Firm Performance and Gender Quotas in Supervisory Boards

Evidence from Dutch Firms

MSc Finance 2015-2016

Dissertation

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Abstract

In 2013, a new law required Dutch companies to have a 30% equal gender representation in their board of directors, with an implementation deadline of January 2016. We use an unbalanced panel dataset of 70 Dutch firms to investigate the impact this quota has had on firms' financial performance as measured by Tobin's q. Although the results are statistically insignificant, we find that boards with women in them perform better financially than companies without women in their boards. Boards with 30% or more of equal gender representation however, do not necessarily have that same effect. Additionally, stock prices dropped on the announcement and implementation dates of this quota. This paper encourages future research to conclude whether European countries should continue implementing quotas in order to tackle the human rights issue of gender inequality.

Contents

1 Introduction

The board of directors is a vital mechanism within a corporation that controls a firm's corporate governance. Due to its importance in nature, it is essential that its composition allows for efficient and adequate cooperation. Studies have shown that having a diverse and independent board improves the quality of control as it generates a comparative advantage. As Carter et al. [2003] argue, independence of boards lead to higher diversity, and generate a positive impact on firm value. Agency theory is a key reason for the independence of boards to have become relevant today, addressing the inefficiencies from the separation of company control and ownership [Shleifer and Vishny, 1997].

Diversity is one of the factors that increases the level of independence, possibly improving firm performance. It can take form in multiple ways: racial, ethnic, geographical, age, religious or gender diversity. This research addresses only one of these forms of diversity; gender diversity, which became a growing topic of research due to, in part, recent political involvements.

Improvements in gender diversity of boards only began occurring in the twenty-first century, when the issue of gender equality became an increased concern globally. The United Nations, among other organizations, has found worldwide gender inequality levels to be alarming. Consequently, in 2015 they formally committed themselves to combat this problem by including it in its newly adopted Sustainable Development Goals, with Goal 5: "to achieve gender equality and empower all women and girls" [United Nations, 2015]. The United Nations focus specifically on the disadvantages a woman faces in both paid and unpaid work [Selim Jahan, 2015]. The United Nations Development Programme, responsible for developing the Human Development Index, has also established a Gender Inequality Index. This index shows that European countries rank the highest in gender equality, where 17 of the top 20 countries are European [United Nations Development Programme, 2015]. Although this in itself is encouraging, equality of gender is still inexistent in these countries, particularly in the labour force, where women persistently face barriers. These barriers are also referred to as the *glass ceiling*.

Worldwide attempts have been made to shatter this glass ceiling. In Europe, governments and the European Parliament have decided to take action in battling this human-rights issue. Throughout Europe, several countries have enforced quota legislations to reduce the inequality between men and women on a corporate level, and in doing so establish a gender-parity board of directors policy.

This thesis will analyse the case of the Netherlands, one of the countries that implemented a quota to balance the representation of men and women in top management positions. Specifically, it will investigate the following question:

To what extent have Dutch companies been financially affected by the gender quota on board of directors?

In doing so, it will look at several aspects of the quota, including the type of companies that are affected, their sector, and the changes the firms experience financially. The rest of this paper will be split up into five chapters. Chapter 2 elaborates on existing literature regarding this topic, including research papers on the role of women in boards, and the role of quotas on firms. It will further define the hypotheses of this thesis. Chapter 3 will provide the data description and empirical methodology, followed by several descriptive statistics. Furthermore, chapter 4 discusses the empirical results, while chapter 5 disserts the limitations of this research and implications for future research. Finally, chapter 6 presents concluding remarks.

2 Existing Literature and Hypotheses

In the wake of political ambitions to approach gender parity, research on the matter has been expanding. Nevertheless, it continues to be inconclusive. To date, most analyses on gender equality in boards put specific emphasis on the effect women have on firm performance. Little research has been conducted however, on the effect the quota implementation of certain European countries has had on firm performance. The conducted research on quota implementations have focused specifically on Norway, the pioneer country in introducing legislation to reduce the gender gap in senior management. Studies on the effects of quotas in other countries are still very limited, as most research continues to focus on the influence of women in their boards. This section will discuss previous literature that has analysed both aspects of gender equality in top management. Additionally, it will provide the hypotheses that this paper will investigate.

2.1 Glass Ceiling

In 2007, McKinsey & Company started the Women Matter initiative. Publishing yearly reports expressing the importance of women in the workforce. In their first report, they suggest that companies with strong female representation in their boards, are also the ones that achieve best performance [McKinsey & Company, 2007]. They believe there are two main reasons for which women are having a hard time shattering the glass ceiling, defined as a barrier that has been set up by an unfair system preventing women (or minorities) from obtaining senior positions in the workplace [Oxley, 2013]. These reasons are due to the "dominant model" and the necessity to master the male code. Firstly, the dominant model refers to the expectation that a person in a management position should be available 'anywhere, anytime'. However, this mentality is difficult to integrate with the "double burden syndrome" women face. McKinsey & Company refer to this double burden as the combination between a woman's paid and unpaid work, also referred to as domestic obligations. They found that in Europe, on average, women still spend double the time on domestic responsibilities than men, an obstacle that reduces the chances of women being able to conform with the dominant model. Secondly, the mastering of the male code refers to a male's characteristics, specifically their ability to be assertive. When holding a management role, we generally expect an assertive leader, this is more often found in men. Women on the other hand tend to be humbler, as such have more difficulty identifying themselves with success. Consequently, they are perceived as less ambitious than men, and ultimately causes more women to opt out of such career. However, too much assertiveness in a woman may result in portraying a bad-tempered attitude, for which a woman may find themselves helpless when trying to show their ability to perform in

top positions [Oakley, 2000]. These barriers, among others, keep women from shattering the glass ceiling.

2.2 Importance of Gender Equality

Despite the barriers we face today, having women in senior management positions can be beneficial for different reasons. In their progress report of 2012, the European Commission split these benefits into two: microeconomic and macroeconomic importance of a balanced workforce.

The microeconomic importance is explained by the mirroring of economic behaviour, improved organisational and financial performance and the creativity and diversity women provide. Firstly, in the United States for example, approximately 85% of all consumer spending in 2015 was done by women. Employing more women would lead to more insight on consumer spending behaviour, and thus, better mirroring the market [Bloomberg, 2016]. Robinson and Dechant [1997] add to Bloomberg's statement of consumer spending by conducting a poll among human resources executives, in which they found that the top five reasons to increase board diversity are: for better utilization of talent, increased marketplace understanding, more understanding in leadership positions, enhanced creativity and improved team problem-solving. McKinsey & Company [2013] also found that stock price growth and returns on sales were stronger compared to rivals with smaller gender diversity in their boards. Additionally, companies with weak governance, experience a larger positive impact when female board members are employed [Smith et al., 2006]. Carter et al. [2003] also argue that creativity and diversity in the workforce allow for more alternatives to be evaluated, consequently improving decision processes. Finally, agency theory is essential to take into account as independency in boards is fundamental to good conduct. [Shleifer and Vishny, 1997]. Dependency tends to be lower for women as they better prepare for meetings than men do, allowing them to form more critical discussions [Huse and Solberg, 2006].

In terms of the macroeconomic importance, properly using our talent pool could support the constant changes in our demographics. The proportion of educated women compared to employed women is unequal and provided that we have an aging population, Europe will face a shortfall in skilled labour if the available talent pool continues to be misused [European Commission, 2012, McKinsey & Company, 2007]. Breaking the glass ceiling will thus help reduce the gender gap and allow the economy to grow.

2.3 Norwegian Case

Several European countries have identified that the glass ceiling problem must be tackled and have concluded that political involvement is essential for women

to move up the ladder. In 2003, Norway was the first European country to approve a law to implement a quota aimed at reducing gender inequality in directive positions of large firms. In their research, Ahern and Dittmar [2012] find that despite having successfully adopted the 40% quota, it significantly decreased the stock prices on the day the law was announced and found a decrease in Tobin's q over the preceding years. Their conclusions were not positive towards the sudden quota implementation, having found a decrease in operating performance and less experienced board members. Similarly, Bertrand et al. [2014] researched the Norwegian case finding little evidence of improvement in the economy other than the achievement of more gender-equal firms in the country.

In spite of the negative findings on firm financial performance in Norway, many researchers, including McKinsey & Company [2007] and Noland et al. [2016], suggest that women in fact do have a positive impact on performance, such that in the long term a quota should be profitable. It is for this reason that countries around Europe were encouraged to implement similar legislations in order to tackle the human rights issue of gender inequality. The European Commission [2012] published *A Europe 2020 Initiative*, explaining what actions governments are currently taking to improve gender equality in top management, and what actions the European Union is willing to take if countries do not succeed in implementing these quotas.

2.4 Dutch Quota

Much like Norway, other European countries have implemented legislations to battle gender inequality in the labour market and thereby reducing the gender gap. Among these countries are France, Italy and Belgium, which enforced binding quotas with sanctions. For Denmark, Finland and Greece, the quota is applied only to state-owned companies. And for Spain and the Netherlands, no sanctions are attached to its quotas [European Commission, 2012]. This paper will focus specifically on the Netherlands, where the level of implementation varied greatly from Norway, bringing light to new literature and findings.

Dutch firms generally have a two-tier corporate governance system, which comprises of the executive and supervisory board. This dual board system allows for a clear distinction to be made between executive and non-executive members in order to avoid agency problems. Throughout this research, the supervisory boards will be analysed and will also be referred to as the board or board of directors. As Goodstein et al. [1994] suggest, the supervisory boards main responsibilities can be split up into three functions: an institutional, a monitoring and a strategic decision making and ratification function. An institutional function refers to the network of the members; the larger the size or diversity of the board, the

more resources their members can provide. The second responsibility, monitoring, refers to the agency theory, in which the board represent the shareholders when monitoring and governing the management boards. As such it attempts to limit the conflicts of interest between management and stockholders [Fama and Jensen, 1998]. Finally, the decision making function involves the strategic planning of the firm, which is done in meetings between the board of directors and the executive board. These three main duties support the essence of diversity in the boards in order to best accomplish their responsibilities.

On June 6, 2011 the Dutch government passed a law on gender balance in boards, to be effectuated on January 1, 2013 and with an expiration date of January 1, 2016. This legislation was created after the European Parliament had debated about EU-wide gender equality reforms of senior management. The law was an amendment to the Civil Code, stating that by January 2016, boards should be represented by at least 30% of either gender [European Commission, 2012]. The legislation applied only to large public and private limited companies and only to those that fulfilled at least two of the following three requirements: the company must have more than 250 employees, an annual turnover of more than 35 million euros, or more than 17.5 million euros in total assets [Wilma Hendrikse and Babette Pouwels, 2016]. This legislation included a penalty of 'comply or explain'. Firms that did not comply with the new law by 2016, were required to explain in their annual reports the reason for not achieving the minimum threshold and what they have already done to try to achieve it. Additionally, a strategy for future compliance was required in their report [Wilma Hendrikse and Babette Pouwels, 2016].

In order to make it more feasible for firms to apply this law, the Dutch Minister of Education, Culture and Research, Jet Bussemaker, initiated a database together with Hans de Boer (CEO of VNO-NCW). In this database, firms can find women that are highly qualified to be in boards [Top Vrouwen, 2015].

Although the Netherlands has increased its female representation by more than most European countries over the five-year period, from October 2010 until April 2015, it has still failed to reach its 30% quota [European Commission, 2015], largely due to its 'no-sanction' policy, giving little incentives for firms to change their governance code.

2.5 Hypotheses

As previously discussed, this paper will aim at broadening the literature in understanding the effect of the quota on firms' financial performance in the Netherlands. Several hypotheses have been formulated based on previous literature, in order to conduct a research that will allow for a broader understanding of gender quotas.

Hypothesis 1: A company's Tobin's q is higher when there is more gender-diversity in boards.
This first hypothesis investigates the effect gender diversity in boards has on the financial performance indicator Tobin's q. Previous research suggests that having a more balanced board has micro and macroeconomic benefits for firm performance. These findings therefore suggest that Tobin's q should be higher for firms that have attained higher gender equality in their boards. Board diversity is expressed as the number of women compared to the total number of board members. This hypothesis is relevant in order to understand changes in Tobin's q over the years and throughout different board compositions in the Netherlands.

Hypothesis 2: A company that has achieved the quota has a higher Tobin's q than a company with no women in their supervisory board.
As the Netherlands has enforced a quota without sanctions, not all firms have proceeded to increase the diversity of their boards, implying that some companies continue to have boards consisting of only men. This hypothesis investigates the differences in firm performance between the firms that have achieved the 30% quota, and those who still have no women. It is also formulated based on previous research that suggests that having women on boards is beneficial for a firm's financial performance. It, however, adds to the literature by investigating whether having 30% or more of equal gender representation in boards also provides better results than having no women. It is important to investigate these two extremes to understand whether firms that have kept their boards un-diversified in terms of gender, have a reason to do so.

Hypothesis 3: The quota implementation in the Netherlands has led to better firm financial performances in firms that have achieved the quota compared to those that have not.
Although existing literature on Norway's law enforcement suggests that companies that have employed the quota perform worse financially than they did before applying it, we do not expect this to happen in Dutch firms. This is because the Netherlands has a 'no-sanction' based quota. Therefore, companies are likely to employ women only when a change in the board is necessary, at which point they have the option to choose for a new member. Additionally, firms are not required to have 30% equal gender representation from one year to the next, it is a three-year process. This allows Dutch firms to consider each candidate fairly. It is for that reason that the hypothesis states that a firm's financial performance will be better for countries having implemented the quota than those that have not.

3 Data and Methodology

The following section will elaborate on the data sample and how it was collected to provide information for answering the research question and test the hypotheses. Furthermore, it will present the methodology of the conducted research and finally, descriptive statistics will be rendered.

3.1 Data Description

In order to conduct this research, an unbalanced panel data was set up of Dutch public firms, selecting companies that trade on the Euronext Amsterdam Stock Exchange. Although private companies were also required to apply the legislation to their governance structures, they are not included in the sample. This is because they are not obliged to release reports to the public about their firms, rendering it difficult to gather data on private corporations.

Most data was gathered from Orbis, a database by Bureau van Dijk that provides information on over 200 million businesses worldwide. Despite its wide array of data and information, it lacks in historic board composition data of several European countries, including that of the Netherlands[1]. Therefore, only Dutch firms are included in this research, for which the data on historic board compositions, including the number of board members, number of women in boards and their names, were collected from the annual reports of each individual firm of every year in question. When the gender of the board member was unspecified and not evident, they were additionally looked up on the company website, for indications of 'his' or 'her' references. If this lead to no conclusive results on the gender of the member, they additionally looked them up on LinkedIn.

The sample contains yearly data for a period of six years from 2010 to 2015, a time span that would allow for a three-year window before and after the quota implementation on January 1, 2013. When downloading the data, financial and insurance companies were excluded as to avoid biases due to economic effects, and to avoid misinterpreting leverage levels since these tend to have a different meaning for financial than for non-financial firms. The sample consists of 92 companies, however not all of them provide data for the entire sample period. For this reason, firms with less than four years of data were dropped. This benchmark was set up because the firms in the sample should all have experienced the quota implementation as to understand its effects. Additionally, companies that by law were not required to implement the quota were also dropped. As stated previously, this means that they did not adhere to at least two of the following

[1]This thesis would originally include France, Norway and Spain to the sample, including approximately 1500 companies. However, due to the shortage of data access to the Orbis database, filling the board composition information gap was not feasible for a sample that large.

three requirements to apply the quota: the firm has more than 250 employees, 35 million euros in turnover or 17.5 million euros in total assets. When filtering all this data out, the final sample consists of 70 Dutch firms and 414 observations.

These firms are categorized into sectors. The Orbis database splits these up into 11 Bureau van Dijk major sectors. Due to the small number of companies however, some of these sectors consist of only one or two firms. For this reason, they have been sub-categorized into five sectors defined as: 1. communications; 2. food, beverages, tobacco and retail; 3. machinery, equipment, furniture and recycling; 4. other services; 5. primary sector. With the reduction of the number of sectors, changes over time will be more evident.

Finally, monthly stock data was gathered to understand whether two specific dates affected the stock prices of these firms. These dates are the announcement date on June 6, 2011 and the implementation date on January 1, 2013. The time span of the stock price is also six years, however specific focus will lay around these two dates.

3.2 Measures

The effect of the gender quota on firm financial performance is the essence of this investigation. The independent variable is therefore firm financial performance, which can be measured in two ways: through financial accounting data and stock-market based data. Although financial accounting is a widely-used measure of performance, it will not be used as the main performance criterion due to possible differences in accounting standards between companies. In order to avoid this, Tobin's q is used; a stock-market based measure. This measure is used extensively by researchers as it serves as a proxy for firm performance. Amongst other researchers, Aidar Sauaia and Figueiredo Castro [2002] claim that it is a good proxy for financial performance as it measures future tendencies, allowing for insight on whether a company is likely to invest in innovations and thus invest in growth opportunities. If Tobin's q is greater than one, the firm's market value is greater than the value of the company's recorded assets. These values thus encourage companies to invest more in capital, as they are worth more than the price paid for the assets. If it is between zero and one however, its market value is lower than the value of the recorded assets, discouraging investments in capital. Therefore, when using this measure, a firm has better financial performance, as well as future performance when Tobin's q is high. Equation 3.1 indicates how firm performance is measured.

$$Tobin's\, q = \frac{Total\, Market\, Value\, of\, the\, Firm}{Total\, Assets\, of\, the\, Firm} \tag{3.1}$$

This study will analyse the quota effect, as such diversity of boards is inves-

tigated. Hence, the independent variables that are used for this study are gender board diversity and two binary dummies: the *Quota dummy* for companies that have achieved the quota in any given year and the *Female dummy* for companies that have hired at least one woman into their board. The gender board diversity is calculated in percentages as depicted in equation 3.2, while the Quota dummy variable is listed as 1 for firms that have implemented at least a 30% equal gender representation in their board of directors and 0 otherwise. The Female dummy will take the form of 1 if the company has at last one woman in their board of directors and 0 otherwise. Additionally, firms that have implemented the quota successfully will be compared to those that have no women in their boards, which continues to occur due to the 'comply or explain' policy.

$$Gender\,Board\,Diversity = \frac{Number\,of\,Women\,in\,the\,Board}{Total\,Number\,of\,Members\,in\,the\,Board} \cdot 100 \quad (3.2)$$

Control variables will be used to control for the possibility that firm financial performance or board compositions change due to external factors. These variables include board size, firm size (calculated as the natural logarithm of total assets), industry and other performance measures such as the Return on Equity (ROE), Return on Assets (ROA) and Earnings per Share (EPS). The former control variables could affect the likelihood of women being hired, as for example the number of women employed in a certain sector may affect the number of women in their top management. An additional reason is to correct for the number of available positions at the time. The accounting data measures are included with a one-year lag, as accounting data for a specific year is reported in the next year. Additional to a simple Ordinary Least Squares (OLS) regression, robust firm fixed effect will be conducted to account for time-invariant firm characteristics. Having conducted the Hausman test, it is additionally evident that the fixed effects model should be used.

3.3 Empirical Methodology

The research will be conducted by means of an OLS regression that determines the relationship between firm financial performance and the gender quota implementation in Dutch firms. The following equations show the OLS regressions that will be estimated throughout this paper.

$$Tobin's\,q_{i,t} = \beta_0 + \beta_1 Gender\,Board\,Diversity_{i,t} + \Sigma_{j=1}^{N} vjxX_{i,t} + \epsilon_{i,t} \quad (3.3)$$

$$Tobin's\,q_{i,t} = \beta_0 + \beta_1 Female\,dummy_{i,t} + \beta_2 Quota\,dummy_{i,t} + \Sigma_{j=1}^{N} vjxX_{i,t} + \epsilon_{i,t} \quad (3.4)$$

$$Tobin's\, q_{i,t} = \beta_0 + \beta_1 Gender\ Board\ Diversity_{i,t} + \beta_2 Quota\ dummy_{i,t} + \Sigma_{j=1}^{N} vjx X_{i,t} + \epsilon_{i,t} \tag{3.5}$$

These equations describe the effects of several independent variables on the dependent variable of firm financial performance. Equation 3.3 estimates the effect gender diversity of boards has on Tobin's q, where diversity is defined by equation 3.2. The vector of control variables is represented by $\Sigma_{j=1}^{N} vjx X_{i,t}$ for every firm. Furthermore, the β_0 is the constant and $\epsilon_{i,t}$ the error term. This is to support the research for testing the first hypothesis. In answering hypothesis two, equation 3.4 will be used. Here, two dummy variables are used as the independent variables, mainly the Female and the Quota dummy. The control variables used are as in Equation 3.3. Finally, equation 3.5 aims at responding the third hypothesis on firm financial performance, by integrating equations 3.3 and 3.4. Here the dependent variables are gender diversity of boards and the Quota dummy.

3.4 Descriptive Statistics

The compositions of Dutch supervisory boards have changed drastically over the past years. Figure 3.1 shows the transition of board compositions from 2010 to 2015, splitting the sample up into three categories: firms with zero women in their supervisory board, firms that have achieved the quota and thus have at least a 30% equal representation of gender, and finally, companies that are between 0 and 30% represented by women. In 2010, the majority of firms had no women on

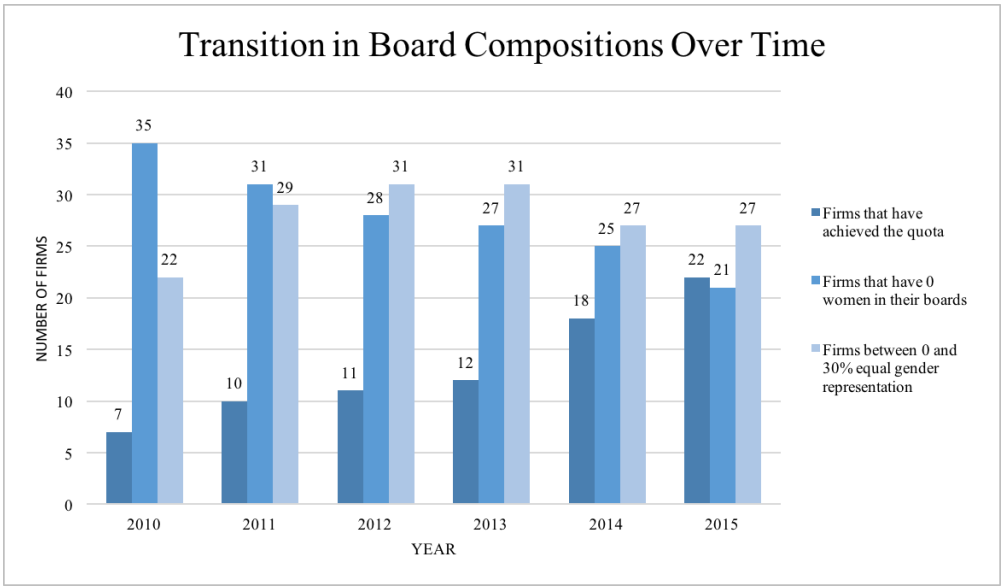

Figure 3.1: Transitions in board composition of Dutch companies from 2010 to 2015

their boards, representing 55% of the sample. Over time this group has reduced, dropping to a 30% of firms by 2015. Additionally, the number of companies that have successfully implemented the quota minimum has gradually been increasing,

showing a faster growth in the years 2013 to 2015, after the law was enforced. This changed from an 11% in 2010 to 17% in 2013 and finally a 31% in 2015.

Although this outcome was not what the Dutch government had hoped for, it is an improvement in gender imbalances of boards. Compared to countries such as Norway and France however, where the law puts a sanction on businesses that do not adhere to the legislation, the Dutch underperformed in their ability to attain gender parity of boards, with many companies that still do not employ women in the boards.

This positive trend is less evident in Tobin's q averages over the same period. Figure 3.2 provides data on four categories of Tobin's q over the period between 2010 and 2015, mainly: the average over all companies, corporations with no women in their supervisory boards, firms with a female representation of between 0 and 30% and firms with a gender parity in their boards of 30% or more. The average of all companies illustrates that in the years prior to the law enforcement, Tobin's q dropped from 0.9 to approximately 0.75. However, upon the implementation of the quota, this performance measure improved, surpassing the initial value in 2010 in the preceding years. But how does this finding compare to each category of firms per level of implementation?

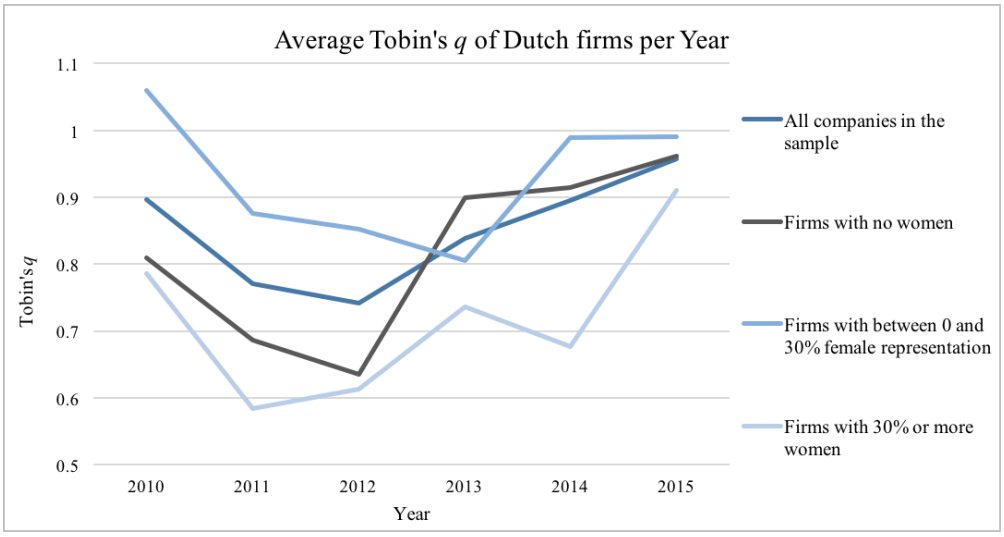

Figure 3.2: Tobin's q for Dutch companies from 2010-2015

Throughout the sample period, companies that have women in their boards, but do not reach the quota benchmark perform the best. In the first four years, there is a decreasing trend in their performance, however, between 2013 and 2014 there is a sharp improvement which then stabilizes in 2015. Contrastingly, firms that have implemented the quota perform the worst compared to the rest of the categories. Finally, companies that do not have any women in their supervisory boards show a similar transition to firms that achieved the quota benchmark. However it experiences a larger increase in Tobin's q from 2012 to 2013, stabilizing

thereafter.

Although from this data we cannot determine that this improvement in the financial performance measure is due to the implementation of the quota itself, we do find that since the enforcement, firms in all categories have generally improved their performances. The drop in performance between 2010 and 2012 may have been due to several reasons, including the hit of the economic crisis.

Table 3.1 illustrates the averages and standard deviations of all the variables in question and their correlations. It demonstrates that between the years 2010 and 2015, on average 19.3% of firms successfully implemented the quota, far below the government's expectations. The very high standard deviation value of market capitalization can be explained by the large differences in size between companies, a factor which is corrected for in the regressions by controlling for firm size. Furthermore, it states that despite this, only 14.2% of boards consist of women over the whole sample period. This adds to the data provided above that many firms still employ zero women. Additionally, the correlation matrix suggests that the size of a supervisory board, represented by the number of directors, is positively correlated to the number of women employed, and as such also to the share of women in boards. Thus the larger the board, the larger the probability that women will be present in that board. Additionally, this matrix illustrates the negative and statistically significant correlation between a company's size and its performance.

Stock prices also show the patterns in performance of firms and thus when an event affects a firm, it may be found in its stock prices. This thesis puts attention to the changes in stock prices around two key event dates; the date of the announcement of the quota in the Netherlands on June 6, 2011, and the date of the implementation on January 1, 2013. Figure 3.3 provides normalized average monthly stock data of Dutch firms and it presents the four different categories, similarly to figures 3.1 and 3.2. Between April and June 2011, the average stock prices of all categories decreased, before increasing again slightly. In the event of the announcement date this increase continued until mid-June. In the event of the implementation date, a similar trend occurred. In December 2012, the stock prices dropping sharply, continuing to drop until the end of January, after which the stock price grew and balanced out. Although this is not conclusive, there was a drop in the stock prices of firms in each category during the period close to the announcement and implementation dates.

Table 3.1: Summary Statistics and Correlation Matrix

Variable	Mean	Standard Deviation	1	2	3	4	5	6	7	8	9	10
1. Tobin's q	0.984	0.961	1.00									
2. Gender Board Diversity	0.142	0.141	0.04	1.00								
3. Quota achieved (dummy)	0.193	0.395	0.01	0.62***	1.00							
4. Boards with Women (dummy)	0.597	0.491	0.01	0.89***	0.40***	1.00						
5. Number of Directors	5.520	2.395	0.04	0.40***	0.15***	0.49***	1.00					
6. ROE	10.312	20.243	0.41***	0.09*	0.06	0.06	0.18***	1.00				
7. ROA	5.127	9.468	0.56***	0.12**	0.10**	0.09*	0.21***	0.85***	1.00			
8. Size	13.763	2.523	-0.22***	0.25***	0.06	0.33***	0.70***	0.15***	0.11**	1.00		
9. EPS	1.014	3.362	0.06	0.02	-0.05	-0.01	0.11**	0.24***	0.21***	0.14***	1.00	
10. Market Capitalization (in millions)	4923.0	10929.4	0.14***	0.31***	0.16***	0.28***	0.64***	0.27***	0.20***	0.53***	0.18***	1.00

***Indicates statistical significance at the 1% level
**Indicates statistical significance at the 5% level
*Indicates statistical significance at the 10% level

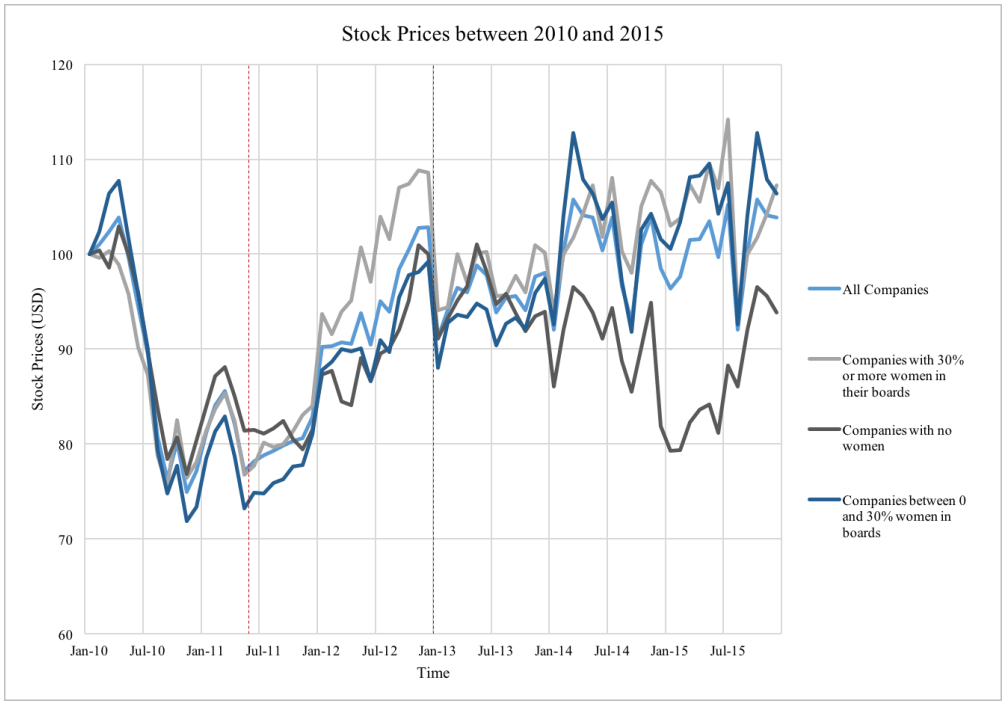

Figure 3.3: Normalized stock prices of Dutch firms from 2010-2015. The two important dates in this figure are June 6, 2011 and January 1, 2013, represented by the vertical dotted lines. The former date is the day in which the Dutch Government made an adjustment to their Civil Code to include articles 2:166 and 2:276 stating that companies that adhere to the quota requirements as stated in article 2:397:1, must have a supervisory board consisting of at least 30% equal gender representation with a deadline of implementation on January 1, 2016, the same day that these articles expired. This legislation was implemented on January 1, 2013 [Dutch Government, 2011, Raad voor de Jaarverslaggeving, 2013].

Additionally, it can be observed that on average, companies that by 2015 have still not appointed any women in their supervisory boards have the lowest stock prices, while firms with between 0 and 30% of women in their boards have the highest stock prices. Despite these differences, the averages show that their patterns are similar, experiencing similar fluctuations in their stock prices.

Finally, the trends in sectors illustrate how firm performance has evolved over time for every sector. Figure 3.4 show that financial performance does differ for every sector. Sector 5 for example, the Primary Sector, performs the worst in all six years, and shows little change throughout time. Furthermore, in sectors 2, 3 and 4, which are respectively the food, beverages, tobacco and retail sector; the machinery, equipment, furniture and recycling sector; and other services, they tend to improve with time, showing higher Tobin's q values in the last three years compared to the first three. Sector 1 shows most fluctuation in performance over time, representing the communications sector, peaking in 2013 with a Tobin's q of 2. This is likely due to several companies that peaked in this year, the other years however we see a negative trend, unlike in sectors 2, 3 and 4; in 2010

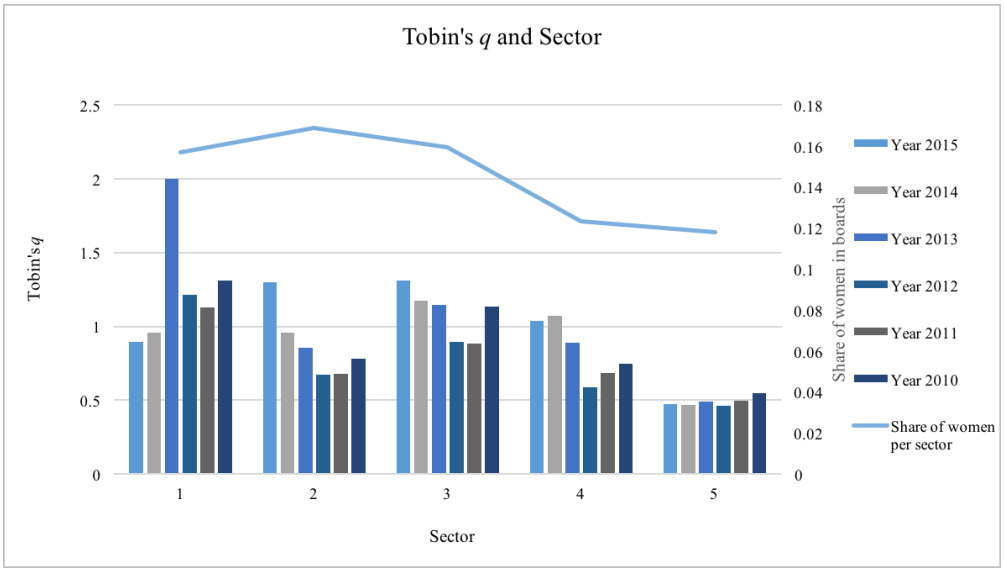

Figure 3.4: Levels of Tobin's q and the share of women in boards per sector over the period 2010-2015

they performed better than they did in 2015. Additionally, this graph provides information on the share of women in the boards of companies per sector. This demonstrates that sectors 1, 2 and 3 have a higher percentage of women in their boards than sectors 4 and 5. Although we cannot conclude anything from these findings, the sectors in which the percentage of women in the boards is highest, are also the sectors with the highest Tobin's q values. This implies that sectors may also influence whether a woman will be elected into a supervisory board position or not.

4 Empirical Results

In order to investigate the research question and prove the hypotheses, regression and data analyses were conducted. This section will provide and analyse the results obtained throughout this research to shed light on whether women in boards and gender quotas on supervisory boards affect a firm's financial performance.

4.1 Gender Diversity in Boards

Table 4.1 provides regression output, with firm financial performance as the independent variable, by analysing the impact of gender diversity in boards on firm performance. The table is divided into two subsections: the robust regression and the firm fixed effects regression. This differentiation is made to better interpret the significance of the results. Columns 1 to 3 represent the regression outputs of a robust analysis, while 4 to 6 represent that of a fixed effects analysis.

Columns 1 and 4 identify the relation between the control variables and the independent variable. A company's size, as measured by the natural logarithm of total assets, has a negative effect in both regressions. In the fixed effect model, however, the negative effect is larger and significant to the 1% level, implying that a one unit increase in a company's size decreases the Tobin's q by 0.5. In this model, ROA and EPS also significantly affect performance, although positively. The remaining control variables have little significance, where the size of the board is inconclusive in its effects on performance.

Furthermore, columns 2 and 5 provide regression results of the dependent variable as illustrated in equation 3.3, where both models, though insignificant, show that when the share of women in boards of directors increases, their performance improves. When comparing the aforementioned results to the regression including both the dependent and the control variables, the data changes slightly as depicted in columns 3 and 6. Firstly, the fraction of women in boards has a slightly more positive influence on firm performance, although insignificantly, implying that when there is a higher share of women, Tobin's q increases. Furthermore, the number of members in the boards, and ROE continue to be insignificant. Firm size has not changed from the previous model, still negatively affecting performance, as was previously illustrated in the correlation matrix of table 3.1.

The adjusted R^2 is higher in the fixed effects model than the robust model. Within the fixed effects model, the R^2 was the same for the model with only control variables and the model including the dependent variable as well. This renders better performance for the fixed effects model than the robust model. From the provided analyses, we conclude that the first hypothesis on gender diversity positively affecting Tobin's q is true, as we find that in all the models, the share of women in boards does benefit performance. However, due to the lack of quality

Table 4.1: Tobin's q and the Share of Women in Boards

Robust refers to the robust regression, in order to be sensitive to the violation of assumptions made by the data-generating process, as such also correcting for possible outliers. In turn, the fixed effects model imposes time-independent effects for each company that may be correlated with the regressor. When analysing both models, we can best infer what model is most suitable for our regression analysis.

Effect of women in boards on a company's financial performance

	Robust			Fixed Effects		
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Women in Boards		0.255	0.333		0.1619	0.227
		(0.341)	(0.237)		(0.418)	(0.243)
Size of Board	0.55**		0.046	-0.007		-0.002
	(0.027)		(0.029)	(0.024)		(0.024)
Size of Firm	-0.042*		-0.039	-0.500***		-0.497***
	(0.024)		(0.025)	(0.079)		(0.079)
ROE	-0.014**		-0.014**	-0.002		-0.002
	(0.006)		(0.006)	(0.003)		(0.003)
ROA	0.075***		0.075***	0.011*		0.011*
	(0.018)		(0.018)	(0.006)		(0.006)
EPS	0.017		0.018	0.014*		0.014*
	(0.013)		(0.014)	(0.007)		(0.007)
Constant	0.877***	0.885***	0.835**	7.85***	0.898***	7.782***
	(0.257)	(0.074)	(0.265)	(1.113)	(0.418)	(1.113)
Adjusted R^2	0.387	0.001	0.39	0.825	0.565	0.825
Observations	337	370	337	337	370	337

***Indicates statistical significance at the 1% level
**Indicates statistical significance at the 5% level
*Indicates statistical significance at the 10% level

data, this finding is considered statistically insignificant.

4.2 Board Compositions – The Two Extremes

To explore the second hypothesis on firm performance, adopting the two extreme situations of board compositions, we use two dummy variables, which represents the two utmost situations. These refer to firms that do not employ any women in their boards, and those that employ 30% or more of either gender. As in the previous table, table 4.2 are separated into two models, where columns 1 to 3 represent the robust model, and 4 to 6 the fixed effects model. Columns 1 and 4 regress the *Women dummy* variable, which takes the form of 1 if firms employ 1 or more women in their supervisory board, and 0 otherwise. In both models, the dummy has a positive impact on Tobin's q, suggesting that compared to companies with no women in their boards, firms that do employ women perform better financially. According to the fixed effects model, companies with a female representative in their board have a Tobin's q that is 0.10 points higher than for boards without women. In the robust model this difference is smaller. Although

firms with women in their boards perform better, their results are insignificant for both models, despite the high R^2 value of 0.83 in the fixed effects model. These results thus conclude that firms with women in their supervisory boards perform better than those without them. However, is this also the case for firms that employ a 'diversified' number of women compared to only a few women?

By regressing the *Quota dummy*, taking the value of 1 if the board consists of 30% or more of both genders and 0 otherwise, the effect it has on Tobin's q is analysed. These results are found in columns 2 and 5 of table 4.2. This regression shows that firms with more than 30% of gender parity perform slightly worse than those with less women. The coefficients are -0.006 and -0.03 respectively. In essence, these values imply that firms with less than 30% of equal gender representation perform better than those with a higher percentage. However, both models show that these findings are very small and insignificant, therefore it cannot be assumed that the firms having achieved the quota underperform compared to their counterparts.

Table 4.2: Tobin's q and the Two Extremes

Effect of no women in boards and 30% or more women on a companys financial performance

	Robust			Fixed Effects		
	(1)	(2)	(3)	(4)	(5)	(6)
Women dummy	0.072		0.080	0.102		0.114
	(0.068)		(0.073)	(0.077)		(0.079)
Quota dummy		-0.006	-0.036		-0.026	-0.050
		(0.125)	(0.133)		(0.072)	(0.073)
Size of Board	0.047	0.55**	0.048	-0.007	-0.001	-0.008
	(0.029)	(0.028)	(0.029)	(0.024)	(0.024)	(0.024)
Size of Firm	-0.041*	-0.042*	-0.042*	-0.495***	-0.499***	-0.492***
	(0.024)	(0.025)	(0.025)	(0.079)	(0.079)	(0.079)
ROE	-0.014**	-0.014**	-0.014**	-0.002	-0.002	-0.002
	(0.006)	(0.0.006)	(0.006)	(0.003)	(0.003)	(0.003)
ROA	0.075***	0.075***	0.075***	0.011*	0.012*	0.011*
	(0.018)	(0.018)	(0.018)	(0.006)	(0.006)	(0.006)
EPS	0.018	0.017	0.018	0.014*	0.014*	0.013*
	(0.014)	(0.013)	(0.014)	(0.007)	(0.007)	(0.007)
Constant	0.858***	0.878***	0.866***	7.752***	7.835***	7.710***
	(0.260)	(0.268)	(0.268)	(1.112)	(1.113)	(1.114)
Adjusted R^2	0.388	0.387	0.388	0.825	0.824	0.825
Observations	337	337	337	337	337	337

***Indicates statistical significance at the 1% level
**Indicates statistical significance at the 5% level
*Indicates statistical significance at the 10% level

Finally, the two dummy variables have been integrated into one same regression, given in columns 3 and 6, rendering similar regression outputs as before. When combining the two variables as illustrated in equation 3.4, the dependent

variables continue to be insignificant, rendering only the size of the firm, ROA, EPS and the constant as statistically significant. From these results, we can therefore conclude that, although insignificantly, women in boards do improve performance while employing a 'diversified' board does not. Additionally, figure 4.1 shows that in each year, firms that have employed the quota into their board composition have underperformed compared to companies without women in their boards. In years 2013 and 2014, this difference is especially evident. Despite these findings, it is not proven that this relation is causal.

Figure 4.1: Tobin's q of the two extremes over the period 2010-2015

4.3 Gender Quota and Firm Financial Performance

The final hypothesis is analysed with the regression as expressed in equation 3.5, using the Quota dummy and board diversity as the dependent variables. Table 4.3 provides the regression outputs of the robust and fixed effects models. The fixed effects model provides the higher significant values, however the dependent variables continue to be statistically insignificant. Size and the constant are the only significant values in the regression. As discussed previously, table 4.1 columns 3 and 6, and table 4.2 columns 2 and 5 provide the regression outputs of the dependent variables in question individually, where the former finds that the coefficient of the share of women is positive and statistically insignificant. The latter regresses the Quota dummy, here in turn resulting in a negative statistically insignificant effect on Tobin's q.

When combining these variables into one regression, their coefficients remain similar in both direction and significance. With every unit increase in the share of women on boards, performance improved by 0.5. Contrastingly, companies that have less than 30% of female representation in top management perform 0.13 times

Table 4.3: Gender Quota and Firm Financial Performance

Effect of women in boards and the Quota dummy on a company's financial performance

	Robust	Fixed Effects
Share of Women	0.552 (0.347)	0.515 (0.325)
Quota Dummy	-0.14 (0.1724)	-0.128 (0.096)
Size of Board	0.044 (0.029)	-0.004 (0.024)
Size of Firm	-0.041 (0.025)	-0.487*** (0.079)
ROE	-0.014** (0.006)	-0.002 (0.003)
ROA	0.075*** (0.018)	0.011* (0.006)
EPS	0.018 (0.138)	0.013* (0.007)
Constant	0.848** (0.266)	7.619*** (1.118)
Adjusted R^2	0.392	0.825
Observations	337	337

***Indicates statistical significance at the 1% level
**Indicates statistical significance at the 5% level
*Indicates statistical significance at the 10% level

better than those that have applied the quota.

The third hypothesis predicted the opposite to occur in the results. Instead of having better performance in companies that have achieved the quota, they underperformed compared to their counterparts. Despite this result, the share of women on boards does imply that companies with women perform better than those without them. However, because of the lack of quality data, the differences are not statistically significant.

5 Limitations and Future Research

This paper has aimed at filling the gap in available literature and research about gender quotas. In doing so, multiple regressions have been used to understand the effects of women and gender quotas on a firm's financial performance. This research however, faces limitations in its process. This section will bring these limitations to light, and will provide implications for future research on this topic

5.1 Sample

Throughout this investigation, the sample was adjusted. In doing so, both its size, and time implications were affected.

5.1.1 Sample Size

For future work, panel data on multiple European countries would increase the number of observations and thus making it easier to estimate the differences in Tobin's q more precisely. This study initially aimed at including public firms of four European countries, mainly France, Norway, Spain and the Netherlands. Allowing for a large number of companies in the sample. However, due to our accessibility of the Orbis database, this was not feasible. Having a larger sample would be beneficial as trend identification becomes easier and usually more significant.

5.1.2 Time

The data gathered on the Netherlands, consists of six years, where three years are before the implementation of the quota, and three after it. When analysing all four countries, with different implementation dates, it would have been feasible to analyse the 'after effect' more precisely. This refers to how companies perform after they have had time to fully integrate their new governance systems. This in turn could have been compared to Dutch performance. In not doing so however, this paper only analysed the effect of the quota during the implementation period. Although changes were seen throughout this transition period, another dimension would have been added to this research had it included post-quota findings.

Since gender equality is a human rights issue that is still increasing in interest throughout European institutions, governments and citizens, it is to be expected that quotas, as well as other actions to improve gender inequality, will continue to be implemented. For future research, it is thus important to understand what the Dutch quota has meant for firms, and how the no-sanction based quota has impacted gender equality of corporate boards, and how the compositions of boards have changed after the quota-period ended.

5.1.3 Board Characteristics

This research focuses on two board characteristics; gender diversity and board size. However, there are more characteristics that affect the performance of boards.

These include the experience of members, age, nationality, education and the year a member first got elected into the board. All these characteristics could affect whether the composition of a board can adequately work together in providing the best results for the firm. Future research on the Dutch gender quota should thus include these characteristics in their regressions, as to understand the broader effect of changes in performance when there are changes in boards.

5.2 Types of Gender Quotas Throughout Europe

Although many European countries have implemented a gender quota on supervisory boards, not all have done it under the same conditions. The most significant difference between countries is their sanction-level, and as such it is of importance to understand the effect these different quotas can have on both the performance of firms, and the reduction of gender inequality. Although worldwide research has been conducted on female involvement and firm performance by multiple researchers including Noland, Moran and Kotschwar [2016], there is very little research on transcontinental gender quotas. This line of research would bring light to the impact of quotas throughout countries and could provide information to institutions such as the European Union, on whether a union-wide quota would be beneficial, both in terms of firm financial performance and human rights issues.

Additionally, the quota this paper has analysed is different from other European quotas as it was one of a temporary nature. Today, it is no longer listed in the Dutch Civil Code and as such, Dutch firms no longer need to adhere to this 30% equal gender representation. This is also an aspect of the legislation worth investigating, as companies that decided not to change their board compositions may have done so due to the nature of this quota: without sanctions and with an expiration date of January 1, 2016. Future research, could investigate this by interviewing companies with no women in their boards.

5.3 Causality

The results found in this research suggest that women have a positive relation to firm performance, while the quota itself does not. Although these findings are statistically insignificant, it is also difficult to prove their causal relationship. This is a research limitation as a company performing better may cause for changes in the board of directors, therefore employing more women. It is therefore not evident whether the performance of a company changes based on board compositions, or that the configuration of the board changes when the company performs better or worse.

6 Conclusions

This paper on corporate governance and the human rights issue of gender equality, has aimed at reducing the gap in current literature about the effects of imposing a quota on the financial performance of corporations, in order to reduce the inequality problem in top management positions. Previous research has concentrated primarily on the influence of women in boards, without focusing on the impact of a quota. Since countries around Europe began introducing quotas over the past 15 years, this topic has become more relevant in understanding the consequences of adopting policies to improve gender equality.

In this research, I find that when there are women in supervisory boards of companies, their financial performance is better than when they are absent. Contrastingly, a quota does not benefit a firm's performance. Despite these findings, however, the results were insignificant. From this, it can be concluded that on the mere principal of women in boards, firm performance is not jeopardized.

While encouraging future research on this topic, this thesis brings to question whether a government should implement a quota. It is evident from past behaviour that companies and governance structures are not eager to change, and as such, breaking the glass ceiling is difficult and unlikely to happen on its own. This research finds that the changes on firm performance when employing women are insignificant. Introducing quotas can therefore have little influence on the performance of a company, while reducing the gender inequality by breaking that glass ceiling.

In the Netherlands, tackling the United Nations Sustainable Development Goal number 5 of gender equality, has not been successful compared to other countries such as Norway and France. Their policy of a 'no-sanction' legislation, has permitted companies to continue their governance as before, thus discouraging change for many firms. Although this research has shown that there are more companies with women in their boards today compared to 5 years ago, approximately 30% of firms that should have complied with the Dutch Civil Code legislation, continue to have no women in their boards.

Through this paper, I hope to encourage future research to further investigate this issue and in analysing the effects throughout multiple European countries, decide whether a European Union-wide legislation on gender parity of top management positions, can be favourable economically, financially and to tackle gender inequality.

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