

Bachelor Thesis

The relationship between gender quotas in board of
directors and firm performance:
Does a gender quota increase firm performance?



Author: Jan Willem de Coo
ANR: S670565

Study: IBA
Department: Finance

Supervisor: P. Tuijp
Final version: July 6, 2012



Table of contents

Table of contents	2
1. Introduction	3
2. Prior research	5
3. Data and methods	7
4. Results and interpretation	9
5. Conclusion	13
Literature references	14
Appendix	16

1. Introduction

Problems of inequality are centuries old. Probably the eldest is the discussion about the equality between men and women. In Norway this discussion has led to a public discussion on the question whether boards of directors should have a minimal percentage of women. This resulted in the adoption of a ground-breaking law that prescribes that at least a forty percent of a board of directors of listed Norwegian companies should be a woman (GovernanceMetrics International, 2011): the so-called gender quota. Since Norway has adopted this law in 2004, many other countries are starting to implement comparable laws. But do these gender quotas have an effect on the firm performance of companies? Or in other words, do governments, implementing such quota, not impede with the choices companies make in the best interest of the firm?

This paper tries to investigate whether there is a relationship between a gender quota and firm performance. Research by Adams and Ferreira (2009) has shown that for US firms the average effect on firm performance by greater gender diversity is negative. Besides that, if a gender quota does exist, companies may be forced to appoint less suitable candidates in their board to meet the requirements of that quota. Therefore the hypothesis of this study suggests that if a country adopts a gender quota it will have a negative outcome for its companies. The resulting problem statement is:

Does the implementation of a gender quota for boards of directors have a negative effect on firm performance?

The answer to this question will be given by researching three research questions, which are formulated to give a detailed explanation as well as increasing understanding of the problems at hand. Furthermore, these will provide evidence whether the hypothesis are supported.

First, *what general consensus can be found in literature about gender quotas and firm performance?* The first part of this paper will cover the most important and recent literature on the subject, which will provide a first insight into the problem.

Second, *how can firm performance be measured and tested against the implementation of a gender quota?* The second part of this paper will cover the techniques to be used for investigating the relationship between a gender quota and firm performance.

Third, *has the implementation of a gender quota for boards of directors by government law got a negative outcome on firm performance?* The last part of this paper will answer the problem statement. It covers the difference between countries with and without a gender quota and will give a conclusion and some recommendations for further research.

This research tries to investigate the relation between a gender quota and firm performance. Therefore it uses data from Norwegian listed companies and will compare these with Danish listed companies. These countries are much alike as they share certain characteristics: Denmark and Norway are Scandinavian countries, which have similar economic outlooks and also are about the same size. The most interesting difference between the two, that is useful in this research is that Denmark has on average a lower percentage of women on the board in comparison to Norway

2. Prior research

A lot of research has been dedicated to the relationship between board composition and firm performance. This part of the paper will go deeper into earlier important studies on this subject.

Board functioning is highly related to organizational performance (Zahra and Pearce, 1989). This leads to the importance of the need for knowledge about the impact of a gender quota in a firm's board of directors. When the outcomes of such a quota are negative, the implementation of it by the government should be reconsidered.

Erhardt, Werbel and Shrader (2003) and Carter, Simkins and Simson (2003) showed that diversity in board of directors appear to have an impact on firm performance. Further, Konrad, Kramer and Erkut (2008) found that the impact of women on a board is bigger when there is more than one woman present on that board. In these cases, women feel stronger together and as such can have a stronger voice in the decision-making process. This implies that they will also feel more valued. However, these studies do provide solid evidence that it is better for the firm performance to have women on the board. Other research, by Smith, Smith and Verner (2005) showed that board diversity, in a study of 2500 Danish firms, has positive effects on firm performance. Though, these positive performance effects are mainly related to female directors with a university degree. Shrader et al. (1997) found a positive relation between women on boards and management positions and firm performance. Nevertheless, the study argues that this relation is positively influenced by the kind of companies they have investigated. The investigated firms are so renowned that they subsequently could recruit more qualified people, which resulted that they perform relatively better than average in the US.

In similar research, which focused mainly on outside directors, Farrell and Hersch (2005) and Hermalin and Weisbach (1988) found that firm performance is positively related to the likelihood of adding an independent female outsider to the board and negatively related to adding an independent male outsider. Farrell and Hersch (2005) also argue that

women are expected to seek employment at better performing and lower risk firms. This can influence the research about the relationship between women in the board and firm performance, because this assumes that female board members are likely to be found in well performing firms.

Furthermore, Adams and Ferreira (2009) showed that the average effect of greater gender diversity in the US is negative. So the research on gender diversity in boards of directors has led to very ambiguous results so far. This follows from the difficulty in measuring firm performance due to the many factors that influences it. However, the results of their research show that female directors have a substantial and value-relevant impact on board structure. Though, there is no conclusive evidence that provide support that gender quota implementations will improve firm performance on average. Probably, improvements in governance of board of directors will explain this increase more accurately than gender quotas.

3. Data and methods

The studies in the previous section use a range of characteristics to test the influence by the percentage of women on the board on the firm performance. In this study we test the influence of a gender quota on the firm performance.

To measure the impact of a gender quota on firm performance, this study compares listed companies of Denmark and Norway. The most influential securities, which are most traded at their local stock exchanges will be considered. In Norway these stocks are listed on the OBX and in Denmark on the OMX Copenhagen. On the one hand, the companies of the OBX have a gender quota, which implies that the percentage of women in their board of directors should be at least 40%, as is mandated by the aforementioned Norwegian law. On the other hand, the companies listed on the OMX Copenhagen do not have such a quota. All the data used for this study are gathered from the annual financial reports of these companies. This research returned a list of 45 companies, 25 Norwegian and 20 Danish. To ensure an accurate comparison the financial data were measured in the same currency, namely US Dollars.

Dependent variable

The dependent variable is firm performance. There are several methods to operationalize this, but this study uses Return on Assets, which is a common method to measure firm performance. Among others, Erhardt, Werbel and Shrader (2003); Shrader, Blackburn and Iles (1997) and Adams and Ferreira (2009) used this measure. The ROA is calculated by the Net Income divided by the Total Assets.

Independent variable

The independent variable is the gender quota. The gender quota is operationalized by a dummy variable, which takes value 1 if the company is Norwegian and 0 if the company is Danish.

Control variables

The study uses several control variables that have also an effect on the dependent variable: the fraction of women on the board, the firm size and industry effects.

The fraction of women on the board is calculated by the board size divided by the number of women that are on that board. To improve results it is checked whether there are no double functions: there are no women in the sample that have a seat in boards of more than one company in the sample. The more women on the board, the more their impact is on the firm performance, according to Konrad, Kramer and Erkut (2008).

Performance is expected to be positively related to firm size, because large firms normally have more market power, Bain (1951). The firm size is operationalized by the number of employees of the firm.

According to Hoskisson and Hitt (1990), the industry a company operates in may provide incentives to change its percentage of women on the board. The company's are categorized by their SIC codes and grouped by categories, see Appendix 1. Based on these categories, the companies are assigned industry dummies. The manufacturing sector is considered the base level, since most of the companies belong to this sector.

Empirical model

The hypotheses of this research will be put to the test by exploring descriptive statistics, as well as performing t-tests and a regression analysis. The descriptive statistics will provide a first insight, the t-test will show whether there are differences between the country with and the country without the gender quota, and the regression analysis will provide an insight of the significance of the model and the interaction of the variables.

The model used in this paper is:

$$\text{firm performance} = \beta_1 + \beta_2 \text{ gender quota} + \beta_3 \text{ fraction of women on board} + \beta_4 \text{ firm size} + \beta_5 \text{ industry sector}$$

4. Results and interpretation

This chapter will give an overview of the statistical analysis of the data. First of all, the descriptives, to be found in Table 1, show that there are on average around 20 percent more women in Norwegian boards than in Danish boards. This implies that the law enforcing gender quota is effective. Although, it is even more remarkable that at the end of 2011 on average the biggest Norwegian companies have still not met the requirements of the quota. Another notable fact is that the average firm size of the Danish companies is more than twice the Norwegian companies. These findings on the firm size and value support the hypothesis of Bain (1951): performance is expected to be positively related to firm size, because large firms normally have more market power.

TABLE 1	Descriptive statistics			
	Country	Mean	Std. Deviation	Std. Error Mean
Board	0	9,95	2,645	0,591
	1	8,36	2,675	0,535
Women on board	0	1,75	1,164	0,26
	1	3,16	1,573	0,315
Fraction of women on board	0	0,17855	0,10867	0,02430
	1	0,38287	0,13901	0,02780
Firm size	0	17260,2	25870,495	5784,819
	1	8394,4	10221,922	2044,384
Firm performance	0	0,06493	0,07499	0,01677
	1	0,02723	0,12871	0,02574
Variables				
Country	grouping variable, Denmark = 0, Norway = 1			
Board	total number of directors on the board			
Women on board	number of female directors on the board			
Fraction of women on board	percentage of women on the board			
Firm size	number of employees of the firm			
Firm performance	return on assets of the firm			

Also the correlations matrix, found in Table 2, gives some interesting result. It shows that the relation between the fraction of women on board and the gender quota (country) is both highly significant as fairly correlated. This supports the efficiency of Norway's gender quota. The matrix shows also that both the fraction of women on board as the country are negatively related to the firm performance. This supports the hypothesis of this study, but the relations are not significantly enough to conclude the problem statement is true.

TABLE 2	Correlations matrix (N=45)		
	Firm performance	Country	Fraction of women on board
Country	-0,174		
Fraction of women on board	-0,151	0,635**	
Firm size	0,064	-0,233*	-0,243*
<i>significance</i>			
** = p < .10			
** = p < .001			
<i>variables</i>			
Country	grouping variable, Denmark = 0, Norway = 1		
Fraction of women on board	percentage of women on the board		
Firm size	number of employees of the firm		
Firm performance	return on assets of the firm		

The independent samples t-test, which can be found in Table 3, gives a first insight on the probable output of the regression. The means are compared to the grouping variable 'country'. The test shows that the output of fraction of women on board is fully

significant and that the employees and ROA are less significant. The direction of the fraction of women on board is negative, which should be seen in the regression too.

TABLE 3	Independent samples t-test for equality of means			
	t	Sig.	Mean Difference	Std. Error Difference
Fraction_women	-5,534	0	-0,20432	0,03692
Employees	1,445	0,162	8865,8	6135,441
ROA	1,227	0,227	0,03770	0,03072

Table 4 shows the results of the regression. The dependent variable is the firm performance. The directions of the outcomes are in line with the t-test, although the exact numbers differ. This means that the independent variables behaving in the same line as they do combined in the model. The R-squared is rather low and shows that the variation in firm performance is explained by the model for around 33%. The F-value shows that...

TABLE 4	Regression results
	B (model)
<i>Constant</i>	0,102
Country	-0,068
Fraction_women	-0,023
Employees	7,02E-07
<i>Industry dummies</i>	
D_Agri	0,02
D_Fin	-0,068
D_Min	0,05
D_Serv	0,096
D_TCEGS	-0,113
D_Whole	0,049
R ²	0,326
Adjusted R ²	0,152
F	1,878

5. Conclusion

Results from research about the relationship between firm performance and board of director characteristics are very ambiguous. There is not found a straightforward answer to this relationship yet. Especially in the scope of this study, the relationship between firm performance and a gender quota for the board of directors, there are opportunities for further research. It is clear that a board of directors have an influence on the firm performance (Zahra and Pearce, 1989), but there exists no solid evidence that a gender quota has a negative impact on the performance of the firm. Nevertheless this study gives a good insight and some indications for further research to prove this hypothesis.

This study is limited by the facts that it compared companies from only two countries and in one certain timeframe. To get more robust results, a larger sample of companies from different countries can be used and other performance indicators like Tobin's q can be operationalized. Besides that, further research on this subject can be done by executing a panel analysis on Norwegian companies before and after the introduction of the gender quota. This will give better insights of the impact of such a quota on a certain firm.

Literature references

Adams, R.B. & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of financial economics Vol. 94* (Issue 2), p.291-309.

Bain, J.S. (1951). Relation of profit rate to industry concentration: American manufacturing. *Quarterly Journal of Economics, Vol. 65*, pp. 293-324.

Carter, D.A., Simkins, B.J., and Simpson, W.G. (2003). Corporate Governance, Board Diversity, and Firm performance. *The financial review, Vol. 38* (Issue 1), pages 33–53.

Erhardt, N.L., Werbel, J.D., Shrader, C.B. (2003). Board of Director Diversity and Firm Financial Performance. *Corporate Governance: an international review, Vol. 11* (Issue 2), pp. 102-111.

Farrell, K. A. & Hersch, P.L. (2005). Additions to corporate boards: the effect of gender. *Journal of corporate finance, Vol. 11* (Issues 1-2), pp. 85-106.

GovernanceMetrics International (2011). Women on boards report. Retrieved March 1, 2012, from http://www.calstrs.com/corporategovernance/women_on_boards_2011.pdf.

Hermalin, B.E. & Weisbach, M.S. (1988). The determinants of board composition. *RAND Journal of economics vol. 19*, pp. 589-606.

Hoskisson, R., Hitt, M., Johnson, R., and Moesel, B. (1993). Construct validity of an object (entropy) categorical measure of diversification strategy. *Strategic Management Journal, volume 14*, pp. 215-235.

Konrad, A.M., Kramer, V.W. and Erkut, S. (2008). Critical Mass: The Impact of Three or More Women on Corporate Boards. *Organizational Dynamics*, Vol. 37 (Issue 2), pp. 145-164.

Shrader, C., Blackburn, V. and Iles, P. (1997). Women in management and firm financial performance: an exploratory study. *Journal of Managerial Issues*, Vol. 9, pp. 355-372.

Smith, N., Smith, V., Verner, M. (2005). Do women in top management affect firm performance? A panel study of 2500 Danish firms. *IZA Discussion Paper Series*, Nr. 1708, pp. 1-34.

Zahra, S. & Pearce, J. (1989). Boards of directors and corporate financial performance: a review and integrative model. *Journal of Management*, Vol. 15, pp. 291-344.

Appendix 1

2-digit SIC Code	Industry dummy label categorization
01-09	Agriculture, Forestry & Fishing
10-14	Mining
15-17	Construction
20-39	Manufacturing
40-49	Transportation, Communications, Electric, Gas & Sanitary Services
50-51	Wholesale Trade
52-59	Retail Trade
60-67	Finance, Insurance & Real Estate
70-89	Services
91-99	Public Administration

Source: <http://www.naics.com/search.htm>, retrieved at 06-06-2012

NOTE: This appendix refers to how the industry dummies are categorized. They are based on the code list of the U.S. Securities and Exchange Commission. The first two digits of the 4-digit SIC-code of the company's core operation are used to assign the sub-category.