firms have not been under this law, they also have had an increase from 14% to 18% in the same period. This suggests, as discussed that there has been a natural increase of females represented in the boardrooms of AS-firms in our analysis period.

Figure 3.4: Percentage of females in the boards in AS and ASA-firms
The graph shows the evolution of the percentage of female board members for a sample of Norwegian AS and ASA-firms from 2000-2017. Percentage of female board members is measured as number of females on the board relative to the total number on board.

In addition, approximately 2.5% of the AS-firms in our dataset were forcibly dissolved from 2000 to 2017. In Figure 3.5, we see that there is a steady increase in bankruptcies leading up to the financial crisis in 2008-2009. After the increase, the bankruptcy rate has decreased and stabilized. Additionally, we see that information in the years 2000-2003 is 0% and 1%. After examining the dataset, we find that there are very few companies matched in our dataset that have gone bankrupt in these years. The reason for this is unknown, and we have a reason to believe many companies that were forcibly dissolved in those years might not have been included in the dataset. Also, we know that there was a large taxation reform that was announced in 2004 and fully implemented in 2006. This gave companies incentives in the year 2005 to do some last changes before the taxation reform was implemented in 2006. This could have affected the firms in our sample, and we therefore exclude firms before 2005 in the model for bankruptcy.

Figure 3.5: Percentage of AS-firms forcibly dissolved
This figure shows the percentage of AS-firms in our dataset that is forcibly dissolved each year, from 2000 to 2017. Female % is the percentage of female board members relative to the total number on board.



In addition, we also draw a random sample of 50% of the set used for analyzing bankruptcy. The reason for this is that a large number of observations and companies make it difficult to test and analyze the logit model efficiently, even after excluding the years before 2005. The sample size and companies are therefore reduced by the new time period and the random sample at 50%. In Figure 3.6 we provide an overview of the rate of bankruptcy comparing both the full and the randomly reduced sample from year 2005 to year 2017. As shown, the reduced sample is similar to the full sample when it comes to the percent of companies going bankrupt, and we will therefore use the reduced sample when testing our bankruptcy model in this research.

Figure 3.6: Percentage of bankrupt AS-firms, full sample versus reduced sample size
The figure shows the evolution of bankruptcies from 2005 to 2007, comparing the full sample against the reduced random sample of 50% of the set. Percentage of bankruptcies is measured as the number of firms who file for bankruptcy relative to the total number of companies in the sample.

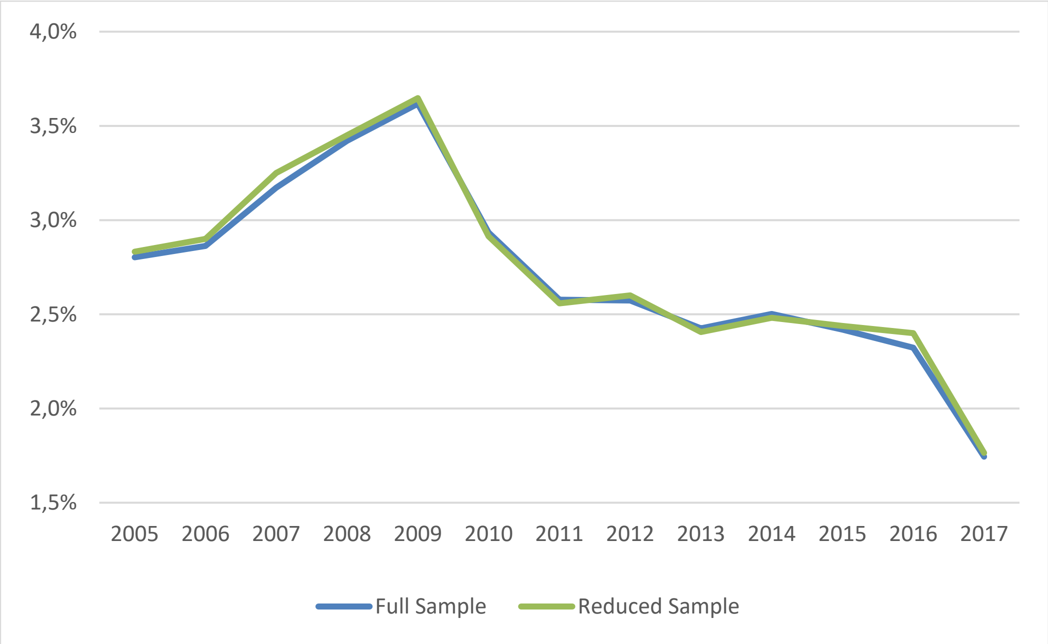
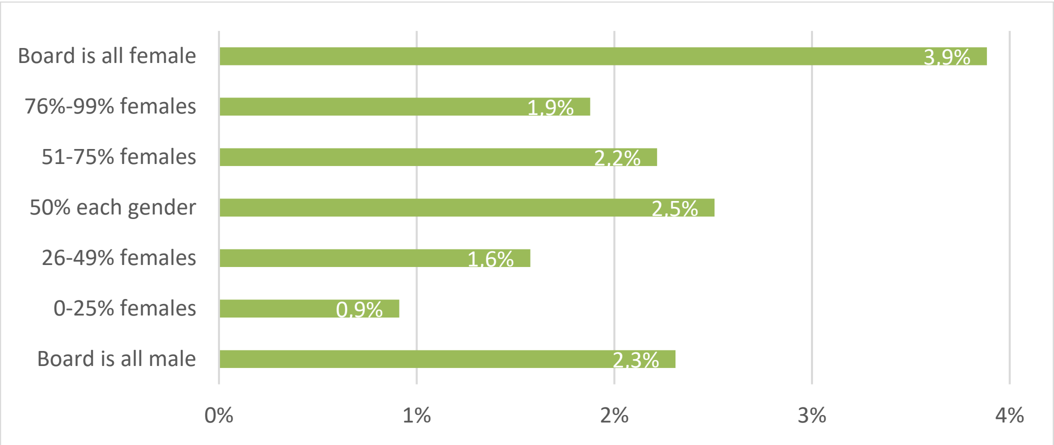


Figure 3.7: Percent of AS-firms forcibly dissolved by gender diversity levels
This figure shows the percentage of AS-firms forcibly dissolved by gender diversity levels from the year 2000-2017. Percentage of company forcibly dissolved is measured as the number of firms who is forcibly dissolved relative to the total number of companies in the sample. Percentage of female board members is measured as number of females in the board relative to the total number on board.



Furthermore, Figure 3.7 shows an overview of the forcibly dissolved companies by how many of each gender is on the board. As we can see, boards with all-female boards have a higher rate than all-male boards (3.9% and 2.3% respectively). In addition, when there is 50% of each gender on the board, the bankruptcy rate is higher than when the board is all-male. Therefore, companies with all-female boards represent a higher bankruptcy rate than all-male boards or gender mixed boards in our sample.

Lastly, regarding descriptive statistics, we present the correlation matrix of the variables. The results in Table 3.8 on the next page displays a few questionably high correlation values between the variables. The highest correlation is found between the percentage of females and the female dummy (0.86). This is obviously correlated, but it will not have any impact on our research because we will not use them simultaneously in our regression. Additionally, the CEO gender and the board gender variables (Dummy female and female %) have correlations of 0.6 and 0.46. We also see that the CEO age and the board age also correlate by 0.68. The reason for these correlations is that 90% of the CEO's are also present on the board. As a result, we will not use the CEO age or gender in our regression models due to multicollinearity. The rest of the variables are considered low on correlation and are therefore accepted with no multicollinearity in the chosen variables.

Table 3.8: Correlation matrix

This table shows the Pearson correlation coefficients for pairs of variables used in the empirical analysis. ROA is return on assets, measured as net income divided by the average of total assets. This is our measure of financial performance to a firm. Bankruptcy is an indicator variable that takes value 1 if the firm files bankrupt that year, zero otherwise. Female % is the percentage of female board members relative to the total number on board. Female dummy is an indicator variable that takes Value 1 if female board member(s), zero otherwise. CEO Female is an indicator variable that takes value 1 if CEO is female, zero otherwise. Board Size is the number of board members. CEO Age is the age of CEO. Tenure is the amount of years the current CEO has had the position. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. Firm Size is measured as the natural logarithm of total assets. Family-owned is an indicator variable that takes value 1 if ultimate ownership is >90% of same family, zero otherwise.

	ROA	Bankruptcy	Female %	Female Dummy	CEO Female	Board Size	Board Age	CEO Age	Tenure	Firm Age	Leverage	Firm Size	Family-owned
ROA	1.0000												
Bankruptcy	0.0271	1.0000											
Female %	0.0061	0.0124	1.0000										
Female D.	0.0061	0.0039	0.8530	1.0000									
CEO Fem.	0.0170	0.0097	0.5976	0.4672	1.0000								
Board Size	0.0256	0.0182	0.0674	0.3119	0.0072	1.0000							
Board Age	0.0256	0.0170	0.0483	-0.0282	0.0408	0.0365	1.0000						
CEO Age	0.0167	0.0193	0.0056	0.0100	0.0996	0.0455	0.6830	1.0000					
Tenure	0.0239	0.0013	0.0142	-0.0145	0.0706	0.1177	0.3522	0.4255	1.0000				
Firm Age	0.0716	0.0074	0.0079	0.0570	0.0315	0.0872	0.3112	0.2819	0.4738	1.0000			
Leverage	0.0486	0.0060	0.0005	-0.0017	0.0001	0.0043	0.0028	0.0035	0.0010	0.0013	1.0000		
Firm Size	0.2473	0.0688	0.0954	0.0054	0.1118	0.3317	0.0714	0.0327	0.0737	0.2112	0.0494	1.0000	
Family-owned	0.0306	0.0155	0.0381	-0.0138	0.0212	0.2515	0.0416	0.0061	0.0469	0.0288	0.0016	0.1262	1.0000

4 Methodology

In this section, we will look at the models and the regression framework that is used in this paper. To test the hypotheses, we will perform two-tailed t-tests. The panel data includes observations of multiple variables over multiple periods for the same firms, which allows us to eliminate unobservable heterogeneity that may occur among companies in the sample (Himmelberg, Hubbard & Palia, 1999).

To test our first hypotheses, whether firms with greater board diversity perform better financially than those with lower board diversity, we start with a pooled OLS regression:

$$ROA_{i,t} = \beta_0 + \beta_1 Diversity_i + \beta_2 X_{i,t} + \beta_3 Year_t + u_i + \epsilon_{i,t} \tag{4.1}$$

where:

$ROA_{i,t}$	ROA is Return of Assets of firm i, in year t.
$Diversity_i$	Female %, as a percentage of females in the board and Female Dummy, taking the value of 1 if there is female presence on the board.
$X_{i,t}$	Vector of firm specific control variables (*Firm Size*, *Firm Age, Leverage*) and board specific control variables (*Board Size, Board Age*, *Tenure* and *Family-owned*).
$Year_t$	Vector of year dummies, called time fixed effects.
u_i	Unobserved fixed effects.
$\epsilon_{i,t}$	Serially uncorrelated measurement error.

The simplest way to deal with panel data would be to estimate a pooled regression. The pooled regression has limitations and assumes one observation of a firm in year one will be independent of an observation of the same firm in year two[10]. In financial research, there are two classes of panel data estimators commonly used: fixed effects and random effects (Brooks, 2008, pp. 488-490). These two estimations are used to reduce the endogeneity problem[11] by controlling for the

[10] Additionally, the OLS estimator is required to fulfill the following conditions: 1) the linear regression is linear in parameters, 2) the sample of observations is random, 3) the conditional mean is zero, 4) the error term is not correlated with the independent variables, exogenous variables, 5) one independent variable cannot be a perfect linear combination of the other independent variables (no perfect multicollinearity), 6) the error terms is homoscedastic and not correlated with each other, and 7) the error terms are normally distributed (Stenheim, 2018).

[11] Endogeneity problem is when the independent variables correlate with the error term.

unobserved effects[12] and time-constant factors that affect the dependent variable (Wooldridge, 2016, p. 412). We will estimate equation 4.1 by using the random effect model. The reasons for choosing this as the primary model will be provided in the following paragraphs.

Parsons and Titman (2007) and Roberts and Whited (2012) argues that one of the main issues in empirical corporate finance is endogeneity. The three sources to endogeneity are; 1) the independent variables are not strictly exogenous, 2) omitted variables causing a biased result and 3) the independent variable is a function of the dependent variable (opposed to being a cause of the dependent variable, also called reverse causality) (Dandrove, 2012). First, we assume that our accounting variables are likely to be endogenous, causing the coefficients to be biased (López, 2014; Hermalin & Weisbach, 2001). For example, ROA in one year is depending on the total assets in the year before, and therefore, the independent variables are believed not to be strictly exogenous. Second, omitted variable bias happens when relevant variables are excluded (Wooldridge, 2016, p. 78). An example is corporate culture. It is difficult to quantify but could very likely be a factor in the financial performance of a firm. Therefore, unquantified variables are often excluded in regression models, and consequently, such exclusion could cause a biased and inconsistent result. Third, reverse causality might also be a problem (Adams & Ferreira, 2009). For example, the number of female directors may affect financial performance, but financially successful firms may also attract more female directors. Therefore, with the random effects model, we will do several steps to control and reduce the risk of endogeneity in this research.

Firstly, a variety of control variables is chosen[13], which we believe will work as proxies for the omitted exogenous parameters in the model (Coles, Lemmon & Meschke, 2012). In addition, we correct for heteroscedasticity by clustering the standard errors at company level, as well as using time-fixed effects. The last step in confronting the endogeneity issue, and especially the reverse causality problem, is to lag the explanatory variables by one year and treat as endogenous (Garay & Gonzales, 2008; Frank & Goyal, 2009; Arellano & Bond, 1991). The lagging is

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[12]Also called unobservable heterogeneity.
[13] Explained thoroughly in chapter 3.4.2.

done because change does not happen overnight, and it likely takes some time before actions from the board materialize. Therefore, before concluding, it is necessary to see if the results still hold when lagging one year backward.

Furthermore, we chose the random effect model because it is stricter than the fixed effects model. There are two main advantages of using the random versus the fixed effects model: First, the random effect model allows time-invariant variables, such as gender or industry in the model. Fixed effects model on company level, will remove any explanatory variable that is constant over time, and thus, we cannot include variables as gender in such a model (Wooldridge, 2016, p. 436). Second, there are fewer parameters to be estimated in the random effects versus the fixed effects model because there are no industry dummies to capture the heterogeneity variation in the cross-sectional dimensions, and therefore the model should produce more efficient estimations than the fixed effects model (Brooks, 2008, p. 500). However, the random model is only valid when the composite error term is uncorrelated with all explanatory variables. We, therefore, use GLS[14] to adjust for the resulting heterogeneity in randomness across groups (Wooldridge, 2016). For robustness, we will however also estimate a fixed effect model at industry level, which allows time-invariant variables (in contrast to the ordinary fixed effect model at company level). The model then includes a dummy variable for every industry except one to avoid perfect collinearity (Wooldridge, 2016, p. 438). This allows us to compare a firm's performance to another within the same industry.

We also include time fixed effects with time dummies in the model. The time fixed effects will control for the variables that effect ROA and vary over time, but are constant across companies (Brooks, 2008, p. 493). Our sample contains data through 17 years, and there are obviously fluctuations in the economy. The only difference from the industry fixed effect model is that we include dummies for each year except one, which will capture time variation, rather than cross-sectional variation (Brooks, 2008, p. 493). After estimating both the industry fixed effect and

[14] GLS is Generalized Least Square. The GLS is used when there is a certain degree of correlation between the residuals in the model, where OLS will be inefficient. The main assumptions of the GLS-estimator are: 1) the expected error terms are zero and there is zero correlation between both types of error terms, 2) the explanatory variables are serially uncorrelated and 3) the error terms are homoscedastic, (López, 2014, p. 18; Wooldridge, 2016, p. 438).

random model, we test if the time-dummy coefficients for all years are jointly equal to zero. The test shows that the dummies are significant, and we include time dummies for all models. By applying time dummies and clustering the standard errors on firm level, as well as lagging the explanatory variables, it is more likely that the strict conditions for the random effect model holds, and the GLS estimator is consistent and efficient.

Lastly, we need to adjust the standard errors of panel data estimators since each additional time period of data is independent of previous periods. In panel data, standard errors are likely to be correlated, and in our case, ROA for a specific company is likely to be correlated over time. In accordance with conventional methods, we will cluster the standard errors over time on a company level and adjust for potential heteroscedasticity (Cameron & Trivedi, 2010, p. 244).

After performing the tests linked to our first hypothesis, we go on to test our second. To find out if firms with female presence lead to a lower probability of bankruptcy, we use the following binary logit regression model:

$$p(Bankruptcy_{i,t} = 1) = F(\beta_0 + \beta_1 DFemale_i + \beta_2 X_{i,t} + \beta_3 Year_t + \mu_i + \epsilon_{i,t}) \qquad (4.2)$$

where:

$Bankruptcy_{i,t}$	=1 if firm i is forcibly dissolved in year t, =0 otherwise.
$DFemale_i$	Female Dummy, =1 if there is female presence on the board, =0 otherwise.
$X_{i,t}$	Vector of firm specific control variables (*Firm Size*, *Firm Age, Leverage*) and board specific control variables (*Board Size, Board Age, Tenure* and *Family-owned*).
$Year_i$	Vector of year dummies, called time fixed effects.
μ_i	Unobserved fixed effects.
$\epsilon_{i,t}$	Serially uncorrelated measurement error.

The Logit model has several assumptions, but the OLS and GLS model is stricter and has more assumptions than the Logit model. When the conditions hold for the OLS and GLS as already discussed, we can assume that all the conditions for Logit hold as well. This is because we use the same variables and estimations. With the same argument as for the first hypothesis, we will apply industry fixed effects, time fixed effects, and clustering the standard errors on company level for the logit model as well.

5 Empirical Results

5.1 Main results hypothesis 1

Hypotheses 1: Norwegian AS-firms with greater board gender diversity perform better than those with low board gender diversity.

Table 5.1: The effect on Return on Assets

This table shows the result of regressing ROA on gender diversity measures and a set of company and board specific variables. The sample consist of AS-firms in the period 2000-2017. ROA is return on assets, measured as net income divided by the average of total assets. Female % is the percentage of female board members relative to the total number on the board. Female Dummy is equal to 1 if female board members are present, zero otherwise. Firm Size is measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Column (1) and (3) are estimated with pooled OLS with industry fixed effects and clustered robust standard errors at firm level. Column (2) and (4) use the random effect model with clustered robust standard errors at firm level. The first two columns use Female % as diversity measure, while the last two are with Female Dummy. All models are interacted with a year dummy. Clustered robust standard errors in parentheses.

	(1) Pooled OLS	(2) Random Effect	(3) Pooled OLS	(4) Random Effect
Female %	0.0297***	0.0339***		
	(0.0017)	(0.0017)		
Female Dummy			0.0192***	0.0211***
			(0.0010)	(0.0010)
Firm Size	0.0822***	0.0819***	0.0821***	0.0818***
	(0.0006)	(0.0005)	(0.0005)	(0.0005)
Firm Age	-0.0011***	-0.0012***	-0.0011***	-0.0012***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Leverage	-0.0000**	-0.0000**	-0.0000**	-0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Board Size	-0.0275***	-0.0276***	-0.0290***	-0.0293***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Board Age	-0.0003***	-0.0002***	-0.0003***	-0.0003***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Tenure	0.0012***	0.0011***	0.0012***	0.0011***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Family-owned	0.0172***	0.0172***	0.0171***	0.0171***
	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Constant	-1.1400***	-1.1107***	-1.1363***	-1.1059***
	(0.0091)	(0.0080)	(0.0091)	(0.0080)
Industry FE	Yes	No	Yes	No
Time FE	Yes	Yes	Yes	Yes
R-Squared	0.0893	0.0849	0.0893	0.0849
No. of observations	1,635,287	1,639,623	1,635,287	1,639,623
No. of firms	188,412	188,635	188,412	188,635

*** p<0.01, ** p<0.05, * p<0.1

Table 5.1 shows the initial results of regressing ROA with the diversity variables and the control variables, on Norwegian AS-firms. Column (1) and (3) are estimated by pooled OLS. In the pooled OLS, industry fixed effects have been applied. Female Percentage is the primary explanatory variable in the first two columns, while the indicator variable for female presence is used in the last two. All models use time-fixed effects. The results do not change significantly according to the estimation method. Unless stated, the results hereon only use the random effect model.

Both gender diversity measures show a positive effect on ROA. The coefficient for Female Percentage is 0.0339 and 0.0211 for the Female Dummy, and both are significant at the 1% level. When the rate of females increased by 1%, then ROA increases by ~0.034% with 99% certainty. Similar, by having one or more females present on the board, ROA increases by ~0.021% with 99% certainty. Additionally, Firm Size has a significantly high positive coefficient of 0.0819, indicating that when the firms are larger, ROA is also larger. Firm Age, on the other hand, has a statistically significant low negative impact of 0.0012. In addition, Board Size and Board Age is statistically significant with negative coefficients. This result implies that when the board is larger and older, ROA decreases. If the board increases by one person, ROA decreases with ~0.03%. Similarly, if the mean age of the board, Board Age, increases by one year, ROA decreases marginally with 0.0002 and 0.0003. Additionally, Tenure is also positively statistically significant with a coefficient of 0.0011, meaning one more year of CEO tenure increases ROA by ~0.001. Family ownership is also positively significant, with a coefficient of 0.0172. All control variables are statistically significant at the 1% level, except Leverage which is significant at the 5% level.

Furthermore, our results show that when including both AS and ASA-firms together, the results stay the same. However, when only analyzing ASA-firms, the results show that there is no link. This is in accordance to previous research on ASA, showing that the GBL did not give firms an enhanced financial performance. The results are found in Table 8.3 and 8.4 in the Appendix.

The initial model proves our first hypotheses. AS-firms with greater board gender diversity do perform better financially than those with lower board gender diversity. In addition, the results prove that the forced increase in gender diversity by law on ASA-firms decreases the shareholders' value compared to the natural increase of females in AS-firms.

5.1.1 Robustness tests

Even though the initial results proved our hypotheses, we challenged the results with a series of robustness tests before concluding. Steps taken were 1) lagging variables one year, 2) splitting the sample into two periods, and 3) reducing the explanatory variables in the sample.

As mentioned, reverse causality is an issue regarding the research. The initial model indicates that increased board gender diversity increases a firm's financial performance. However, since it could be that better performing firms attract more females, we check with lagged variables in order to minimize the endogeneity problem. Table 5.2 compares the results from our initial model (first column) with a lagged model (second column). We only show results from the percentage of females, but the same has been done to the other diversity variable, which can be found in Table 8.5 in Appendix. Whether we use the dummy or percentage, the results are still positively significant. However, the result is only significant at a 5% level for female percentage and the coefficient changes from 0.0339 to 0.0042. For the female dummy, the result is still significant at the 1% level, but the coefficient changes from 0.0211 to 0.0067 with lagged variables. This means that even with the variables lagged one year back, gender diversity still has a positive effect on the financial performance the year after.

We find a small difference in the other explanatory variables as well, but Leverage changes from being significant at the 5% level to be insignificant. The coefficients that change the most are Firm Size (from 0.0819 to 0.0244) and Board Size (from -0.0276 to -0.0121). The change in the coefficient is still quite low, which we will not investigate further. R-squared is highest in the original model, with 0.0849. In all models, the constants are negative, but this is not of concern. It means that if all the explanatory variables are set to zero, ROA will be negative, which makes sense. Furthermore, these results strengthen our main findings; that increased female presence on the board has a positive impact on a firm's financial performance.

Table 5.2: The effect in ROA with and without lagged variables and in two time periods
The table shows the result of regressing ROA with and without lagged explanatory variables by 1 year. The regression is performed on AS-firms in two periods, 2000-2017 and 2005-2017. ROA is return on assets, measured as net income divided by the average of total assets. Female % is percentage of female board members relative to total number on the board. Firm Size is measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is mean age of all board members. Tenure is number years the current CEO has had the position. Family-owned equals 1 if ultimate ownership is >90% of same family, zero otherwise. Column (1) and (2) show results from 2000-2017, where column (2) are with lagged variables (except Firm Age). Column (3) and (4) shows results from 2005-2017, where column (4) are with lagged variables (except Firm Age). Clustered robust standard errors in parentheses.

	(1) RE 2000-2017	(2) RE lagged 2000-2017	(3) RE 2005-2017	(4) RE lagged 2005-2017
Female %	0.0339***	0.0042**	0.0335***	0.0003**
	(0.0017)	(0.0018)	(0.0018)	(0.0019)
Firm Size	0.0819***	0.0244***	0.0831***	0.0245***
	(0.0005)	(0.0006)	(0.0006)	(0.0006)
Firm Age	-0.0012***	0.0007***	-0.0012***	0.0006***
	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Leverage	-0.0000**	-0.0000	-0.0000**	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Board Size	-0.0276***	-0.0121***	-0.0290***	-0.0112***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Board Age	-0.0002***	-0.0002***	-0.0004***	-0.0003***
	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Tenure	0.0011***	0.0004***	0.0015***	0.0009***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Family-owned	0.0172***	0.0147***	0.0158***	0.0130***
	(0.0008)	(0.0009)	(0.0009)	(0.0010)
Constant	-1.1107***	-0.3335***	-1.0882***	-0.2966***
	(0.0080)	(0.0082)	(0.0086)	(0.0091)
Industry FE	No	No	No	No
Time FE	Yes	Yes	Yes	Yes
R-squared	0.0849	0.0384	0.0880	0.0405
No. of observations	1,639,623	1,627,572	1,330,220	1,236,034
No. of firms	188,635	188,179	174,179	169,208

*** p<0.01, ** p<0.05, * p<0.1

The model is further challenged by splitting the sample into two periods. The full sample from 2000 to 2017, and a reduced sample from 2005 to 2017. As discussed, there was an extensive taxation reform in 2005, changing the behavior of the firms around that time. In columns three and four in the table above, we run the same tests of the initial model and the lagged model for the reduced period from 2005-2017. Again, increased female presence is statistically positively significant. The Female

Percentage remains positive significant at the 5% level and the Female Dummy remains positive significant at the 1% level, in the reduced time sample. Every other variable remains significant at the same level. There is little difference in the value of the coefficients as well; the coefficient for percentage of females for the years 2000-2017 is 0.0339, while it in the period 2005-2017 is 0.0335. These results argue that the new taxation form had no significant effect on our sample.

Lastly, we study the effects and consistency of the coefficients by reducing our model with one variable per regression. The results are shown in Table 5.3. We find that the female percentage remains positively significant at the 1% level until the number of control variables becomes less than four with no significance. This is not of surprise and is likely because essential control variables, such as Board Size and Firm Size, are excluded. R-squared decreases with the number of variables reduced, bit is reduced the most when board and firm size are removed. This, therefore, support that there might exist an omitted variable bias because board and firm size are important drivers for financial performance. The overall findings are that the coefficients are steady during the reduction of variables, and the original model is appropriate. The same results are found when reducing variables in the model without lagging variables and using the female indicator variable. These results can be found in Table 8.6, 8.7, and 8.8 in the Appendix.

The findings show that the model is stable and consistent, which strengthens the liability to our model. To conclude on the first hypothesis, we believe there is no problem with causality or endogeneity in the analysis considering the steps made[15]. The results remain the same throughout the analysis: An increase in the percentage of female is positively increasing the financial performance in Norwegian AS-firms. Based on these results, we go on to check if this still holds when looking at firms that have gone bankrupt, and question if firms with female board members are less or more likely to be dissolved.

[15] Steps done to reduce the chance of endogeneity in the model: 1) Chosen a variety of control variables to work as proxies omitted exogenous parameters in the model, 2) use of random effect model, 3) use of time dummies, 4) clustering the standard error by company level, 5) lagging explanatory variables with one year, 6) controlling for a new time period; 2005-2017 due to new reform of taxation of dividends, 7) checking the model consistency by reducing one and one variable

Table 5.3: The effect on ROA by reducing lagged variables: RE and Female %

This table shows the results of regressing ROA on lagged Female % and a set of lagged explanatory control variables by 1 year. The sample consist of AS-firms in the period 2000-2017. Per regression, one variable is dropped. ROA is return on assets, measured as net income divided by the average of total assets. L.Female % is the lagged percentage of female board members relative to the total number on the board. L.Firm Size is the lagged size of firm measured as the natural logarithm of total assets. Firm Age is the amount of year since the firm's foundation. L.Leverage is the lagged debt level, measured as the total debt to total assets. L.Board Size is the lagged number of board members. L. Board Age is the lagged mean age of all board members. L.Tenure is the lagged amount of years the current CEO has had the position. L.Family-owned is equal to 1 if ultimate ownership is >90% of same family a year before, zero otherwise All regressions are performed with the random effect model, and all variables are interacted with time dummies. Clustered robust standard errors in parentheses.

L.Female %	0.0042**	0.0050***	0.0055***	0.0058***	0.0004	0.0004	0.0004	-0.0074***
	(0.0018)	(0.0018)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0018)
L.Firm Size	0.0244***	0.0242***	0.0239***	0.0239***	0.0221***	0.0223***	0.0228***	
	(0.0006)	(0.0006)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	
FirmAge	0.0007***	0.0007***	0.0008***	0.0008***	0.0008***	0.0008***		
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		
L.Leverage	-0.0000	-0.0000	-0.0000**	-0.0000**	-0.0000**			
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)			
L.Board Size	-0.0121***	-0.0128***	-0.0126***	-0.0125***				
	(0.0004)	(0.0004)	(0.0004)	(0.0004)				
L.Board Age	-0.0002***	-0.0002***	-0.0001***					
	(0.0001)	(0.0001)	(0.0000)					
L.Tenure	0.0004***	0.0004***						
	(0.0001)	(0.0001)						
L.Family-owned	0.0147***							
	(0.0009)							
Constant	-0.3335***	-0.3165***	-0.3165***	-0.3225***	-0.3246***	-0.3268***	-0.3323***	-0.0148***
	(0.0082)	(0.0081)	(0.0075)	(0.0074)	(0.0074)	(0.0075)	(0.0073)	(0.0012)
Industry FE	No	No	No	No	No	No	No	No
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0384	0.0372	0.0375	0.0375	0.0313	0.0309	0.0317	0.0010
Number of observations	1,627,572	1,627,572	1,829,684	1,829,684	1,829,684	1,829,684	1,829,882	1,832,336
Number of companies	188,179	188,179	222,103	222,103	222,103	222,103	222,103	222,165

*** p<0.01, ** p<0.05, * p<0.1

5.2 Main results hypothesis 2

Hypotheses 2: Firms with one or more females on the board are less likely to go bankrupt than firms without females on the board.

Table 5.4: Initial results from logit regression model

The table shows a logit regression of bankruptcy on female presence and a number of control variables. The analysis is based on a random 50% sample of AS-firms in the period 2005-2017. Bankruptcy equals 1 if the firm went bankrupt in that year, and zero otherwise. Female Dummy is equal to 1 if there are one or more females on the board, and zero otherwise. ROA is return on assets, measured as net income divided by the average of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Firm Size will be controlled for later. Clustered robust standard errors in parentheses.

	Coefficients	Odds	%
Female Dummy	0.2426***	1.2746	27.46%
	(0.0187)		
ROA	-0.9198***	0.3986	-60.14%
	(0.0170)		
Firm Age	-0.0243***	0.9760	-2.40%
	(0.0012)		
Leverage	0.0000*	1.0000	0.00%
	(0.0000)		
Board Size	-0.1936***	0.8240	-17.60%
	(0.0078)		
Board Age	0.0194***	1.0196	1.96%
	(0.0009)		
Tenure	0.0065***	1.0065	0.65%
	(0.0020)		
Family-owned	1.5943***	4.9249	392.49%
	(0.0413)		
Constant	-5.8200***		
	(0.0987)		
Industry FE	Yes		
Time FE	Yes		
Pseudo R2	0.0569		
No. of observations	649,891		
Predictive margins Female Dummy	Margin	z	P>|z|
0 = Male	0.0228	105.03	0.0000
	(0.0000)		
1 = Female	0.0291	68.50	0.0000
	(0.0000)		

*** p<0.01, ** p<0.05, * p<0.1

Table 5.4 shows that the overall model finds that companies going bankrupt have higher odds[16] of having a board with one or more females (Female Dummy). The interpretation of the odds is that companies going bankrupt have 27% higher odds of having one or more females on the board with a 99% certainty. The predicted probability for the same variable is found at the end of the same table. This shows that the predicted probabilities of companies going bankrupt are 2.9% for boards with one or more females and 2.3% for boards with only men in the sample. These results are the opposite of what we anticipated. Since female presence increased the financial performance in our first hypothesis, we should expect that female presence also would decrease the probability of bankruptcy. This is further underlined in the model by testing ROA. When ROA goes up, the odds for going bankrupt decreases with a 99% certainty. Therefore, we should expect that female presence, which was shown to significantly improve ROA of a company in the first hypothesis, also should decrease the chance of bankruptcy. However, the first results show that having one or more females on the board actually increases the odds of going bankrupt. These results, therefore, need to be tested more thoroughly in order to confirm our first results, which we will go through in the next chapter.

The initial model also shows that board size matters in companies going bankrupt. The predicted probabilities of each Board Size are found in Table 5.5. This shows that the companies going bankrupt have a predicted probability of 3% on having only one on the board, 2.6% of having two, 2.1% of having three and so on. We therefore see that the larger the Board Size, the less the predicted probability of going bankrupt is, with a 99% certainty. However, for the largest board in our sample, we see that the p-value increases, meaning that it is less significant. For boards of eight or nine people the p-value is only significant at a 5% level, while for a board with ten members, the results are only significant at the 10% level. This is also shown in the margins plot in Figure 5.6, which reflects the uncertainty of larger boards, but shows that smaller boards have a higher (and more certain) probability of being bankrupt.

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[16] Odds are defined as $\frac{p_i}{1-p_i}$ where p_i is the probability of event i occurring. It compares the probability of the occurrence with the probability of nonoccurrence of the event.

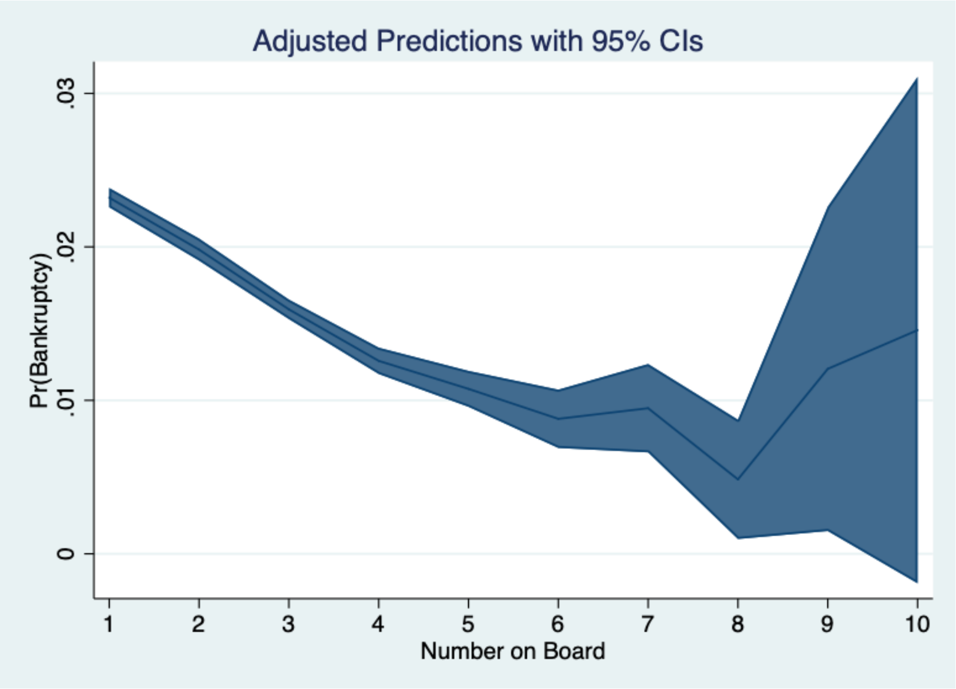
Table 5.5: Predicted probabilities of board size on bankruptcy

The figure shows the results of predicted margins for each level of Board Size. The predicted probabilities calculate the marginal effects of each variable. The margins range between -1 and 1. Margins equal 1, means that the size of board predict bankruptcy correct 100% of the times. Margins equal -1, means that the size of board predict bankruptcy incorrect 100% of the times. Board Size is the number of people on the board, ranging from 1-10 people.

Board Size	Margin	Std. Error	z-value	p-value
1	0.0298	0.0003	89.65	0.0000
2	0.0255	0.0004	59.59	0.0000
3	0.0206	0.0004	52.00	0.0000
4	0.0163	0.0006	29.38	0.0000
5	0.0140	0.0008	18.25	0.0000
6	0.0140	0.0012	9.17	0.0000
7	0.0124	0.0019	6.53	0.0000
8	0.0063	0.0026	2.46	0.0140
9	0.0156	0.0069	2.26	0.0240
10	0.0189	0.0107	1.76	0.0790

Figure 5.1: Predicted probabilities with 95% confidence interval

The figure shows the results of predicted margins for each level of Board Size with a 95% confidence interval. The predicted probabilities calculate the marginal effects of each variable. The margins range between -1 and 1. Margins equal 1, means that the size of board predict bankruptcy correct 100% of the times. Margins equal -1, means that the size of board predict bankruptcy incorrect 100% of the times. Board Size is the number of people on the board, ranging from 1-10 people.



The other explanatory variables also seem to be statistically significant. The results show that companies going bankrupt are more likely to have an older board, a CEO that has been employed longer and is a family-owned company. Leverage does not seem to have a sizable impact on the result but has a small positive coefficient (not seen in the table due to only four digits) with a 99% certainty. Higher ROA and higher age of the company gives less odds of being bankrupt with 99% certainty, which is as expected.

5.2.1 Robustness tests

The second hypothesis proved to be wrong with the initial results. If the first results hold, companies going bankrupt are more likely to have females on their boards. Based on previous research, we anticipated that it would have been the other way around. Therefore, we question the result of the initial model and need to exam further to conclude. We will lag the explanatory variables by one period, control what happens when only looking at certain subsamples and check if the results still hold if we only look at firms that go from having zero females on the board to having females on the board.

Results from lagging the variables one and two periods back are shown in Table 5.6. Bankruptcies are not likely to happen overnight and are often a result of a “downward spiral” (Hambrick & D’Aveni, 1988). Therefore, looking at the variables one year in advance might give a different result than only in the year of the bankruptcy. The results show that female presence on the board have an even higher odds, and the margins tell us that companies going bankrupt have a predicted probability of 3.1% on having females on the board, compared to 2.9% in the initial model. However, the predicted probability for bankrupt companies in being only male also increased to 2.4%, compared to 2.3% in the initial model. The results therefore do not differ substantially from the initial model. Additionally, most other explanatory variables are still statistically significant with 99% certainty, except for Tenure and Leverage, which are not significant anymore. All of the significant variables have the same effect on bankruptcy as in the initial model. Additionally, to control, we also lagged the variables two periods back to see if it affected the results. As shown in the table above, this gives roughly the same results as in the two previous models. From this, we conclude that even when lagging the variables, bankrupt companies are still more likely to have females on the board than only males.

Table 5.6: Logit regression with lagged explanatory variables

The table shows a logit regression of bankruptcy on lagged female presence and a number of lagged control variables by 1 year. L.ROA is lagged return on assets, measured as net income divided by the average of total assets. The analysis is based on a random 50% sample of AS-firms in the time period 2005-2017. L.Female % is the lagged percentage of female board members relative to the total number on the board. Firm Age is the amount of year since the firm's foundation. L.Leverage is the lagged debt level, measured as the total debt to total assets. L.Board Size is the lagged number of board members. L. Board Age is the lagged mean age of all board members. L.Tenure is the lagged amount of years the current CEO has had the position. L.Family-owned is equal to 1 if ultimate ownership is >90% of same family a year before, zero otherwise. Column (1) shows results with variables lagged one year (except Firm Age). Column (2) shows results with variables lagged two years (except Firm Age). Both models are interacted with industry and time dummies. Clustered robust standard errors in parentheses.

	Lagged (n-1)			Lagged (n-2)		
	Coefficients	Odds	%	Coefficients	Odds	%
L.Female Dummy	0.2654***	1.3040	30.40%	0.2899***	1.3363	33.63%
	(0.0196)			(0.0214)		
L.ROA	-0.7537***	0.4706	-52.94%	-0.6122***	0.5422	-45.78%
	(0.0199)			(0.0239)		
Firm Age	-0.0256***	0.9747	-2.53%	-0.0245***	0.9758	-2.42%
	(0.0013)			(0.0013)		
L.Leverage	0.0000	1.0000	0.00%	0.0005	1.0005	0.05%
	(0.0001)			(0.0005)		
L.Board Size	-0.2014***	0.8176	-18.24%	-0.2075***	0.8126	-18.74%
	(0.0080)			(0.0087)		
L.Board Age	0.0196***	1.0198	1.98%	0.0217***	1.0219	2.19%
	(0.0010)			(0.0010)		
L.Tenure	0.0021	1.0021	0.21%	0.0014	1.0014	0.14%
	(0.0021)			(0.0023)		
L.Family-owned	0.3737***	1.4531	45.31%	0.1499***	1.1617	16.17%
	(0.0272)			(0.0270)		
Constant	-4.4043***			-4.1503***		
	(0.0962)			(0.1025)		
Industry FE	Yes			Yes		
Time FE	Yes			Yes		
Pseudo R2	0.0352			0.0306		
No. of observations	563,455			484,887		
Predictive margins Female Dummy	Margin	z	P>|z|	Margin	z	P>|z|
0 = Male	0.0238	98.40	0.0000	0.0229	89.91	0.0000
	(0.0020)			(0.0000)		
1 = Female	0.0307	64.97	0.0000	0.0303	60.11	0.0000
	(0.0051)			(0.0000)		

*** p<0.01, ** p<0.05, * p<0.1

Further, the size of the companies might impact the results. Therefore, running the regression for different sizes of firms could potentially show if the results apply to all types of companies or just some sizes. We first test this by using the size of the total assets of the companies, splitting total assets into four quartiles. Companies with the smallest 25% (first quartile) of total assets are denoted as "micro firms", the second quartile as "small firms", third quartile as "medium firms" and the last quartile as "large firms". The full results are found in Table 8.9 in Appendix, while the odds ratios and margins are found in Table 5.7.

Table 5.7: Logit regression by size of company measured by assets

The table shows a logit regression of bankruptcy on female presence and a number of control variables, by firm size. The analysis is based on a random 50% sample of AS-firms in the time period 2005-2017. The sample is split in four quartiles by assets, as a measure of firm size: micro firms (first quartile), small firms (second quartile), medium firms (third quartile) and large firms (fourth quartile). Bankruptcy equals 1 if the firm went bankrupt in that year, and zero otherwise. Female Dummy is equal to 1 if there are one or more females on the board, and zero otherwise. Firm Age is the amount of years since the firm's foundation. Leverage is the debt level, measured as the total debt to total assets. ROA is return on assets, measured as net income divided by the average of total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Clustered robust standard errors in parentheses.

	Micro Firms Odds	Small Firms Odds	Medium Firms Odds	Large Firms Odds
Female Dummy	1.0674***	1.0251	1.1610**	1.3182***
ROA	0.7259***	0.7258***	0.7378**	1.4636
Firm Age	0.9863***	0.9942***	0.9913***	0.9906**
Leverage	1.0001	0.6758***	0.3624***	0.2404***
Board Size	0.9725***	0.9698*	0.9128***	0.8653***
Board Age	1.0109***	1.0275***	1.0284***	1.0106**
Tenure	1.0181***	1.0130***	1.0050	0.9641***
Family-owned	5.888***	3.9005	3.7401***	6.6862***
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Pseudo R-Squared	0.0195	0.0167	0.0175	0.0313
No. of observations	143,962	163,400	169,508	171,113
Predictive margins Female Dummy	Margin	Margin	Margin	Margin
0 = Male	0.0735	0.0212	0.0084	0.0028
1 = Female	0.0780	0.0217	0.0097	0.0037

*** p<0.01, ** p<0.05, * p<0.1

The results in Table 5.7 show that medium and large firms have the highest odds of females. However, the predicted margins of females are highest in micro and small firms. The results read as the following; Medium and large firms measured by the size of their assets have a higher odd (16.1% and 31.8%) of having females on their boards if going bankrupt. Micro firms also have higher odds of having a female on the board if going bankrupt (6.1%), but the odds are less than in the (50%) largest firms. The predicted margins, however, tell us that micro companies with females on the board have a predicted probability of 7.8% of being a bankrupt firm, compared to companies with only males with a predicted probability of 7.3%. For medium and larger companies, the predicted probability of bankruptcy is 0.10% and 0.4% if they have a female on the boards. Therefore, we can conclude that micro firms (the 25% smallest firms in our sample) have a higher chance of being bankrupt, if they have females in their boards, than medium and large firms. The results do not hold for small firms, which is not significant at all. Micro and large firms are significant with a 99% certainty, and medium firms with 95% certainty.

We further test this by dividing revenue into four quartiles using the same method as total assets. “Micro firms” then become the 25% lowest firms measured by total revenue, “small firms” the next 25% of the firms measured by total revenue and so on. We therefore split the companies in terms of how large their turnover in sales is. These results give similar outcomes as when dividing companies into the size of assets but are statistically significant with a 99% certainty for small firms as well. To conclude from this, smaller firms have a higher predicted probability of going bankrupt if they have females present on their board, compared to being only male. For micro firms with females, the predicted probability is 6.2% (against 4.9% for only male), and for small firms, the predicted probability is 4.1% (against 3.5% for only males). In comparison, the 25% largest firms in the sample, only have 0.6% predicted probability of going bankrupt if there are females present (against 0.5% for males). The results are not presented here but can be found in Table 8.10 in Appendix.

We also checked if there is any difference when it comes to ownership, and if this might drive the results of the surprising result. Most companies that were dissolved only had one owner[17]. Therefore, the logit model was tested on companies with only one owner, where the results are shown in Table 5.8. The results show that the number of owners does not particularly matter. The logit regression remains very similar both when looking at single-owned companies and companies with multiple

[17] See Table 8.11 in Appendix.

owners. However, in terms of predicted probabilities, the companies with only one owner are more likely to be a bankrupt company than those with multiple owners.

Table 5.8: Logit regression by one or multiple owners

The table shows a logit regression of bankruptcy on female presence and a number of control variables, by one or multiple owners. The analysis is based on a random 50% sample of AS-firms in the time period 2005-2017. Bankruptcy equals 1 if the firm went bankrupt in that year, and zero otherwise. Female Dummy is equal to 1 if there are one or more females on the board, and zero otherwise. ROA is return on assets, measured as net income divided by the average of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Clustered robust standard errors in parentheses.

	Only one owner			More than one owner		
	Coefficients	Odds	%	Coefficients	Odds	%
Female Dummy	0.2270***	1.2548	25.48%	0.2263***	1.2540	25.40%
	(0.0204)			(0.0602)		
ROA	-0.9051***	0.4045	-59.55%	-0.8921***	0.4098	-59.02%
	(0.0185)			(0.0575)		
Firm Age	-0.0283***	0.9721	-2.79%	-0.0332***	0.9673	-3.27%
	(0.0013)			(0.0044)		
Leverage	0.0000	1.0001	0.01%	0.0005	1.0005	0.05%
	(0.0000)			(0.0010)		
Board Size	0.0777***	1.0808	8.08%	-0.2693***	0.7639	-23.61%
	(0.0078)			(0.0244)		
Board Age	0.0208***	1.0210	2.10%	0.0052*	1.0052	0.52%
	(0.0009)			(0.0032)		
Tenure	0.0140***	1.0141	1.41%	0.0196***	1.0198	1.98%
	(0.0021)			(0.0071)		
Family-owned	2.0026***	7.4083	640.83%	0.0412	1.0421	4.21%
	(0.2254)			(0.0584)		
Constant	-5.9839***			-7.1280***		
	(0.2439)			(0.3992)		
Industry FE	Yes			Yes		
Time FE	Yes			Yes		
Pseudo R2	0.0580			0.1227		
No. of observations	318,843			331,048		
Predictive Margins	Margin	z	P>|z|	Margin	z	P>|z|
0 = Male	0.0451	101.58	0.0000	0.0040	29.70	0.0000
	(0.0000)			(0.0000)		
1 = Female	0.0510	65.00	0.0000	0.0051	21.20	0.0000

*** p<0.01, ** p<0.05, * p<0.1

Furthermore, from the initial results in chapter 5.2, family-owned companies were more likely to be bankrupt than other firms. We therefore also wanted to check if this influenced the female variable. The results are shown in Table 5.9 below.

Table 5.9: Logit regression by family ownership or non-family ownership
The table shows a logit regression of bankruptcy on female presence and a number of control variables, by family or non-family ownership. The analysis is based on a random 50% sample of AS-firms in the time period 2005-2017. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Bankruptcy equals 1 if the firm went bankrupt in that year, and zero otherwise. Female Dummy is equal to 1 if there are one or more females on the board, and zero otherwise. ROA is return on assets, measured as net income divided by the average of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Clustered robust standard errors in parentheses.

	Not Family-owned			Family-owned		
	Coefficients	Odds	%	Coefficients	Odds	%
Female Dummy	0.3221***	1.3800	38.00%	0.2315***	1.2605	26.05%
	(0.0876)			(0.0192)		
ROA	-0.8593***	0.4192	-58.08%	-0.9298***	0.9112	-8.88%
	(0.0867)			(0.0174)		
Firm Age	-0.0334***	0.9672	-3.28%	-0.0238***	0.9765	-2.35%
	(0.0062)			(0.0012)		
Leverage	0.0170	1.0171	1.71%	0.0000*	1.0001	0.01%
	(0.0145)			(0.0000)		
Board Size	-0.2396***	0.7869	-21.31%	-0.1894***	0.8275	-17.25%
	(0.0335)			(0.0080)		
Board Age	0.0105**	1.0106	1.06%	0.0198***	1.0200	2.00%
	(0.0048)			(0.0009)		
Tenure	0.0261**	1.0264	2.64%	0.0051**	1.0051	0.51%
	(0.0103)			(0.0021)		
Constant	-7.3320***			-4.2177***		
	(0.6629)			(0.0905)		
Industry FE	Yes			Yes		
Time FE	Yes			Yes		
Pseudo R2	0.1242			0.0385		
No. of observations	117,963			531,928		
Predictive margins gender	Margin	z	P>|z|	Margin	z	P>|z|
0 = Male	0.0051	20.06	0.0000	0.0272	103.43	0.0000
	(0.000)			(0.000)		
1 = Female	0.0066	14.79	0.0000	0.0338	67.53	0.0000
	(0.000)			(0.000)		

*** p<0.01, ** p<0.05, * p<0.1

As shown in Table 5.9, the odds ratio of one or more females on the board is much larger in companies not-family-owned. In other words, if the company is not family-owned, the company is more likely to go bankrupt when there are females on the board versus all-male boards (with an odd at 1.38). However, the results also show that the predicted probability of going bankrupt is only 0.6% for firms not family-owned with females on the board. For family-owned firms however, the predicted probability is about 3.4%, which is much higher.

This reflects that family-owned firms are more likely to go bankrupt. Even though the odds for females being lower, the predicted margins still show that family-owned firms are more likely to go bankrupt if there is a female on the board than not. The predicted probability for family-owned companies with only males is around 2.7%. In family-owned companies, we also show that an increase in ROA decreases the probability of bankruptcy much less than in non-family-owned firms. For family-owned firms, the odds of bankruptcy go down by 8.9% when ROA increases. For non-family-owned firms, the odds of bankruptcy go down by 58% when ROA increases. An increase in ROA in non-family-owned firms therefore decreases the chance of bankruptcy more than in family-owned firms.

None of the adjustments tried above has given substantially different results than the initial model presented in chapter 5.2. It therefore seems that the hypothesis is proven to be wrong and that bankrupt firms more often have females on their boards than not. However, the model stated above does not test for how many females or the rate of females to males. It only indicates if the board has one female or more. The all-female boards are not removed either. Therefore, the results might be impacted by the all-female boards, since these are proven to more often go bankrupt (Figure 3.5). We therefore make one more adjustment and test the same logistic regression without the all-female boards.

The results are disclosed in Table 5.10. These results show that the odds of having a female present on the board when going bankrupt is lower than all-male boards. When excluding all-female boards, the odds of being a bankrupt firm is 15% lower if the board has at least one female on the board. The results when excluding all-female boards also show that the rest of the explanatory variables are similar as in the previous models, except Board Age. When not taking all-female boards into account, Board Age now gives a larger odd than before, signalizing that an increase in the age of the board increases the odds of bankruptcy with a 99% certainty. When it comes to the predictive margins, a firm with both genders only has a predicted probability of 2.0% in going bankrupt, while a firm with only males has a predicted probability of bankruptcy, which is 2.4%.

Table 5.10: Logit regression excluding boards with only females (zero males)
The table shows a logit regression of bankruptcy on female presence and a number of control variables, when excluding companies with all-female boards. The analysis is based on a random 50% sample of AS-firms in the time period 2005-2017. Bankruptcy equals 1 if the firm went bankrupt in that year, and zero otherwise. Female Dummy is equal to 1 if there are one or more females on the board, and zero otherwise. ROA is return on assets, measured as net income divided by the average of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Clustered robust standard errors in parentheses.

	Coefficients	Odds	%
Female Dummy	-0.1644***	0.8484	-15.16 %
	(0.0379)		
ROA	-0.8714***	0.4184	-58.16 %
	(0.0200)		
Firm Age	-0.0246***	0.9757	-2.43 %
	(0.0014)		
Leverage	0.0003	1.0003	0.03 %
	(0.0002)		
Board Size	-0.1845***	0.8315	-16.85 %
	(0.0097)		
Board Age	0.0194***	1.2141	21.41 %
	(0.0010)		
Tenure	0.0049**	1.0049	0.49 %
	(0.0023)		
Family-owned	1.7092***	5.5245	452.45 %
	(0.0496)		
Constant	-6.0342***		
	(0.1149)		
Industry FE	Yes		
Time FE	Yes		
Pseudo R2	0.0577		
No. of observations	508,456		
Predictive margins gender	Margin	z	P>|z|
0 = Male	0.0240	107.22	0.0000
	(0.0000)		
1 = Female	0.0205	28.49	0.0000
	(0.0000)		

*** p<0.01, ** p<0.05, * p<0.1

Additionally, we test if firms that go from only being male to have a female on the board support the results as well. We therefore exclude firms that have had females present on the board during the whole period and only include those that go from all-males to both genders (using all-male boards as a reference). The results show the same as in the previous model and are disclosed in Table 5.11.

Table 5.11: Logit regression by change from zero females to a female presence

The table shows the results from regressing bankruptcy, on companies with boards that goes from all-male to both genders during the period. The analysis is based on a random 50% sample of AS-firms in the time period 2005-2017. Bankruptcy takes the value 1 if a firm went bankrupt that year, and zero otherwise. Female Dummy is equal to 1 if there are one or more females present on the board, and zero otherwise. ROA is return on assets, measured as net income divided by the average of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Clustered robust standard errors in parentheses.

	Coefficients	Odds	%
Female Dummy	-0.0667*	0.9355	-6.45%
	(0.0376)		
ROA	-0.8645***	0.4213	-57.87%
	(0.0199)		
Firm Age	-0.0230***	0.9773	-2.27%
	(0.0014)		
Leverage	0.0001	1.0001	0.01%
	(0.0002)		
Board Size	-0.1997***	0.8190	-18.10%
	(0.0098)		
Board Age	0.0190***	1.0192	1.92%
	(0.0010)		
Tenure	0.0013	1.0013	0.13%
	(0.0023)		
Family-owned	1.6665***	5.2883	428.83%
	(0.0494)		
Constant	-5.7516***		
	(0.1122)		
Industry FE	Yes		
Time FE	Yes		
Pseudo R2	0.0559		
Observations	504,300		
Predictive margins gender	Margin	z	P>|z|
0 = Male	0.0239	106.91	0.0000
	(0.0000)		
1 = Female	0.0224	28.84	0.0000
	(0.0000)		

*** p<0.01, ** p<0.05, * p<0.1

Table 5.11 shows that when a female enters an all-male board, the overall odds of that firm going bankrupt are less than if it is an all-male board. The table shows that the odds of firms being bankrupt and have gone from zero females to having females on the board are 6.45% less than all male boards. In terms of predicted probability, the predicted probabilities of firms that have females entering their boards only have a 2.2% chance of going bankrupt. For all male boards, the predicted probability is 2.4%. This means that going from not being a gender diverse board, to increasing the gender diversity on the board decreases the predicted probability of going bankrupt with a 95% certainty.

Table 5.12: Logit regression with only all-male and all-female boards.

The table shows a logit regression of bankruptcy on companies with all-male or all-female boards (mixed boards excluded). The analysis is based on a random 50% sample of AS-firms in the time period 2005-2017. Bankruptcy equals 1 if the firm went bankrupt in that year, and zero otherwise. Female Dummy equals 1 if there are one or more females on the board, and zero otherwise. ROA is return on assets, measured as net income divided by the average of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is debt level, measured as total debt to total assets. Board Size is the number of board members. Board Age is mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned equals 1 if ultimate ownership is >90% of same family, zero otherwise. Clustered robust standard errors in parentheses.

	Coefficients	Odds	%
Female Dummy	0.2429***	1.2749	27.49%
	(0.0203)		
ROA	-0.9302***	2.5350	153.50%
	(0.0183)		
Firm Age	-0.0227***	0.9776	-2.24%
	(0.0013)		
Leverage	0.0001*	1.0001	0.00%
	(0.0000)		
Board Size	-0.1281***	0.8798	-12.02%
	(0.0083)		
Board Age	0.0222***	1.0224	2.24%
	(0.0009)		
Tenure	0.0038*	1.0038	0.38%
	(0.0022)		
Family-owned	1.5439***	4.6781	367.81%
	(0.0438)		
Constant	-5.9803***		
	(0.1057)		
Industry FE	Yes		
Time FE	Yes		
Pseudo R2	0.0524		
Observations	524,151		
Predictive margins gender	Margin	z	P>|z|
0 = Male	0.0259	101.59	0.0000
	(0.0000)		
1 = Female	0.0326	62.59	0.0000
	(0.0000)		

*** p<0.01, ** p<0.05, * p<0.1

We also tested all-female boards against all-male boards. These results are presented in Table 5.12 above and show that an all-female board has an odd of 27.5% of going bankrupt, compared to be an all-male board. In predictive margins, this means that an all-female board has a 3.2% chance of going bankrupt, while an all-male board has a 2.5% chance of going bankrupt.

To conclude the second hypothesis. Our initial model was based on a female variable, taking the value one if the board had one or more females on the board, and zero otherwise. That meant that our initial model took into account boards that were both all-female, and those who had both genders in the boards. These results clearly showed that female presence increased the odds of being a bankrupt firm. By excluding the all-female boards in the sample, we got a different result which, showed that a gender diverse board actually decreased the odds of being bankrupt. Thus, the conclusion is that all-female boards and all-male boards are more likely to go bankrupt than companies that have both gender present. Therefore, gender diversity leads to a lower chance of being a bankrupt firm. This means that our hypotheses are only half-way true. One female or more on the board may lessen the chance of bankruptcy, but having zero males on the board increases the chance. Therefore, a mix of genders prove the hypotheses correct, but too many females on the board prove the hypotheses to be wrong.

An additional note is that the results also show that family-owned firms are more likely to be bankrupt than non-family-owned firms. Board Size and the number of owners also seem to affect the probability of bankruptcy. The larger the board and the more owners, the less chance of going bankrupt.

6 Conclusion

This research set out to offer new insight into the relationship between board gender diversity and financial performance. In the aftermath of the GBL in Norway, there was a snowball of different studies related to board gender diversity to see if it had a significant effect on firm performance. Literature suggests that there exists a positive link between increased board gender diversity and a firm's financial performance. However, most studies are on firm not under any board gender quota, thus meaning the increased female presence is natural. In Norway, where ASA-boards were forced to increase the percentage of females to 40%, there is found a negative link after the implementation of the gender quota. The Norwegian government has, furthermore, debated whether such a quota should apply to AS-companies as well. We find evidence in this research that the Norwegian government should be careful in taking such steps.

We conducted a series of OLS and GLS regressions to examine the relationship between board gender diversity (measured by female percentage and a female indicator variable) and the financial performance (measured as ROA) of Norwegian AS-firms. The results confirmed our first hypotheses that the natural increase of females on the boards are causing firms to perform better financially. This result is robust to several tests, and support that increased gender diversity can be reached without destroying the shareholders' value.

Furthermore, supporting the first hypotheses, we find that gender diversity also lessens the predicted probability of being a bankrupt firm under our second hypothesis. Our findings indicate that all-female boards have a higher chance of bankruptcy than all-male boards, and that a board with both gender present had the least chance (a diverse board). This support quotas, in that there should at least be one of each gender on the board regarding long-term financial survival.

However, AS-firms are far more numerous than ASA-firms. They are also often smaller, owned by only a few people and are family-owned. That means that a board gender quota on AS-firms could cause a larger effect in society than the ASA-quota. Furthermore, the fact that gender quotas has not contributed to equality beyond the board is important (Langli, 2011). Based on our results, we suggest that the GBL implemented in 2008 is ready for modification, and that the Norwegian politicians should be careful in trying to implement it for AS-companies as well. Given that equality is the essential goal in the boardroom, policy-makers should therefore investigate other instruments for reaching equality. Instruments that do not destroy shareholders value and are economic efficient. Whether such instruments exist, is possible to achieve or identify is however an interesting topic for future research.

There are also important limitations to the research. There are factors not easily analyzed that might have been excluded, such as culture, education of board members or board dynamic. Lastly, it is for example known that more people in the northern part of Norway go personal bankrupt than those in the southern part (Dagens Næringsliv, 2017), therefore, locational or industrial analysis could also shed light on the many different type of companies that exist in Norway as well. Additionally, further studies in other countries could also validate the results.

Lastly, this research is of great importance because we prove there does not exist a "one-size fits all" type of case. The exact results and statistical certainty of our results vary among the many types of businesses and model specifications used. We therefore conclude that more research is needed on the topic, but that a positive increased shareholder value and economic effect are possible to achieve alongside board gender diversity without any quotas.

7 References

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8 Appendix

Table 8.1: Literature overview in chronological order

Authors	Year	Title	Period	Company type	No. firms	Area	Quota when analyzed	Quota in country	Dependent variable	Diversity measure	Link
Gordini & Rancati	2017	Gender diversity in the Italian boardroom and firm financial performance	2011-2014	Public/Listed	342	Italy	Yes	Yes, since 2012, but "stepwise" introduction	Tobin's Q & ROA	Female dummy & female ratio	Positive
Reguera-Alvarado	2017	Does Board Gender Diversity Influence Financial Performance? Evidence from Spain	2005-2009	Public/Listed	125	Spain	No	Yes, 40%. Had to comply by 2015	Tobin's Q	Female ratio, Blau's & Shannon index	Positive
Christiansen, Lin, Pereira, Topalova & Turk-Ariss	2016	Gender Diversity in Senior Positions and Firm Performance: Evidence from Europe	2013	Non-listed	2 million	34 European countries	Both	Both	ROA	Female ratio	Positive
Isidro & Sobral	2015	The Effects of Women on Corporate Boards on Firm Value, Financial Performance, and Ethical and Social Compliance	2010-2012	Public/Listed	<500	16 European countries	Both	Both	ROS, ROS & Tobin's Q	Female dummy (=1 if at least 30% female in board) & female ratio	No link with Tobin's Q, but positive link with ROA & ROS
Post & Byron	2015	Women on boards and firm financial performance: A meta-analysis	<2015	Both	140 studies	37 countries	Both	Both	Accounting returns and Tobin's Q	Multiple measures	Positive link on accounting returns and no link on market performance
Terjesen, Cuoto & Fransisco	2015	Does the presence of independent and female directors impact firm performance? A multi-country study of board diversity	2010	Public/Listed	3.876	47 countries	Both	Both	Tobin's Q & ROA	Female ratio	Positive
Joecks, Pull & Vetter	2013	Gender Diversity in the Boardroom and Firm	2000-2005	Public/Listed	151	Germany	No	Yes, 30%. Had to comply by 2016.	ROE	Dummy for several levels of females in	Both. Negative until 30% women

		Performance: What exactly constitutes a ‘‘critical mass?’’								board & Blau's index	is reached, then positive.
Lückerath-Rovers	2013	Women on boards and firm performance (Dutch)	2005-2007	Public/Listed	99	Nether-lands	No	Yes, 30%. "Comply or explain"	ROE, ROS, ROIC & EBIT	Female ratio	Positive
Matsa & Miller	2013	A Female Style in Corporate Leadership? Evidence from Quotas	2002-2009	Public/Listed	104	Norway	Yes	Yes, 40%. Had to comply by 2008.	ROA	Female ratio	Negative
Ahern & Dittmar	2012	The Changing of the Boards: the impact of firm Valuation of mandated female board representation	2001-2009	Public/Listed	248	Norway	Yes	Yes, 40%. Had to comply by 2008.	Tobin's Q, Leverage & ATO	Female ratio	Negative
Mahadeo, Soobaroyen & Hanuman	2012	Board Composition and Financial Performance: Uncovering the Effects of Diversity in an Emerging Economy	2007	Public/Listed	42	Mauritius	No	No	ROA	Female ratio	Positive
Bøhren & Strøm	2010	Governance and Politics: Regulating Independence and Diversity in the Board Room	1989-2002	Public/Listed	129-203	Norway	No, but done in order to test pre-quota	Yes, 40%. Had to comply by 2008.	ROA, ROS & Tobin's Q	Female ratio	Negative
Carter, D'Souza, Simkins & Simpson	2010	The Gender and Ethnic Diversity of US Boards and Board Committees and Firm Financial Performance	1998-2002	Public/Listed	641	US	No	No	ROA & Tobin's Q	Female ratio	No link
Haslam, Ryan, Kulich, Trojanowski & Atkins	2010	Investing with prejudice: The relationship between women’s presence on company boards and objective and subjective measures of company performance	2001-2005	Public/Listed	88-92	UK	No	Yes, 25% in 2015	ROA, ROE & Tobin´s Q	Female dummy & female ratio	No link with ROE and ROA, negative with Tobin's Q
Adams & Ferreira	2009	Women in the boardroom and their impact on governance and performance	1996-2003	Public/Listed	1.939	US	No	No	ROA & Tobin’s Q	Female dummy & female ratio	Negative
Miller & del Carmen	2009	Demographic Diversity in the Boardroom: Mediators	2003	Public/Listed	326	US	No	No	ROI & ROS	Female ratio & Blau's index	Positive

		of the Board Diversity–Firm Performance Relationship									
Campbell & Mínguez-Vera	2007	Gender Diversity in the Boardroom and Firm Financial Performance	1995-2000	Public/Listed	68	Spain	No	Yes, 40%. Had to comply by 2015	Tobin's Q	Female dummy, female ratio, Blau's & Shannon Index	Positive
Rose	2007	Does female board representation influence firm performance? The Danish evidence	1998-2001	Public/Listed	443	Denmark	No	No	Tobin's Q	Female dummy & female ratio	No link
Randöy, Oxelheim, Thomsen	2006	A Nordic Perspective on Corporate Board Diversity	1996-1998	Public/Listed	500	Norway, Sweden & Denmark	No	Both	ROA & Tobin's Q	Female ratio	No link
Smith, Smith & Verner	2006	Do women in top management affect firm performance? A panel study of 2,500 Danish firms	1993-2001	Public/Listed	2500	Denmark	No	No	Multiple accounting measures	Female ratio	Positive
Farrell & Hersch	2005	Additions to corporate boards: the effect of gender	1990-1999	Public/Listed	309	US	No	No	ROA	Female ratio	No link
Bonn, Phan & Yoshikawa	2004	Effects of Board Structure on Firm Performance: A Comparison Between Japan and Australia	1998	Public/Listed	Japan: 169, Australia: 500	Japan & Australia	No	No	ROA & Tobin's Q	Female ratio	No link in Japan, positive link in Australia
Carter, Simkins & Simpson	2003	Corporate Governance, Board Diversity, and Firm Value	1997	Public/Listed	638	US	No	No	ROA & Tobin's Q	Female ratio	Positive
Erhardt, Werbel & Shrader	2003	Board of Director Diversity and Firm Financial Performance	1998	Public/Listed	112	US	No	No	ROA & ROI	Female ratio	Positive

Gender diversity measurement methods used in listed literature:

Blau's and/or Shannon index	17%
Female dummy	33%
Female ratio	96%

Table 8.2: Quota for different countries

This table shows an overview of quotas for different countries. The mentioned year is the year when the companies had to comply to the quota. The mentioned countries are the countries that has been included in previous research within the field of gender diversity and gender performance.

Country	Board Gender Quotas
Australia	None
Austria	35% in 2018
Belgium	33% in 2017
Canada (Quebec)	50% in 2011
Denmark	None
Finland	None
France	40% in 2017
Germany	30% in 2016
Italy	33% in 2015
Japan	None
Netherlands	30% in 2015
Norway	40% in 2008
Mauritius	None
Portugal	None
Spain	40% in 2015
Sweden	None
Switzerland	None
United Kingdom	25% in 2015
United States	None

Table 8.3: The effect on ROA by AS and ASA-firms

This table shows the result of regressing ROA, on percentage of female and female dummy, a set of board specific variables and a set of company specific variables. The sample consist of AS and ASA-firms in the period 2000-2017. ROA is return on assets, measured as net income divided by the average of total assets. Female % is the percentage of female board members relative to the total number on board. Female dummy is an indicator variable that takes Value 1 if female board member(s), zero otherwise. Firm Size is measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is an indicator variable that takes value 1 if ultimate ownership is >90% of same family, zero otherwise. Column (1) and (3) are estimated with pooled OLS and with industry fixed effect, and clustered robust standard errors at the firm level. Column (2) and (4) use the random effect model with clustered robust standard errors at firm level. The first two columns are regressed with the female dummy, while the last two regressions are with percentage of female. All variables are interacted with a year dummy. Clustered robust standard errors in parentheses.

	(1) Pooled OLS	(2) Random Effect	(3) Pooled OLS	(4) Random Effect
Female %	0.0293***	0.0334***		
	(0.0017)	(0.0017)		
Female Dummy			0.0190***	0.0208***
			(0.0010)	(0.0010)
Firm Size	0.0819***	0.0815***	0.0818***	0.0815***
	(0.0005)	(0.0005)	(0.0005)	(0.0005)
Firm Age	-0.0011***	-0.0012***	-0.0011***	-0.0012***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Leverage	-0.0000**	-0.0000**	-0.0000**	-0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Board Size	-0.0279***	-0.0280***	-0.0294***	-0.0297***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Board Age	-0.0003***	-0.0003***	-0.0003***	-0.0003***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Tenure	0.0012***	0.0011***	0.0012***	0.0011***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Family-owned	0.0175***	0.0175***	0.0174***	0.0174***
	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Constant	-1.1358***	-1.1060***	-1.1321***	-1.1012***
	(0.0091)	(0.0080)	(0.0091)	(0.0079)
Industry FE	Yes	No	Yes	No
Time FE	Yes	Yes	Yes	Yes
R-Squared	0.0881	0.0837	0.0881	0.0837
Number of obs.	1,638,033	1,642,507	1,638,033	1,642,507
Number of firms	188,597	188,833	188,597	188,833

Table 8.4: The effect on ROA by ASA-firms

This table shows the result of regressing ROA on gender diversity measures and a set of control variables, with and without lagged variables by 1 year. The regression is performed on only ASA-companies in the period from 2000 to 2017. ROA is return on assets, measured as net income divided by the average of total assets. Female % is the percentage of female board members relative to the total number on the board. Female Dummy is an indicator variable that takes Value 1 if female board member(s), zero otherwise. Firm Size is measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Column (1), (2) and (3) have Female % as gender diversity measure, where column (3) and (8) are with lagged explanatory variables (except Firm Age). Column (4), (5) and (6) have Female Dummy as gender diversity measure, where column (6) are with lagged explanatory variables (except Firm Age). Clustered robust standard errors in parentheses.

	(1) Pooled OLS	(2) RE	(3) RE Lagged	(4) Pooled OLS	(5) RE	(6) RE lagged
Female %	-0.0124	0.0132	0.0606			
	(0.0688)	(0.0643)	(0.0579)			
Female Dummy				0.0211	0.0187	0.0230
				(0.0236)	(0.0226)	(0.0213)
Firm Size	0.0913***	0.0839***	0.0407***	0.0911***	0.0838***	0.0405***
	(0.0124)	(0.0113)	(0.0101)	(0.0124)	(0.0113)	(0.0100)
Firm Age	-0.0001	-0.0001	0.0009***	-0.0001	-0.0001	0.0009***
	(0.0005)	(0.0004)	(0.0003)	(0.0005)	(0.0004)	(0.0003)
Leverage	-0.0000	-0.0000	-0.0001***	-0.0000	-0.0000	-0.0001***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Board Size	-0.0210***	-0.0216***	-0.0113**	-0.0221***	-0.0224***	-0.0116**
	(0.0063)	(0.0059)	(0.0057)	(0.0063)	(0.0060)	(0.0057)
Board Age	-0.0043***	-0.0028*	-0.0004	-0.0042***	-0.0028*	-0.0005
	(0.0017)	(0.0015)	(0.0011)	(0.0016)	(0.0015)	(0.0011)
Tenure	0.0057***	0.0050***	0.0022	0.0057***	0.0050***	0.0022
	(0.0015)	(0.0017)	(0.0015)	(0.0015)	(0.0017)	(0.0015)
Family-owned	0.0316	0.0325*	0.0250	0.0311	0.0322*	0.0252
	(0.0198)	(0.0189)	(0.0163)	(0.0198)	(0.0189)	(0.0163)
Constant	-1.7751***	-1.5438***	-0.8981***	-1.7761***	-1.5421***	-0.8914***
	(0.2361)	(0.2024)	(0.1695)	(0.2365)	(0.2031)	(0.1684)
Industry FE	No	No	No	No	No	No
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.1980	0.1750	0,1334	0.1991	0.1757	0.1333
No. of obs.	2,746	2,884	2,773	2,746	2,884	2,773
No. of firms	402	427	413	402	427	413

*** p<0.01, ** p<0.05, * p<0.1

Table 8.5: The effect on ROA with lagged variables in two periods

This table shows the result of regressing ROA with and without lagged explanatory variables by 1 year. The regression is performed on AS-firms in two periods: from 2000 to 2017 and from 2005 to 2017. ROA is return on assets, measured as net income divided by the average of total assets. Female % is the percentage of female board members relative to the total number on board. Female dummy is an indicator variable that takes Value 1 if female board member(s), zero otherwise. Firm Size is measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is an indicator variable that takes value 1 if ultimate ownership is >90% of same family, zero otherwise. All regressions are performed with the random effect model and all variables are interacted with time dummies. In the first four columns the female percentage is used, while in the four last columns the female dummy is used. Column (1), (2), (5) and (6) are regressed in the original time period from 2000 to 2017, where column (2) and (6) are with lagged explanatory variables. Column (3), (4), (7) and (8) are regressed in the new time period from 2005 to 2017, where column (4) and (8) are with lagged explanatory variables. Clustered robust standard errors in parentheses.

	(1) RE 2000-2017	(2) RE lagged 2000-2017	(3) RE 2005-2017	(4) RE lagged 2005-2017	(5) RE 2000-2017	(6) RE lagged 2000-2017	(7) RE 2005-2017	(8) RE lagged 2005-2017
Female %	0.0339***	0.0042**	0.0335***	0.0003**				
	(0.0017)	(0.0018)	(0.0018)	(0.0019)				
Female D.					0.0211***	0.0067***	0.0205***	0.0035***
					(0.0010)	(0.0010)	(0.0011)	(0.0011)
Firm Size	0.0819***	0.0244***	0.0831***	0.0245***	0.0818***	0.0244***	0.0830***	0.0246***
	(0.0005)	(0.0006)	(0.0006)	(0.0006)	(0.0005)	(0.0006)	(0.0006)	(0.0006)
Firm Age	-0.0012***	0.0007***	-0.0012***	0.0006***	-0.0012***	0.0007***	-0.0012***	0.0006***
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Leverage	-0.0000**	-0.0000	-0.0000**	-0.0000	-0.0000**	-0.0000	-0.0000**	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Board Size	-0.0276***	-0.0121***	-0.0290***	-0.0112***	-0.0293***	-0.0127***	-0.0306***	-0.0116***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0005)
Board Age	-0.0002***	-0.0002***	-0.0004***	-0.0003***	-0.0003***	-0.0002***	-0.0004***	-0.0003***
	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Tenure	0.0011***	0.0004***	0.0015***	0.0009***	0.0011***	0.0004***	0.0015***	0.0009***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Fam. Owned	0.0172***	0.0147***	0.0158***	0.0130***	0.0171***	0.0146***	0.0156***	0.0130***
	(0.0008)	(0.0009)	(0.0009)	(0.0010)	(0.0008)	(0.0009)	(0.0009)	(0.0010)
Constant	-1.1107***	-0.3335***	-1.0882***	-0.2966***	-1.1059***	-0.3343***	-1.0829***	-0.2978***
	(0.0080)	(0.0082)	(0.0086)	(0.0091)	(0.0080)	(0.0081)	(0.0085)	(0.0090)
Industry FE	No	No	No	No	No	No	No	No
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0849	0.0384	0.0880	0.0405	0.0849	0.0386	0.0880	0.0406
No. of obs.	1,639,623	1,627,572	1,330,220	1,236,034	1,639,623	1,627,572	1,330,220	1,236,034
No. of firms	188,635	188,179	174,179	169,208	188,635	188,179	174,179	169,208

*** p<0.01, ** p<0.05, * p<0.1

Table 8.6: The effect on ROA by reducing variables

This table shows the result of regressing ROA on percentage of female and a set of chosen variables. The sample consist of AS-firms in the time period 2000-2017. Per regression one variable is dropped, starting with a full model reducing one variable by time. ROA is return on assets, measured as net income divided by the average of total assets. Female % is the percentage of female board members relative to the total number on board. Firm Size is the size of firm measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is an indicator variable that takes value 1 if ultimate ownership is >90% of same family, zero otherwise. All regressions are performed with the random effect model and all variables are interacted with time dummies. Clustered robust standard errors in parentheses.

Female %	0.0339***	0.0347***	0.0352***	0.0358***	0.0235***	0.0235***	0.0234***	-0.0045**
	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0017)	(0.0018)
Firm Size	0.0819***	0.0817***	0.0821***	0.0821***	0.0787***	0.0788***	0.0783***	
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	
Firm Age	-0.0012***	-0.0012***	-0.0009***	-0.0010***	-0.0010***	-0.0010***		
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		
Leverage	-0.0000**	-0.0000**	-0.0000*	-0.0000*	-0.0000*			
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)			
Board Size	-0.0276***	-0.0285***	-0.0278***	-0.0277***				
	(0.0004)	(0.0004)	(0.0004)	(0.0004)				
Board Age	-0.0002***	-0.0003***	-0.0002***					
	(0.0000)	(0.0000)	(0.0000)					
Tenure	0.0011***	0.0011***						
	(0.0001)	(0.0001)						
Fam. Owned	0.0172***							
	(0.0008)							
Constant	-1.1107***	-1.0918***	-1.0989***	-1.1082***	-1.1199***	-1.1221***	-1.1162***	-0.0154***
	(0.0080)	(0.0079)	(0.0074)	(0.0073)	(0.0074)	(0.0074)	(0.0073)	(0.0012)
Industry FE	No	No	No	No	No	No	No	No
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.0849	0.0840	0.0837	0.0837	0.0730	0.0728	0.0732	0.0010
No. of obs.	1,639,623	1,639,623	1,834,712	1,834,712	1,834,712	1,834,712	1,834,909	1,840,729
No. of firms	188,635	188,635	222,182	222,182	222,182	222,182	222,182	222,550

*** p<0.01, ** p<0.05, * p<0.1

Table 8.7: The effect on ROA by reducing lagged variables

This table shows the result of regressing ROA on female dummy lagged and a set of lagged explanatory variables by 1 year. The sample consist of AS-firms in the time period 2000-2017. Per regression one variable is dropped, starting with a full model reducing one variable by time. ROA is return on assets, measured as net income divided by the average of total assets. L.Female Dummy is a lagged indicator variable that takes value 1 if female board member(s), zero otherwise. L.Firm Size is the lagged size of firm measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. L.Leverage is the lagged company's debt level, measured as the total debt to total assets. L.Board Size is the lagged number of board members. L.Board Age is the lagged mean age of all board members. L.Tenure is the lagged amount of years the current CEO has had the position. L.Family-owned is a lagged indicator variable that takes value 1 if ultimate ownership is >90% of same family, zero otherwise. All regressions are performed with the random effect model and all variables are interacted with time dummies. Clustered robust standard errors in parentheses.

L.Female D.	0.0067***	0.0073***	0.0076***	0.0078***	-0.0028***	-0.0028***	-0.0025**	-0.0024**
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)
L.Firm Size	0.0244***	0.0243***	0.0240***	0.0240***	0.0221***	0.0222***	0.0227***	
	(0.0006)	(0.0006)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	
Firm Age	0.0007***	0.0007***	0.0008***	0.0008***	0.0008***	0.0008***		
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		
L.Leverage	-0.0000	-0.0000	-0.0000**	-0.0000**	-0.0000**			
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)			
L.Board Size	-0.0127***	-0.0135***	-0.0133***	-0.0133***				
	(0.0004)	(0.0004)	(0.0004)	(0.0004)				
L.Board Age	-0.0002***	-0.0002***	-0.0001***					
	(0.0001)	(0.0001)	(0.0000)					
L.Tenure	0.0004***	0.0004***						
	(0.0001)	(0.0001)						
L.Family-owned	0.0146***							
	(0.0009)							
Constant	-0.3343***	-0.3173***	-0.3172***	-0.3228***	-0.3237***	-0.3260***	-0.3316***	-0.0153***
	(0.0081)	(0.0080)	(0.0074)	(0.0073)	(0.0074)	(0.0074)	(0.0073)	(0.0012)
Industry FE	No	No	No	No	No	No	No	No
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0386	0.0374	0.0377	0.0377	0.0313	0.0309	0.0317	0.0010
No. of obs.	1,627,572	1,627,572	1,829,684	1,829,684	1,829,684	1,829,684	1,829,882	1,832,336
No. of firms	188,179	188,179	222,103	222,103	222,103	222,103	222,103	222,165

*** p<0.01, ** p<0.05, * p<0.1

Table 8.8: The effect on ROA by reducing variables

This table shows the result of regressing ROA on the female dummy and a set of variables. The sample consist of AS-firms in the time period 2000-2017. Per regression one variable is dropped, starting with a full model reducing one variable by time. ROA is return on assets, measured as net income divided by the average of total assets. Female Dummy is an indicator variable that takes value 1 if female board member(s), zero otherwise. Firm Size is the size of firm measured as the natural logarithm of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is an indicator variable that takes value 1 if ultimate ownership is >90% of same family, zero otherwise. All regressions are performed with the random effect model and all variables are interacted with time dummies. Clustered robust standard errors in parentheses.

Female Dummy	0.0211***	0.0217***	0.0220***	0.0223***	-0.0011	-0.0011	-0.0015	-0.0009
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)
Firm Size	0.0818***	0.0817***	0.0820***	0.0820***	0.0785***	0.0786***	0.0781***	
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	
Firm Age	-0.0012***	-0.0012***	-0.0009***	-0.0010***	-0.0010***	-0.0010***		
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		
Leverage	-0.0000**	-0.0000**	-0.0000*	-0.0000*	-0.0000*			
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)			
Board Size	-0.0293***	-0.0302***	-0.0295***	-0.0294***				
	(0.0004)	(0.0004)	(0.0004)	(0.0004)				
Board Age	-0.0003***	-0.0003***	-0.0002***					
	(0.0000)	(0.0000)	(0.0000)					
Tenure	0.0011***	0.0011***						
	(0.0001)	(0.0001)						
Fam. Owned	0.0171***							
	(0.0008)							
Constant	-1.1059***	-1.0870***	-1.0942***	-1.1040***	-1.1133***	-1.1155***	-1.1096***	-0.0158***
	(0.0080)	(0.0078)	(0.0074)	(0.0072)	(0.0073)	(0.0073)	(0.0072)	(0.0012)
Industry FE	No	No	No	No	No	No	No	No
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0849	0.0840	0.0838	0.0837	0.0726	0.0724	0.0729	0.0010
No. of obs.	1,639,623	1,639,623	1,834,712	1,834,712	1,834,712	1,834,712	1,834,909	1,840,729
No. of firms	188,635	188,635	222,182	222,182	222,182	222,182	222,182	222,550

*** p<0.01, ** p<0.05, * p<0.1

Table 8.9: Logit regression by size of company measured by assets

The table shows the results from regressing bankruptcy, by firm size. The sample of AS-firms is split into four quartiles by assets, as a measure of the firm: micro firms (first quartile), small firms (second quartile), medium firms (third quartile) and large firms (fourth quartile). The sample consist of a 50% random sample of AS-firms in the period 2005-2017. Bankruptcy equals 1 if a firm went bankrupt that year, zero otherwise. Female Dummy equals 1 if there are one or more females present on the board, zero otherwise. ROA is return on assets, measured as net income divided by the average of total assets. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned equals 1 if ultimate ownership is >90% of same family, zero otherwise. Clustered robust standard errors in parentheses.

	Micro Firms			Small Firms		
Firm size measured by Assets	Coefficients	Odds	%	Coefficients	Odds	%
Female Dummy	0.0652***	1.0674	6.74%	0.0248	1.0251	2.51%
	(0.0235)			(0.0404)		
ROA	-0.3204***	0.7259	-27.41%	-0.3205***	0.7258	-27.42%
	(0.0179)			(0.0654)		
Firm Age	-0.0138***	0.9863	-1.37%	-0.0058***	0.9942	-0.58%
	(0.0016)			(0.0022)		
Leverage	0.0000	1.0001	0.01%	-0.3918***	0.6758	-32.42%
	(0.0000)			(0.0586)		
Board Size	-0.0279***	0.9725	-2.75%	-0.0307*	0.9698	-3.02%
	(0.0101)			(0.0167)		
Board Age	0.0108***	1.0109	1.09%	0.0271***	1.0275	2.75%
	(0.0011)			(0.0019)		
Tenure	0.0179***	1.0181	1.81%	0.0129***	1.0130	1.30%
	(0.0028)			(0.0040)		
Family-owned	1.7730***	5,8885	488,85 %	1.3611***	3,9005	290,05 %
	(0.0644)			(0.0704)		
Constant	-3.2334***			-5.3310***		
	(0.1124)			(0.2077)		
Industry FE	Yes			Yes		
Time FE	Yes			Yes		
Pseudo R2	0.0195			0.0167		
No. of observations	143.962			163.4		
Predictive margins Female Dummy	Margin	z	P>|z|	Margin	z	P>|z|
0 = Male	0.0735	86.98	0.0000	0.0212	48.23	0.0000
	(0.0000)			(0.0000)		
1 = Female	0.0780	58.05	0.0000	0.0217	31.36	0.0000
	(0.0000)			(0.0000)		

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	Medium Firms			Large Firms		
	Coefficients	Odds	%	Coefficients	Odds	%
Female Dummy	0.1493**	1.1610	16.10%	0.2762***	1.3182	31.82%
	(0.0626)			(0.1012)		
ROA	-0.3041**	0.7378	-26,22 %	0.3809	1.4636	46,36 %
	(0.1279)			(0.2372)		
Firm Age	-0.0087***	0.9913	-0,87 %	-0.0094**	0.9906	-0,94 %
	(0.0030)			(0.0039)		
Leverage	-1.0150***	0.3624	-63,76 %	-1.4254***	0.2404	-75,96%
	(0.1076)			(0.1864)		
Board Size	-0.0912***	0.9128	-8,72 %	-0.1447***	0.8653	-13,47 %
	(0.0238)			(0.0334)		
Board Age	0.0280***	1.0284	2,84 %	0.0105**	1.0106	1,06 %
	(0.0031)			(0.0053)		
Tenure	0.0050	1.0050	0,50 %	-0.0366***	0.9641	-3,59 %
	(0.0057)			(0.0091)		
Family-owned	1.3191***	3.7401	274,01 %	1.9005***	6.6862	568,62 %
	(0.0982)			(0.1726)		
Constant	-5.3431***			-4.4331***		
	(0.2703)			(0.4364)		
Industry FE	Yes			Yes		
Time FE	Yes			Yes		
Pseudo R2	0.0175			0.0313		
Observations	169.508			171.113		
Predictive margins Female Dummy	Margin	z	P>|z|	Margin	z	P>|z|
0 = Male	0.0084	31.76	0.0000	0.0028	18.37	0.0000
	(0.0000)			(0.0000)		
1 = Female	0.0097	19.57	0.0000	0.0037	12.36	0.0000
	(0.0000)			(0.0000)		

*** p<0.01, ** p<0.05, * p<0.1

Table 8.10: Logit regression by size of company measured by revenue

The table shows the results from regressing bankruptcy, by firm size. The sample of AS-firms is split into four quartiles by revenue, as a measure of the firm: micro firms (first quartile), small firms (second quartile), medium firms (third quartile) and large firms (fourth quartile). The sample consist of a 50% random sample of AS-firms in the period 2005-2017. Bankruptcy takes the value 1 if a firm went bankrupt that year, and zero otherwise. Female Dummy is equal to 1 if there are one or more females present on the board, and zero otherwise. ROA is return on assets, measured as net income divided by the average of total assets. Board Size is the number of board members. Board Age is the mean age of all board members. Tenure is the amount of years the current CEO has had the position. Family-owned is equal to 1 if ultimate ownership is >90% of same family, zero otherwise. Firm Age is the amount of years since the firm's foundation. Leverage is the company's debt level, measured as the total debt to total assets. All variables are interacted with industry and time dummies.

Firms Size measured by Revenue	Micro Firms			Small Firms		
	Coefficients	Odds	%	Coefficients	Odds	%
Female Dummy	0.2574***	1.2936	29.36%	0.1689***	1.1840	18.40%
	(0.0291)			(0.0321)		
ROA	-0.4221***	0.6557	-34.43%	-0.4678***	0.6264	-37.36%
	(0.0226)			(0.0326)		
Firm Age	-0.0224***	0.9778	-2.22%	-0.0153***	0.9848	-1.52%
	(0.0017)			(0.0022)		
Leverage	0.0000	1.0001	0.01%	0.0003	1.0030	0.30%
	(0.0000)			(0.0003)		
Board Size	-0.1062***	0.8992	-10.08%	-0.0385***	0.9622	-3.78%
	(0.0120)			(0.0140)		
Board Age	0.0104***	1.0105	1.05%	0.0167***	1.0168	1.68%
	(0.0013)			(0.0015)		
Tenure	0.0184***	1.0186	1.86%	0.0006	1.0006	0.06%
	(0.0030)			(0.0037)		
Family-owned	1.7730***	5.8885	488,85%	1.3611***	3.9005	290,05%
	(0.0644)			(0.0704)		
Constant	-3.2811***			-5.3103***		
	(0.1347)			(0.1661)		
Industry FE and Time FE	Yes			Yes		
Pseudo R2	0.0889			0.0431		
Observations	143.128			152.926		
Predictive margins Female Dummy	Margin	z	P>|z|	Margin	z	P>|z|
0 = Male	0.0490	74.19	0.0000	0.0351	60.63	0.0000
	(0.0000)			(0.0000)		
1 = Female	0.0620	46.38	0.0000	0.0412	41.74	0.0000
	(0.0001)			(0.0000)		

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	Medium Firms			Large Firms		
	Coefficients	Odds	%	Coefficients	Odds	%
Female Dummy	0.0019	1.0019	0.19%	0.2024**	1.2243	22.43%
	(0.0497)			(0.0789)		
ROA	-0.7497***	0.4725	-52.75%	-1.4777***	0.2282	-77.18%
	(0.0689)			(0.1208)		
Firm Age	-0.0087***	0.9913	-0.87%	-0.0321***	0.9684	-3.16%
	(0.0029)			(0.0046)		
Leverage	0.0016	1.0016	0.16%	0.0202	1.0204	2.04%
	(0.0015)			(0.0505)		
Board Size	0.0619***	1.0639	6.39%	-0.2976***	0.7426	-25.74%
	(0.0196)			(0.0301)		
Board Age	0.0170***	1.0171	1.71%	-0.0067*	0.9933	-0.67%
	(0.0025)			(0.0036)		
Tenure	0.0060	1.0060	0.60%	-0.0231***	0.9772	-2.28%
	(0.0052)			(0.0080)		
Family Owned	1.3191***	3.740 1	274,01%	1.9005***	6.6862	568,62%
	(0.0982)			(0.1726)		
Constant	-6.8224***			-5.9659***		
	(0.2836)			(0.4911)		
Industry FE and Time FE	Yes			Yes		
Pseudo R2	0.0268			0.0786		
Observations	171.793			181.069		
Predictive margins Female Dummy	Margin	z	P>|z|	Margin	z	P>|z|
0 = Male	0.0351365	36.91	0.0000	0.0049078	25.98	0.0000
	(0.0000)			(0.0000)		
1 = Female	0.0412	26.03	0.0000	0.0060	15.19	0.0000
	(0.0000)			(0.0000)		

Clustered robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8.11: Number of owners and bankruptcies

No. of Owners	Freq.	%
Only 1	18,604	91%
Above 1	1,816	9%
Total	20,420	100%

No. of Bankruptcies	Freq.	%
Only one	373,771	49%
Above 1	396,171	51%
Total	769,942	100%