



**SCHOOL OF ECONOMICS
AND MANAGEMENT**
Lund University

Financial implications of a gender diverse board
– A quantitative study on the Nasdaq OMX Stockholm

Department of Business Administration

BUSN79 – Degree Project in Accounting and Finance

Spring 2019

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Abstract

Title: Financial implications of a gender diverse board - A quantitative study on the Nasdaq OMX Stockholm

Seminar date: 2019-06-05

Course: BUSN79, Business Administration: Degree Project in Accounting and Finance

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Key words: Corporate Governance, Board of Directors, Gender Diversity, Tobin's Q, ROA

Purpose: The purpose of this study is to examine if there is causal evidence on the relationship between gender diversity on the board of directors (measured as the share of females) and financial performance (measured as Tobin's Q). With this study, the authors wish to contribute with conclusiveness in the empirical literature.

Methodology: The authors use a quantitative method with a deductive approach on secondary data. Pooled OLS regressions with fixed effects and robust standard errors on panel data are used.

Theoretical perspective: Agency Theory, Resource Dependence Theory, Stakeholder Theory, Risk Aversion, Corporate Governance Behavior

Empirical foundation: The sample consists of 163 unique firms and 719 firm-year observations between the years 2013-2017. The companies are either large- or mid-cap. The data on financial variables is collected from Bloomberg. The data on corporate governance variables is collected from modular finance holdings.

Conclusion: The study finds no significant relationship between the share of females on the board of directors and Tobin's Q.

Acknowledgement

The authors would like to thank Karin Jonnergård, their supervisor, for her support and guidance during the implementation of this thesis. The authors would also like to thank Carl Holfve at Modular Finance Holdings for his help with corporate governance variables.

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1. Introduction

Gender diversity is a contemporary topic and it is prevailing in the world of business. Generally, women are underrepresented in positions of power and trust. In Sweden, women occupy 33,9 % respectively 23,2 % of the positions on the board of directors and in top management. The share of women in these positions is increasing, as the trend is positive over the past five years. However, this share does not reflect the share of women with higher education, assuming that there is a correlation between the occupancy of a position of trust and higher education. With the same pace, women will be equally represented on the board of directors in 22 years. For top management, the time-frame is 33 years. (Andra AP-fonden, 2018)

The topic of gender diversity can fundamentally be split into two perspectives. The first perspective, which arguably is most salient in the public debate in Sweden, is *ethical*. The narrative conveys that women should not be excluded from positions of power and trust because of their gender. An example of an action taken in regard to this perspective is the gender quota proposed by the European Commission in 2011 that promoted equal opportunities for men and women (EC, 2011). Other examples can be derived from quotas that have been introduced in countries such as Belgium, France and Norway (Ahren & Dittmar, 2012; EC, 2012). Even if no clear consensus is identifiable and it would be reasonable to investigate the relationship from this perspective, it is not the focus of this study.

The other perspective is the business case, which considers females in positions of power and trust and firm performance. This perspective is widely examined in the academic literature and it is partly predicated on the fact that there are differences between males and females in leading positions. Campbell and Minguez-Vera (2009) name this the *business case* for female participation on the board of directors; that companies might fail to select the most competent individuals for positions of trust if women are overlooked. The empirical evidence is ambiguous and there is no consensus regarding gender diversity and financial performance (see e.g. the differences in the results in the studies by Dezsö & Ross, 2012; Ahern & Dittmar, 2012; Carter et. al, 2010). The evidence is even less salient on the Swedish market. Therefore, the purpose of this study is to examine if there is a relationship between gender diversity and financial performance. This study investigates gender diversity on the board of directors and the share of females is used as the main explanatory variable. Financial performance, the dependent variable, is measured by an approximation of Tobin's Q. Moreover, the Swedish market is investigated. To carry out the purpose of the study, the authors seek to answer following research question:

Is there a relationship between gender diversity on the board of directors and firms' financial performance on the Nasdaq OMX Stockholm?

Fundamentally, the overarching problem is inequality and gender diversity. This problem is synthesized in this study by three tools. These are the Swedish market, the board of directors and financial firm performance.

The results in the empirical literature can be summarized as ambiguous, as previously stated. This is the primary reason why this study is conducted, as the authors aim to contribute with clarity to the inconsistency.

One stream of the results in the literature finds a positive relationship (see e.g. Dezsö & Ross, 2012; Carter, Simkins & Simpsons, 2003; Campbell & Minguez-Vera, 2008; Lückerath-Rovers, 2013), another stream finds a negative relationship (see e.g. Ahern & Dittmar, 2012; Adams & Ferreira, 2009; Bøhren & Strøm, 2010) and the last stream finds no significant relationship at all (Carter et. al, 2010; Marinova, Plantenga & Remery, 2016).

There are several suggestions to why the empirical literature is inconclusive. Firstly, the previous studies do not examine the same time period and market (e.g. Ahern and Dittmar (2012) examine the Norwegian market between the years 2001-2009, while Dezsö and Ross (2012) examine the American market between the period 1992-2006). Thus, it is possible that contextual differences are at play as previous studies look into markets in different cultures. Secondly, there is a disparity in the methods and the type of data used (most of the studies use Tobin's Q as the main dependent variable and panel data, but exceptions from this are Lückerath-Rovers (2013) and Carter, Simkins and Simpsons (2003). Thirdly, previously conducted studies such as Carter, Simkins and Simpson (2003) look at different industries and try to control for these, others have utilized an industry standard classification (Adams & Ferreira, 2009), Lückerath-Rovers (2013) only control for the financial sector while Campbell and Minguez-Vera (2008) does not control for industry at all. These types of controls, or lack of controls, for industries could lead to ambiguous results. Finally, this type of research is subject to reverse causality and endogeneity which hinder interpretations of conclusions.

To counteract the opacity in the empirical literature and thus contribute with a robust result, the authors aggregate the most suitable previous methods. Firstly, the Swedish market is chosen since it is considered to already be relatively gender diverse, as detailed by the second national

fund (Andra AP-fonden, 2018). The presence of a considerable number of females in the population is required in order to conduct the research. Additionally, there is a research gap in the Swedish market. The problem with different time periods on the markets examined is solved by using panel data. Secondly, the disparity in the methods is mitigated by choosing variables that have been shown to have an explanatory effect on firm performance. These are controlled for whilst scrutinizing the effect by the share of females. Thirdly, the paper controls for industries in order to create a sample that reflects the real impact the share of females has on financial firm performance while acknowledging potential differences between industries. Finally, fixed effects are used to mitigate the problem of endogeneity. Reverse causality is tested to see whether the dependent variable has an effect on the explanatory variables if causal evidence is found. This is further elaborated in the method section. With this in mind, the authors have the ambition to contribute to the empirical literature with a conclusive and robust result.

This study investigates the relationship between gender diversity on the board of directors and financial firm performance. This relationship is predicated on the assumption that the board of directors affects the firm's financial performance. Fama and Jensen (1983) argue that the board of directors is the most vital organ in an organization and the best way to abate asymmetric information. By reducing the asymmetric information, costs of mitigation are reduced. Pfeffer and Salancik (1978) argue that the primary objective of the board is to mediate the relationship between the organization and its resources. The boards should also reduce external risks in order to guarantee the survival of the company. Moreover, if gender diversity on the board of directors is related to the financial performance of a firm, it is implied that there are differences between male and female directors. Kim, Burns and Prescott (2009) argue that this is the case. Byrnes, Miller and Schafer (1999) suggest that females tend to be more risk-averse than their male counterparts while Adams and Funk (2012) claim the opposite. Moreover, female directors tend to be educated to a higher degree (Carter et al., 2010). Adams and Ferreira (2009) further argue that females tend to have better attendance on meetings and engage in committees. With this reasoning, it is suggested that the board in itself and its composition is relevant in relation to financial firm performance.

The results of this study show no significance in the examined relationship. This is in line with the stream of literature that suggests that the relationship between gender diversity on the board of directors and financial performance is non-existent.

The remainder of the study is structured as follows. Section two presents the theoretical framework used and a review of relevant literature on the topic. Section three, methodology, describes the empirical and theoretical approach and the data. Section four presents the results from the tests and regressions. Section five analyzes the results. Section six discusses the results and its implications. Section seven concludes the study. Finally, section eight provides suggestions for future research.

2. Theoretical framework

The motivation behind this study is fundamentally based on two assumptions. The first assumption is that there is a relationship between the board of directors and a firm's financial performance. The second assumption is that there is a difference in the leadership between men and women, thus leading to a diversification effect on the board of directors. In the following, the authors outline theories that support these assumptions, along with a literature review and a hypothesis development.

2.1 The board of directors and financial performance

2.1.1 Agency theory

The main point of the agency theory concerns the dynamics of the disassociation between the ownership in an organization and the control in the same organization. Fama and Jensen (1983) argue that the asymmetric information between agents and principals is a concern since it incurs costs for principals to monitor agents. They further argue that the agents should own a fraction of the value that the business creates in order to minimize agency costs. They also suggest that the appointment of a well-functioning board of directors is a solution to the problem. The board acts as a mitigator and hinders the risk that top management only acts in its own best interest and that the board of directors is the most vital organ for internal control. (Fama & Jensen, 1983) It is, therefore, argued that the board of directors is related to financial performance.

Kim, Burns and Prescott (2009) suggest that the actions that the board of directors and top management take are influenced by the structure of the board. This, in turn, influences financial performance. Moreover, diversity on the board of directors is argued to be beneficial when top management is monitored. However, it is not implied that diversity on the board of directors strengthens the financial performance of a company. (Carter et al., 2010)

The Agency Theory is extensively researched, and it is argued that it is proven to explain relationships within corporate governance. The main take away is that the board of directors mitigates agency costs and should, therefore, be related to financial performance. It is, however, according to the authors of this study not enough to explain and underline the assumption that there is a relationship between the board of directors and the firm's financial performance. Therefore, additional theories are elaborated.

2.1.2 Resource dependence theory

The resource dependence theory concerns how the behavior of an organization is affected by external resources. The theory was concretized in 1978 by Pfeffer and Salancik. They suggest that the board of directors' primary objective is to mediate the relationship between the organization and the external environment and its resources. They further outline that the board should minimize external contingencies and ensure the survival of the company. These external contingencies are mitigated effectively if the board accomplishes the following objectives. Firstly, the board should act in such a way that it contributes to resources in the form of competence. Secondly, the board should communicate with external parties. Thirdly, the board should establish and nurture the relationship with external parties. Finally, the board should create legitimacy towards the external environment. (Pfeffer & Salancik, 1978) Carter et al. (2010) reason that the resource dependence theory is an explanation as to why a more diverse board of directors has the capability of providing multifaceted information and thus improving decision-making. They also argue that since a large part of the human capital pertains to females, female board members give more access to the external environment. Therefore, Carter et al. (2010) claim that a more diversified board better represents a broad target group.

The resource dependence theory further indicates the assumption that there is a relationship between the financial performance of a firm and the board of directors. The theory has since its concretization been used to explain certain relationships, of which the diversity on the board of directors and improved decision making is of the highest relevance to this study. Besides Carter et al. (2010), Hillman, Canella and Paetzold (2000) also suggest that there is a relationship between the diversity on the board of directors and improved performance of a firm. This is largely due to the fact that a diversified board has a greater variety of potential perspectives to contribute with.

2.1.3 Stakeholder theory

The stakeholder theory is developed in response to the shareholder theory which concludes that the only group of interest in a company that should be considered when making business decisions are the shareholders. The stakeholder theory, in contrast, claims that all groups having an interest in a company should be considered stakeholders and that the business should answer to all of these. (Freeman, 1984)

The stakeholder theory can be argued to have relevance for this paper considering how females tend to be more risk-averse than men (Byrnes, Miller & Schafer, 1999) but also taking into

account the idea of how a more heterogeneous board better can represent the different stakeholders of the company (Cornell & Shapiro, 1987). The considerations of the risk aspect could be argued to be applied to the choice of female respective male board members, depending on whether the stakeholders of a company prefer a risk-taking or a risk-averse leadership. Furthermore, considering the wide-spread number of stakeholders connected to a company when one is taking the stakeholder theory into account, a heterogenous board constellation could be argued to better represent the different stakeholders than a homogenous board.

The stakeholder theory is further underlining the assumption that there is a relationship between the board of directors and financial performance since it indicates that a more heterogenous board better represents different stakeholders. In this way, the board is connected to the financial performance of a firm. Bearing this theory in mind, and the two others aforementioned, the authors argue that there is a solid foundation on which the assumption relies on.

2.2 Differences in the behavior between men and women

2.2.1 Risk Aversion

The difference between men and women regarding risk-aversion has been thoroughly researched. The majority of the empirical evidence suggests that women are more risk-averse than men. However, there is research pointing to the other direction. Adams and Funk (2012) show that females in boards tend to care less about tradition and security than men and the authors describe them to be more risk-loving than their male counterparts. Byrnes, Miller and Schafer (1999) on the other hand take a broad definition of risk-taking which includes many risk factors ranging from car driving to smoking while looking at variables such as different age groups and genders. In contrast with Adams and Funk (2012), Byrnes, Miller and Schafer (1999) find clear evidence of males being more risk-taking than females in almost every aspect of their studied variables. Furthermore, Jianakoplos and Bernasek (1998) study the risk-aversion regarding financial decisions comparing single female and single male households as well as couples living together. In their research, they are able to conclude that females are more risk-averse than males.

With the most research pointing in the direction that females are more risk-averse than males, it is argued that a higher gender diversity will change the decision making of the board of directors and, therefore, the financial performance.

2.2.2 Differences in relation to corporate governance

The research suggests that female leaders tend to be more risk-averse than their male counterparts and in some contexts the opposite. In relation to corporate governance, there seem to be additional differences and the most salient differences are elaborated in the following.

Adams and Ferreira (2009) study in their paper how different inputs are changed in the presence of women. Their results suggest that females tend to have better attendance on meetings and engage in committees and this has a positive effect on male directors, leading to them having higher attendance as well. Moreover, it is argued that boards that have higher diversity spend more resources on monitoring. This could have both a negative and positive effect. Adams and Ferreira (2009) suggest that increased monitoring will ease the conflict between agents and principals, thus leading to increased shareholder value. On the contrary, it is not unreasonable to think that excessive monitoring is detrimental and has a negative effect on financial performance.

Carter et al. (2003) find in their study that a more diverse board, i.e. the presence of women, will lead to greater independence. The reason behind this is that women contribute with a broader perspective by asking questions. A similar line of reasoning can be found in the study by Campbell and Minguez-Vera (2008). They argue that the presence of women leads to a greater understanding of markets since diverse customers are better represented. Moreover, they suggest that since more perspectives are evaluated on a corporate board, decision making and problem-solving can improve.

The differences outlined above between male and female leaders in relation to corporate governance suggest that the presence of female directors on the board has an effect on the actions taken by the board. This is then argued to have an effect on the financial performance of the firm.

2.3 Literature review

In the empirical literature, the relationship between gender diversity and financial performance is extensively researched. The authors perform a literature review of relevant research to get a comprehensive understanding of the subject. The empirical literature can be summarized as ambiguous, as there seems to be no clear consensus about the relationship. Fundamentally, the results of the research can be branched into three categories. The first category indicates that there is no relationship. The second category suggests that there is a positive relationship. The

last category indicates that the relationship is negative. In the following, the reviewed studies are presented systematically according to their results.

Results that show no relationship

The first category of findings from the literature indicates that there is no relationship at all between gender diversity on corporate board of directors and financial performance of companies. A prominent study showing this result is done by Carter et al. (2010). The authors succeed a previous study from 2003 and find this time no significant relationship between neither gender or ethnic diversity on the board and financial performance of companies when Tobin's Q is used. However, they do find a significant relationship when return on asset is used. The study from 2010 is based on panel data covering 641 different companies during the time-period 1998-2002 on the S&P 500. Since they do not find causal evidence with Tobin's Q, they argue that the appointment of women to boards should not focus on the business case for women. Moreover, Joecks, Pull and Vetter (2013) does not find any significant relationship unless the share of women on the board surpass 30 %, a *critical mass*. Finally, Marinova, Plantenga and Remery (2016) find the same results in their study which looks to cross-sectional data of 186 publicly listed companies. The study is limited to solely one year. However, the authors of this study believe that it is of relevance to include it to give a nuanced picture of the empirical literature.

Results that show a positive relationship

Carter, Simkins and Simpson (2003) conduct a study on the American market based on cross-sectional data. Their primary objective is to examine the relationship between financial performance and the representation of women and ethnic minorities. Their findings show a positive relationship and furthermore, quite intuitively, that the share of females and minorities typically increase with the firm and board size. The authors mean that diversity should imply better decisions and problem solving, even if it in the beginning might increase the number of conflicts. This is due to that more perspectives are taken into consideration. Campbell and Minguez-Vera (2008) find in their study of the Spanish market that there is a positive correlation between share of females in the board and Tobin's Q. The scrutinized time period is 1995-2000. In a more extensive study of the American market, Deszö and Ross (2012) find a statistically significant relationship between females in top management and financial performance. They examine the period 1992-2006 and the study is based on panel data, containing 1500 companies. The positive relationship is, however, only significant when the companies' strategies are centered around innovation. Finally, Lückerath-Rovers (2013) study

99 Dutch companies during the years 2005-2007. The results of the study show a positive relationship between the share of females and the ratios ROE, ROS and ROIC.

Results that show a negative relationship

Adams and Ferreira (2009) find in their study that the aggregate effect of gender diversity on corporate boards on firm performance, which was measured looking at Tobin's Q, is negative. Their study use panel data and covers the American market looking at a time-span of the years 1989-2002. They argue that one reason for the outcome might be that a more diverse board puts more emphasis on monitoring. This is specific for companies with existing high governance. The authors argue that this is because a potential increase in the share of females might lead to excessive resource allocation on monitoring. Consequently, this affects the shareholder value negatively. Moreover, Bøhren and Strøm (2010) and Ahrens and Dittmar (2012) find a negative relationship in their studies of the Norwegian market. These two studies are particularly interesting considering they look at a market on which the government decided on a gender quota in 2003. Bøhren and Strøm (2010) examine firms over the period 1989-2002 which means that they are looking at a time-period before the gender quota was put in place. The other study, conducted by Ahern and Dittmar, looks to the time-period between 2001-2009 with all companies being present on the Oslo stock exchange. This study takes the time when the gender quota was established into account. Both the studies find, as mentioned, a negative relationship. Ahern and Dittmar (2012) suggest that the reason for this might derive from less experience women being selected into positions due to the gender quota.

Summary and critical reflection

The literature review indicates that there is no clear consensus and that the results from previously conducted studies are ambiguous. By scrutinizing the studies thoroughly, it is possible to identify potential reasons for this. Firstly, it is arduous to properly interpret results and conclusions since research on corporate governance is subject to endogeneity and reverse causality. Secondly, the previous studies that have been made are looking at various time-periods and markets in different cultures. Due to this, they are hard to compare. Ultimately, the methods used in previous research differs and various variables are being taken into account.

2.4 Hypothesis development

In the theoretical framework, two central assumptions for this study are presented, elaborated and motivated with theory and research. The first assumption concerns that there is a relationship between the board of directors and the financial performance of a firm. This

assumption is motivated by three well-researched theories. These theories have been synthesized in the empirical literature and there seems to be a relation between the board of directors and financial performance. The second assumption is that a more gender diverse board of directors will affect the financial performance of a firm. This is, in turn, predicated on the assumption that there are differences in the leadership and behavior between male and females. In section 2.2, the authors outline several differences that have been researched. They concern risk-aversion and corporate governance behavior. With these three factors, the two assumptions and the literature review, the authors choose to develop hypotheses based on three possible outcomes. The first suggest that the share of females on the board of directors does not have any significant impact on financial performance, the second that the share of females have a positive impact and the third that the share of females have a negative impact. The hypotheses are formulated as follows:

H0: There is no significant relationship between the share of females on the board of directors and financial performance.

H1: There is a significant positive relationship between the share of females on the board of directors and financial performance.

H2: There is a significant negative relationship between the share of females on the board of directors and financial performance.

3. Methodology

In this section, the way the study is conducted, the data, the theoretical and empirical approach, the variables, the regression model, a critical reflection and the authors reflection on the study's reliability are presented.

3.1 Overview

The method used in this study is based on a quantitative and deductive approach. In the following, the authors will elaborate on the data collected and the empirical approach used.

The study investigates the Swedish market. There are several reasons for this. Firstly, the authors of the study are Swedish which contributes to an understanding of the Swedish market. Secondly, the World Economic Forum (2018) place Sweden in third place on their annual ranking of gender equality. This implies that, comparatively, Sweden is one of the countries in the world where females occupy a high share of positions of power and trust. From this assumption, the authors derive that there is a sufficient sample of companies with females in positions of power and trust. The statistics provided by the National Second Pension Fund of Sweden suggest that this is the case as well (Andra AP-fonden, 2018). If this would not have been the case, a statistical analysis of the relationship would be pointless. Thirdly, the empirical evidence on the Swedish market is scarce. No particular reason behind this is found and it is believed that there is a research gap on the Swedish market. Fourthly, a law proposal was laid forward by the Swedish Government in 2016 about a gender quota (Government Offices of Sweden, 2016). If this quota were to be legislated, it would be of relevance to anticipate potential financial impacts of it. Finally, data accessibility and reliability of the Swedish market is deemed adequate. Publicly listed companies in Sweden are required to publicly disclose financial reports to the Swedish Financial Supervisory Authority (Government Offices of Sweden, 2007). The database Modular Finance Holdings, which holds extensive information on corporate governance variables on Swedish companies, is another reason to why the Swedish market is chosen.

The authors choose to look at the board of directors in relation to gender diversity. There are several reasons for this choice. The board is argued to have substantial responsibility for strategic decisions and to set up directions for the behavior of the company in order to ensure long term value-adding capability (Swedish Corporate Governance Board, 2016). Furthermore, the board is subject of being discharged from liability by the shareholders (Government Offices

of Sweden, 2005). The board is also argued to act in the shareholder's interest in maximizing profit. Looking at the board from a gender diversity perspective further makes sense considering that the code of Swedish Corporate Governance Board states that all Swedish boards should strive towards equal representation of the two genders (Swedish Corporate Governance Board, 2016). With this in mind, it is argued that it is of relevance to look at the board of directors. Furthermore, the authors also believe that the composition of the board is of relevance in relation to the financial performance of a firm, as outlined in section 2.1. Another reason why the board of directors is chosen and equated as positions of power and trust is that previous research has focused on it, this is elaborated in section 2.3.

The authors choose to look at the financial performance of firms. This choice is fundamentally predicated on two reasons. The first reason is that one of the primary purposes of a company is to generate profit (Government Offices of Sweden, 2005). The second reason is derived from that a substantial part of previous research looks at financial performance. This will enhance the comparability of this study. It could, however, be argued that the decisions of the board of directors do not instantly affect financial performance and that it, therefore, is not coherent to examine this relationship. Bearing this in mind, the authors still argue that the relationship is relevant to investigate. Tobin's Q is used as a proxy for financial firm performance. The measure has its limitations considering it uses market based and accounting figures, but it is widely used in the empirical literature and therefore deemed most comparable. Moreover, ROA is also used as the dependent variable in order to enhance the robustness of the result.

3.2 Data/Sample

Data Collection

The study is based on secondary data collected in March 2019. The financial data (i.e. Tobin's Q, Firm Size, Leverage and Return on Assets (ROA)) is collected from Bloomberg. The data on corporate governance (i.e. Share of Females, Board Size, Average Age of Board, Gender of Chair) is extracted from Modular Finance Holdings. In the case of missing data, the authors look through annual reports to find the relevant information.

Selection Criteria

The time period investigated is 2013-2017. The primary reason behind the choice of this time period is to keep the study up to date. Years prior to 2013 are excluded due to the perceived accessibility of financial data in the Bloomberg terminal is poor. 2018 is excluded since the data on the corporate governance variables is not validated by Modular Finance Holdings.

This study investigates mid- and large-cap companies listed on Nasdaq Stockholm OMX, with a Swedish tax base. The reason behind the exclusion of firms with smaller capitalization is that the share of females on the board of directors is lower on these firms (Andra AP-Fonden, 2018). The inclusion of these firms could, therefore, possibly skew the results. Moreover, financial firms and real estate companies have been excluded since they have high asset bases and that their capital structure differs from other companies, which could possibly skew the results. This is in accordance with previous literature (see e.g. Campbell and Minguez-Vera, 2008).

Final Sample

After refinement, the sample consists of 719 firm-year observations from 163 separate firms during the chosen time period. The final sample differs from the original one due to the selection criteria. All observations in the final sample are included in order to avoid selection bias, despite not all companies appearing in the data sample each year. This makes the panel data unbalanced but this has no implications for this study.

3.3 Theoretical Approach

The theoretical framework is partly based on a number of theories. These are chosen in accordance with two criteria. Firstly, they are well established and supported. Secondly, they need to be used and tested by the authors of the articles that are included in the literature review.

The literature review is based on the following. Firstly, the chosen articles need to be peer-reviewed and published in a journal with a rating by the Association of Business Schools of at least three (ABS, 2015). Secondly, articles that examine different markets and time periods are chosen in order to get a nuanced picture of the empirical evidence. Finally, the articles are accessible via either LUBsearch or Google Scholar. These studies are then analyzed by the authors systematically in accordance with their results.

3.4 Empirical Approach

Panel Data and Regression

This study has the aim to investigate whether a higher share of females on the board of directors affects the financial performance of a firm. In order to test this relationship, the authors carry out a multiple regression analysis on panel data. The reasons for the choice of panel data are several. Panel data implies both time-series data and cross-sectional data. This fact makes it possible to analyze certain factors that would not be possible with cross-sectional data.

Particularly for this study, the choice of panel data makes it possible to study causality (Woolridge, 2013). Another advantage is that panel data enables to remove delusive effects of specific years. Additionally, it enables to show how market value develops over time.

Issues in the model and mitigations

The first issue that needs to be taken into consideration in the model is endogeneity, which means that independent variables are correlated with the error term. This implies that the inference is based on parameters that are biased. Roberts and Whited (2012) mention that one way to abate this problem is to use fixed effects in the OLS panel regression. With fixed effects, time constant unobservable factors are removed, a model that has been applied in this study. In order to mitigate a potentially heteroscedastic sample, robust standard errors are used (Brooks, 2014). Moreover, the Gauss-Markov theorem applies to this study's multiple regression as well. The assumptions are the following (Woolridge, 2013): There should be linearity in the parameters of the regression model, the sample should represent the population, there should be no perfect correlation between the independent variables (i.e. multicollinearity), the error term should not be correlated to the explanatory variables, the error term should be homoscedastic. In order for the assumptions to hold for multiple regression, the authors carry out diagnostic tests. These concern normality, linearity, heteroscedasticity and multicollinearity. (Woolridge, 2013) The tests conducted are Jarque-Bera normality test, Ramsey RESET test for linearity, Breusch-Pagan test for heteroscedasticity and a correlation matrix for multicollinearity. The results from these diagnostic tests are found in section 4.3.

If the authors obtain significance for the main investigated relationship, reversed causality will be tested to see if Tobin's Q affect the share of females.

3.5 Variables

Dependent Variable

The dependent variable used in the econometric model is Tobin's Q, which is defined by Chung and Pruitt (1994, p. 70) as: "...the ratio of the market value of a firm to the replacement cost of its assets...". The data of this variable is extracted from Bloomberg, which uses the same approximation as Chung and Pruitt (1994). The approximation can be seen in equation 1. This measure is widely used in the empirical literature, as explained in section 2.3. Montgomery and Wernerfelt (1988) argue that it is a good proxy for competitive advantage. Furthermore, it is argued to account for risk (Campbell & Minguez-Vera, 2008). Jermias and Garni (2014) argue

that the measure is reliable since it is partly based on market-based numbers, which is not subject to manipulation.

$$\text{Tobin's } Q = \frac{\text{Market Value} + \text{Preferred Stock} + \text{Total Debt} - \text{ST Assets}}{\text{Total Assets}}$$

Although Tobin's Q is the main dependent variable of this study, a regression with ROA as the dependent variable is performed as well. This is done since ROA differs from Tobin's Q in the way that it is a measure of operating performance and it is accounting based.

Independent Variable

The share of females on the board of directors is used as the main independent variable. This is in line with the proposed gender quota in Sweden, which also focuses on the share of females (Government Offices of Sweden, 2016). As laid out in section 2.3, the share of females is commonly used in the empirical literature. Another reason for using the share of females, and not a dummy variable, is that the relationship is easier to interpret. Furthermore, a reason for not using the number of females is that the number does not consider the whole board size.

$$RFemales = \frac{\text{Female Directors}}{\text{Total Number of Directors}}$$

Control Variables

In this study, the authors choose to control for firm and board characteristics that are known to affect firm performance. These are outlined below.

Firm characteristics

Firm Size

Firm size is known to affect firm performance and it is therefore controlled for in accordance with previous studies (e.g. Carter, Simkins & Simpsons (2010)). In this study, sales is used as a proxy for firm size. Bøhren and Strøm (2010) and Marinova, Plantenga and Remery (2016) use sales due to its correlation to value creation in asset-pricing. Another way to proxy firm size is to use total assets. Assets are, however, related to Tobin's Q, and is therefore deemed less appropriate to use. The natural logarithm of sales is used, in accordance with previous research and in order to enhance interpretation.

$$Firm\ size = LN(Sales)$$

Leverage

Leverage is controlled for since higher leverage has been shown to be an effective mechanism to mitigate agency conflicts and should, therefore, have a positive effect on Tobin's Q (Campbell & Minguez-Vera, 2008). The leverage is calculated in this study as the debt to equity ratio, where book values are used. The natural logarithm is used in order to enhance interpretation and is in accordance with previous literature (see e.g. Carter, Simkins & Simpsons (2010); Bøhren & Strøm, 2010; Ahren & Dittmar (2012))

$$Leverage = LN\left(\frac{Debt}{Common\ Equity}\right)$$

ROA

Return on assets is used in previous studies as a measure of financial performance and as a dependent variable (see e.g. Erhardt, Werbel & Shrader, 2003; Bøhren & Strøm, 2010). This study uses the ratio mainly as a control variable. The reason for this is that a more profitable company should have a higher value and should thus be reflected in Tobin's Q (Campbell & Minguez-Vera, 2008). Moreover, the robustness of the study's results is checked with ROA as the dependent variable. Due to certain outliers in this variable, it is winsorized.

$$Return\ on\ Assets = \frac{Net\ Income}{Total\ Assets}$$

Board characteristics

Board Size

The size of the board is included as a control variable, in accordance with previous research (see e.g. Campbell & Minguez-Vera (2008); Carter, Simkins & Simpsons (2010); Bøhren & Strøm, 2010). The reasoning behind this is that larger companies are suggested to have more directors on the board and thus a higher share of females (Chapple & Humphrey, 2013). The statistics from the second national pension fund underline that this is the case (Andra AP-fonden, 2018). Moreover, Fama and Jensen (1983) argue that the size of the board has an effect on the board's ability to monitor and advice. It is, therefore, argued to have an effect on firm performance and is included. Furthermore, employee representatives have been excluded from the total number of directors on the board, as they are not elected by shareholders at the annual general meeting. The natural logarithm is used, in accordance with previous research (see e.g.

Campbell & Minguez-Vera (2008); Carter, Simkins & Simpsons (2010); Bøhren & Strøm, 2010) and to enhance interpretation.

$$\text{Board Size} = \text{LN}(\text{Total board members})$$

The average age of the board

In previous research, it is common to control for the average age of the board members (see e.g. Carter et al., 2010; Ahren & Dittmar, 2012). This is done by summarizing the age of each board member and dividing it by the total number of board members. The reason for the inclusion of the variable is that research has shown that older board members tend to contribute with a greater amount of thoroughness in information research and decision-making (Taylor, 1975) while younger board members are connected to higher growth (Child, 1974). Therefore, the authors argue that an omission of the variable would lead to biased results.

$$\text{Average age of the board} = \text{LN}\left(\frac{\text{Total Age of Directors}}{\text{No. of Directors}}\right)$$

Chair (female/male)

In line with the reasoning in section 2.2 about differences between male and female leaders and directors, the authors argue that it is of relevance to control for the gender of the chair. Being the leader of the board, the position can be argued to imply higher responsibility than the other board members and therefore higher potential to affect firm performance. The variable is constructed as a dummy.

$$\text{Gender chair} = \text{DFemale}$$

Industry, year and large-cap dummies

In order to control for different industry-specific and year-specific characteristics, the authors use dummy variables. This is done in order to control for specific exogenous events that might affect the industries and years. Previous research is inconclusive regarding the usage of industry dummies, with absence and inconsistency in classifications possibly contributing to ambiguous results. However, since Tobin's Q is a market-based measurement and different markets will hold different characteristics in terms of financial numbers, a dummy variable controlling for the different markets is deemed to be of importance. The different markets have been classified using Bloomberg's definition when extracting the data. Finally, the authors include a dummy

for large-cap companies, as they, on average, have a higher share of females on the board of directors (Andra AP-fonden, 2018)

3.5 Regression model

The panel data regression model that is used in this study is the following:

$$\begin{aligned} TQ_{it} = & \alpha + \beta_1 (RATIO\ FEMALE S)_{it} + \beta_2 (LN\ FIRM\ SIZE)_{it} \\ & + \beta_3 (LN\ LEVERAGE)_{it} + \beta_3 (ROA)_{it} + \beta_4 (LN\ BOARD\ SIZE)_{it} \\ & + \beta_5 (AVERAGE\ AGE\ BOARD)_{it} + \beta_6 (CHAIR\ GENDER\ Dummy)_{it} \\ & + \varepsilon_{it} \end{aligned}$$

3.6 Critical reflection of the used method

The dependent variable, Tobin's Q, is commonly used in previous research. This is the main reason why the authors of this study also use this as a measure of financial performance. One reasonable critique that can be put forward is that the measure uses accounting-based figures and market-based figures. One could argue that the measure, therefore, is not consistent. However, with the measure being used to a great extent in the empirical literature, the authors still deem it to be a reasonable measure to utilize. Also, it enhances the comparability with previous findings. Moreover, it could be argued that the measure should be lagged, in order to account for the assumption that decisions from the board of directors do not take immediate effect. However, even if this is a reasonable argument, the authors believe that it would be arduous to determine the exact time lag to use.

The authors choose to look at gender as the only factor in regard to diversity on the board of directors. It is not unreasonable to think that there are other factors than gender that affect the heterogeneity on the board of directors and thus the financial performance. Nevertheless, gender is chosen as the only factor and this is predicated on two reasons. Firstly, the data on this variable is comparably easily accessible. Secondly, this variable is arguably the most salient in the empirical literature and is, therefore, chosen to enhance comparability. Moreover, Campbell and Minguez-Vera (2008) argue that gender is the most researched factor in terms of diversity.

The data of this study are collected from two databases, Bloomberg and Modular Finance Holdings. Ideally, all the data would be from the same source since there might be certain

variations in how the two databases choose to collect information. However, the data is only on Swedish companies, i.e. they are regulated by the same legislation. Moreover, the authors perform spot checks to validate the data. Thus, the authors deem the data to be accurate.

3.7 Reliability

In relation to reliability, the study is based on panel data. This arguably makes the results sturdy over time. Moreover, the data is collected from trusted secondary sources and therefore not subject to the authors' subjective judgement. (Bryman & Bell, 2013) In relation to the selection of empirical studies, solely peer-reviewed articles are chosen to enhance the reliability of this study.

4. Result

In the following section, the descriptive statistics, panel regression output, regression diagnostics and hypothesis outcomes will be presented and explained.

4.1 Descriptive statistics

Descriptive statistics of the sample					
Variable	N	Mean	Min	Max	Std. Dev.
Tobin's Q	719	2,665	0,625	22,937	2,434
Female Ratio	719	0,286	0	0,667	0,138
Firm Size	719	18543.330	0	332738	40859,450
Leverage	719	0,713	0	32,932	2,154
ROA	719	6,981	-117,493	127,509	14,305
Board Size	719	6,850	2	13	1,571
Average Age Board	719	56,424	41	68	4,208

Table 4.1

Table 4.1 shows descriptive statistics of the sample that contains 719 firm-year observations between the years 2013-2017. The statistics show that the mean of Tobin's Q is 2,665. This is an indication that most of the companies in the sample have a higher market value than the approximated replacement costs. The minimum and maximum values are 0,625 and 22,937 respectively. The maximum value is substantial and could indicate that this particular company is abnormally valued or that it affected by an exogenous event. The minimum value suggests that some companies in the sample have a lower market value than their asset base.

In the table, the variable Female Ratio shows the share of females on the board of directors. There is a certain spread in this variable, as some companies have zero females on the board of directors, while others have as many as 66,7 %. Nevertheless, the mean of the ratio is 28,6 %. A conclusion that can be drawn from this is that most of the firms in the sample have an unequal amount of male and female directors.

Firm size is operationalized with sales. Some firms certain years have zero revenue and the maximum value of this variable is 332,738 a specific year. The spread is in other words significant. The minimum value could be considered as remarkable. A possible suggestion can be that the companies with zero sales are companies which had funding as a primary objective during that particular firm-year. The mean is closer to the minimum value than the maximum, suggesting that the sample contains a few substantially large companies.

The leverage, operationalized as the ratio between debt and common equity, has the mean of 0,713. The return on assets varies as well with some values that are argued to be extreme. The minimum value is negative and, therefore, the variable is not suitable to be used on a logarithmic scale. Instead, as it has been explained, the variable is winsorized.

The board size ranges from 3 to 13 members. The minimum value could be seen as remarkable. However, this is possible as the least number of directors is three (Bolagsverket, 2018). The average board has 6,9 directors. This number excludes employee representatives, as it is argued for in section 3.5. The last control variable for board characteristics, the average age of the board, is deemed to have a reasonable spread. The mean of the average age is relatively high, which is expected since a position on the board of directors is assumed to require certain experience.

4.2 Panel data regression output

	Result	
	Tobin's Q	ROA
SHAREFEMALES	-0.300 (0.207)	0.969 (5.405)
SALESLN	-0.069 (0.039)*	3.618 (1.915)*
LEVERAGELN	0.038 (0.022)*	-0.173 (0.375)
ROA_winsorized	0.005 (0.005)	
BOARDSIZELN	-0.054 (0.161)	1.133 (3.054)
AVERAGEAGEBOARDLN	-0.829 (0.445)*	3.102 (10.641)
FEMALECHAIR	-0.105 (0.110)	-0.152 (0.773)
_cons	4.906 (1.868)***	-37.219 (45.989)
N	719	719
r2	0.080	0.083
Standard errors in parentheses		
* p<0.10, ** p<.05, *** p<.01		

Table 4.2

This study conducts a multiple-regression controlling for robust standard errors and fixed effects as described in 3.5. The output can be seen in table 4.2. The variables that are mentioned are the main independent variable as well as the ones that are statistically significant. The results of the regression show that the main independent variable *SHAREFEMALES* is insignificant. This implies that the share of females on the board does not have a significant effect on the Tobin's Q and therefore, not on the financial performance of companies. The coefficient for the variable is negative by -0.3 This means that if the share of females were to be increased by 1 %, the Tobin's Q would decrease by 0.3 %. However, this relationship is as aforementioned, not statistically significant. Furthermore, as no significance for the relationship is obtained, reversed causality is not tested for.

The variable log of sales is significant on the 10 % level, meaning that it does have an effect on Tobin's Q. Furthermore, the variable has a negative coefficient of -0.069 which means that a 1 % increase in sales for companies should lead to a 0.069 % decrease in Tobin's Q.

The variable log of leverage is significant on a 10 % significance level. The variable has a positive coefficient of 0.038, this means that if leverage is increased by 1 %, the Tobin's Q and thus the financial performance is increased by 0.038 %.

The independent variable natural logarithm of age describes the log of the average age of the board members and is significant on the 10 % level. The variable has a negative coefficient of -0.829 meaning that a 1 % increase in the average age of board members should lead to a 0.829 % decrease in Tobin's Q and thus the financial performance.

A regression using winsorized ROA as the dependent variable is conducted and based on the same aforementioned premises as the one made using Tobin's Q as a dependent variable. This is made in order to control for an accounting based, operating performance measure as well. The results show that only the variable for sales, *SALESLN* is significant on a 10 % significance level meaning that the share of females does not have any significant impact on ROA.

4.3 Regression diagnostics

In the table below (Table 4.3) the correlation between the variables is shown is checked with a correlation matrix. There seems to be no multicollinearity as the highest correlation is 0.480, taking place between board size and sales. A correlation between two variables higher than 0.8 indicates multicollinearity (Woolridge, 2013).

Correlation Matrix							
	LN Tobin's Q	LN Sales	LN Leverage	ROA	% Females	LN Board Size	LN Avg. Age
LN Tobin's Q	1.0000						
LN Sales	-0.4211*** (0.0000)	1.0000					
LN Leverage	-0.1285*** (0.0006)	0.1071*** (0.0041)	1.0000				
ROA	0.1783*** (0.0000)	0.2234*** (0.0000)	-0.0153 (0.6820)	1.0000			
% Females	-0.1023*** (0.0060)	0.2627*** (0.0000)	-0.1506*** (0.0001)	0.0326 (0.3821)	1.0000		
LN Board Size	-0.1625*** (0.0000)	0.4796*** (0.0000)	0.0297 (0.4270)	0.0730* (0.0505)	0.2720*** (0.0000)	1.0000	
LN Avg. Age	-0.757** (0.0423)	0.0678* (0.0655)	0.0494 (0.1857)	-0.0855** (0.0218)	0.0820** (0.0279)	0.1893*** (0.0000)	1.0000

* p<0.10, ** p<.05, *** p<.01

Table 4.3

In Appendix 1, histograms of all the variables are shown both with and without the natural logarithm for the variables where it has been applied. This is done to test the normality of the variables and it can be concluded that it is the right decision to use the natural logarithm, which was argued for in section 3.4. Brooks (2014) further argue that natural logarithms are used to deal with kurtosis and skewness. This contributes to making the model more linear.

The Breusch-Pagan test can be found in Appendix 2 and shows that the null hypothesis of homoscedasticity is rejected, and that heteroscedasticity is present, which is assumed in section 3.4. However, with robust standard errors and the usage of panel data, the authors argue that the sample is as homoscedastic as possible. The Ramsey RESET test can be found in Appendix 3. The null hypothesis for the test is rejected and, therefore, the sample has omitted variable bias.

4.4 Hypothesis outcome

There are three potential outcomes of the hypotheses of this study. The null hypothesis (H0) suggest that there is no significant relationship, the second (H1) suggest that there is a

significant positive relationship and the third (H2) suggest that there is a significant negation relationship. The outcome is that the null hypothesis cannot be rejected, and no causal evidence is found.

5. Analysis

In this section, the regression output is analyzed.

5.1 Share of females

The agency theory implies that the board of directors is the best way to monitor agents. In this way, the composition of the board is important as it determines how efficiently the board monitors. Furthermore, the resource dependence theory and its application on real life suggest that a more diverse board should improve decision making and better represent a broader target group. Moreover, the stakeholder theory indicates that a more heterogeneous board better represent different stakeholders and should, therefore, be more effective. These theories, along with documented differences between males and females in regard to risk aversion and corporate governance, flows down to the assumption that there is a relationship between the share of females on corporate boards and financial firm performance. The results of this study, however, does not find any causal evidence between the share of females and Tobin's Q, even if it is worth to mention that the beta-coefficient is negative. It is strenuous to find reasons why this is the case. Although the theories make up a substantial part of the foundation of the hypothesis, it is of equal importance to analyze the result of this study in relation to empirical evidence.

When comparing the results of this study with empirical evidence, this study adds to the stream of literature that indicates that there is no relationship between the gender composition of the board of directors and financial firm performance. This is in line with the results of Carter et al. (2010), Joecks, Pulls and Vetter (2012) and Marinova, Plantenga and Remery (2016). It is arduous to compare the results of this study and the ones obtained by Carter et al. (2010), in the sense that they examine a whole different time period and market. Notwithstanding, the outcomes of both studies are rather similar. Although no causal evidence can be found, it is argued that the appointment of women to corporate boards should be based on other criteria than future performance. Moreover, Marinova, Plantenga and Remery (2016) base their study on cross-sectional data and thus limiting their research to one year. This hinders comparisons, even if the main results of both studies are the same with no causal evidence. Finally, Joecks, Pull and Vetter (2012) find in their study that if the share of females surpasses 30 %, there is a positive correlation with financial performance. Otherwise, there is no relationship at all. The mean of the share of females in the sample of this study is 28,6 % and this study finds no

relationship at all. This could possibly underline the argument by Joecks, Pull and Vetter (2012) that the share of females needs to surpass a *critical mass* in order to have an effect.

5.2 Control variables

The main independent variable in this study is the share of females. Nevertheless, the authors believe that it is of importance to analyze the other variables as well. Firstly, the statistically significant variables are analyzed. Secondly, the other control variables are briefly covered.

The result shows that sales has a negative effect on Tobin's Q. Intuitively, this is challenging to comprehend. The authors argue that a higher sales figure should imply higher market value and thus Tobin's Q. The variable is, however, significant at the 10 % level and the interpretation of it should proceed with caution. Marinova, Plantenga and Remery (2016) also use sales as a proxy for firm size. They find no statistical significance. A reason for the difference might be that they use cross-sectional data and not panel data, thus not controlling for specific year-effects. Bøhren and Strøm (2010) find in their study a negative correlation between Tobin's Q and the natural logarithm of sales, albeit not significant. It is, therefore, troublesome to properly interpret why the result of this study finds evidence of a negative relationship. A possible explanation is that some firm-year observations have the value of zero. These observations could be considered outliers and it cannot be excluded that they might skew the result. Moreover, it is possible that the result would have been different if these values were excluded.

Leverage is positively correlated with Tobin's Q. The relationship is statistically significant on the 10 % level. This is not strong causal evidence and should be interpreted with some caution. However, the result is in accordance with the line of reasoning with Campbell and Minguez-Vera (2008). They suggest that high leverage is an efficient mechanism to mitigate potential agency costs and should, therefore, be positively correlated with Tobin's Q. Therefore, the statistical significance of the variable in this study is not surprising.

The result of this study shows that as the average age increases, Tobin's Q decreases. There is statistical evidence of this relationship, even if it is not strong. The results seem to be in line with the reasoning that younger board members are related to higher growth, as laid out by Child (1974). The result is also in line with the one obtained by Carter et al. (2010).

Moreover, the rest of the control variables are covered shortly. Interestingly, the variables board size and chair gender both have negative coefficients. Even if there is no causal evidence, the

authors' intuition is that at least the board size would have a positive correlation since firms with higher market value should have more board directors.

Finally, the regression output with ROA as dependent variable shows that only sales is significant. This intuitively makes sense since sales is incorporated in the ratio. The authors choose to put no further emphasis on this.

6. Discussion

In the following section, the result obtained, and its implications are discussed.

Looking at the result of this paper, the authors can conclude that introducing a higher share of females on the board of directors neither increases nor destroys financial performance. In the introduction of this study, it is highlighted that there are primarily two perspectives to consider when investigating the implications of gender diversity on corporate boards. These are the business case and an ethical perspective. The results of this study show no causal evidence of that a higher share of females contributes to better financial performance. Therefore, it is suggested that there are no financial incentives for shareholders to appoint a higher share of females to corporate boards. Looking at this from the other way around, one could neither say that there are financial discouragements to appoint a higher share of females. Women are at least as highly educated as men and tend to be, according to Campbell and Minguez-Vera (2009), overlooked despite higher qualification.

Since this study shows no causal evidence for the business case, the results could possibly instead contribute to the ethical perspective, even if this is not the primary focus. The public narrative surrounding gender equality amasses traction continuously and the topic affects an ever-growing number of individuals. The resonating contemporary consensus sets forth that everyone should be given equal opportunities, regardless of their gender. Arguments have been made that gender quotas should be legislated in order to increase the presence of females in certain positions. The results of this study indicate that an increased share of females does not destroy firm value and can, thus, act in support of actions similar to the one proposed by the Government Offices of Sweden in 2016. As previously mentioned, a hindrance to having more female directors could be that the shareholders are argued to appoint board members in accordance with their financial interest. However, this study's results provide an argument to elect males and females based on the same premise. This should naturally facilitate companies becoming more gender equal.

The result of this study shows no causal evidence on gender diversity and corporate boards. As mentioned in the analysis, a *critical mass* of 30 % of females could be the reason why this is the case. That is, the share of females need to surpass this limit in order to imply significant effects. This could be an argument for potential future legislated gender quotas with a minimum limit of 30 % of females on corporate boards. However, the focus of this study is not to examine the specific limit when the share of females has a significant effect on financial performance.

Moreover, it is probable that there are other factors of diversification than only gender that affect the composition of corporate boards and financial performance. Sweden is, as previously mentioned, already comparably gender equal today. This could imply that there are only small differences in the behavior between the genders in Sweden.

Results from empirical studies are inconclusive regarding the preference for risk between males and females, despite most pointing towards females being more risk-averse. According to the empirical literature, this is argued to affect work-related behavior. The inconclusiveness in the literature might, however, be a reason as to why this study is not able to find any statistical significance regarding gender diversity and financial performance. It is also worth mentioning that the presented research is not conducted in Sweden. Furthermore, different companies operating in different markets have contrasting appetites for risk. Since this paper looks at a wide spread of companies, it might contribute to the lack of causal evidence.

As previously mentioned, it cannot be excluded that other external factors affect the results of this paper. Control variables and dummy variables for year, industry and large-cap are used to account for exogenous events. However, there is always a risk that occurrences compromise the results. Furthermore, as mentioned in section 1 and 3.1, the board is argued to impact the financial performance of a company. Nonetheless, similar to the reasoning in section 3.6, it is challenging to determine the cause and effect relationship between decision making and actual financial outcome. Another aspect affecting the results is that the model has omitted variable bias, as mentioned in 4.3. This means that there are other factors influencing the outcome of the result.

Finally, it is worth mentioning the results of this study and the theories used to support its implementation. The theories are used as a foundation for the assumption that gender diversity on corporate boards affects firm performance. This study finds no causal evidence and, therefore, it is questionable if the chosen theories are well fitted since they, in fact, suggest that there should be a relationship. Regardless of this, with a different outcome, it would still be arduous to pinpoint precisely what theories that underlie that particular outcome. There are numerous theories pointing in particular directions and this makes it challenging to detail their respective implications.

7. Conclusion

In this section, the way this study is conducted and the results, along with potential implications are summarized.

This paper investigates if there is a relationship between gender diversity on corporate boards and firms' financial performance, in other words, the business case for appointing more females to corporate boards. In order to do this, the authors conduct a multiple regression on panel data on mid- and large-cap companies on the Nasdaq OMX Stockholm stock exchange. The time period investigated is 2013-2017. Tobin's Q is used as the dependent variable for measuring financial performance among the firms in the sample while winsorized ROA is used for as well.

The results from the pooled OLS regression show that the variables sales, leverage and the average age of board members have a significant effect at the 10 % level on Tobin's Q. However, the main independent variable, the share of females on the board of directors, has no significant effect on Tobin's Q. The absence of causal evidence is in line with the findings of Carter et al. (2010), Joecks, Pull and Vetter (2012) and Marinova, Plantenga and Remery (2016).

The results of this study show no causal evidence. However, this does not necessarily imply that the results come without practical implications. Looking at the business case, the results suggest that an increased share of females on corporate boards does not affect financial performance, meaning that it neither increases nor destroys shareholder and firm value.

This means that shareholders driven by potential monetary gain do not have incentives in electing a more gender equal board. On the other hand, it also means that they have no reason not to and that female board members perform just as well as their male counterparts. Despite this, corporate boards are still largely unequal. Furthermore, the results have implications on an ethical level as well. As the education level among females in many cases surpass the one among males, females should be given the same chance as males in high-level positions such as boards. However, the change is taking place slowly and right now, Swedish boards only consist of 33,9 % females, but one could argue that the results do provide grounds for a quota or some type of regulation in order to achieve more gender-diverse boards. According to this paper, there are no reasons as to why they should not be diverse.

8. Suggestions for future research

Based on the learnings and difficulties the authors encountered while conducting this study, recommendations for future research is presented in this section.

This study is not the final answer to the question of how the share of female on the board affects companies in terms of firm performance. Potential reasons why the variable share of females is not significant are discussed in section 5 and 6. For future research, the authors would be interested in further investigating if there is evidence of a *critical mass* on the Nasdaq OMX Stockholm exchange which could show a significant relationship regarding gender diversity and financial performance. Furthermore, Sweden is among one of the world's most gender-equal countries, thus possibly erasing differences between men and women. Therefore, doing similar research in less gender equal countries would be highly interesting. Moreover, as discussed previously, there might be a time lag between decision making and actual effect. Because of this, it would also be interesting to further examine how to properly match decision and effect, for example by lagging the dependent variable.

Finally, another aspect that would be interesting to expand on is to look at diversity not only in terms of gender but also taking other factors into account. A reason why this paper only focuses on gender can be derived from the time limit of implementation. Regardless of the time limit, the authors would be interested in investigating the implications of factors such as ethnicity, education level, working experience, tenure at the company, share of foreign board members and monthly earnings. This could provide insights on how companies are able to optimize board performance by using various strengths related to different characteristics, in order to enhance financial performance.

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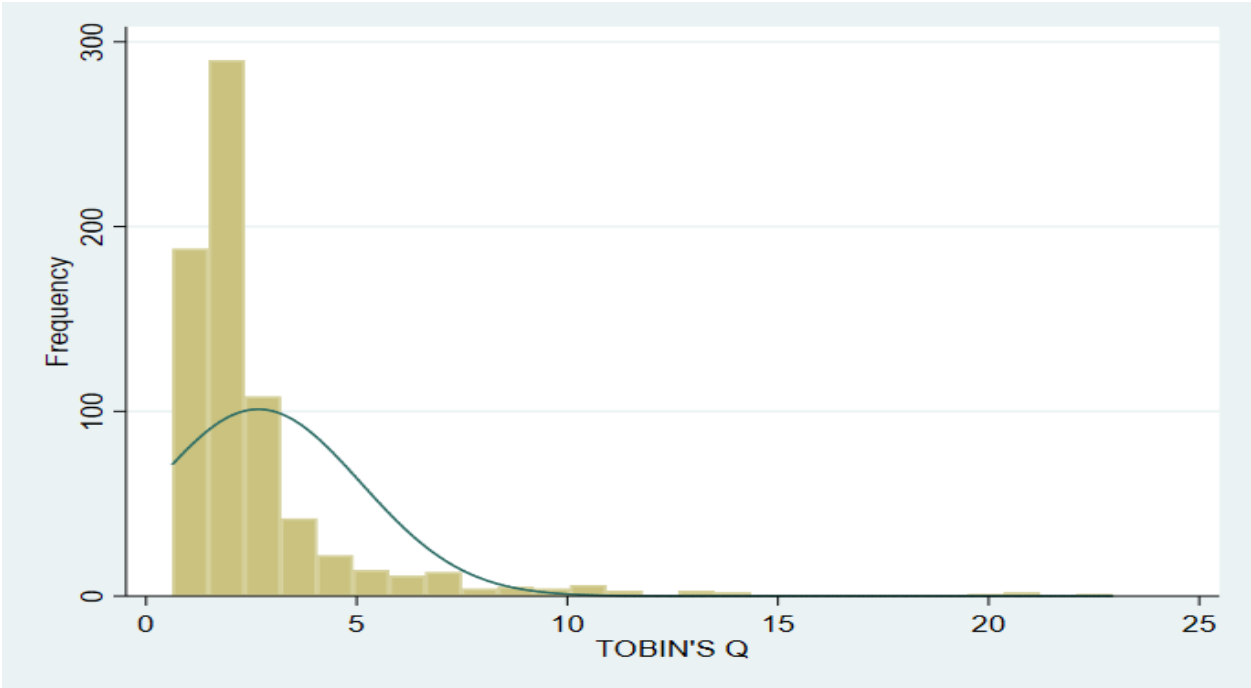
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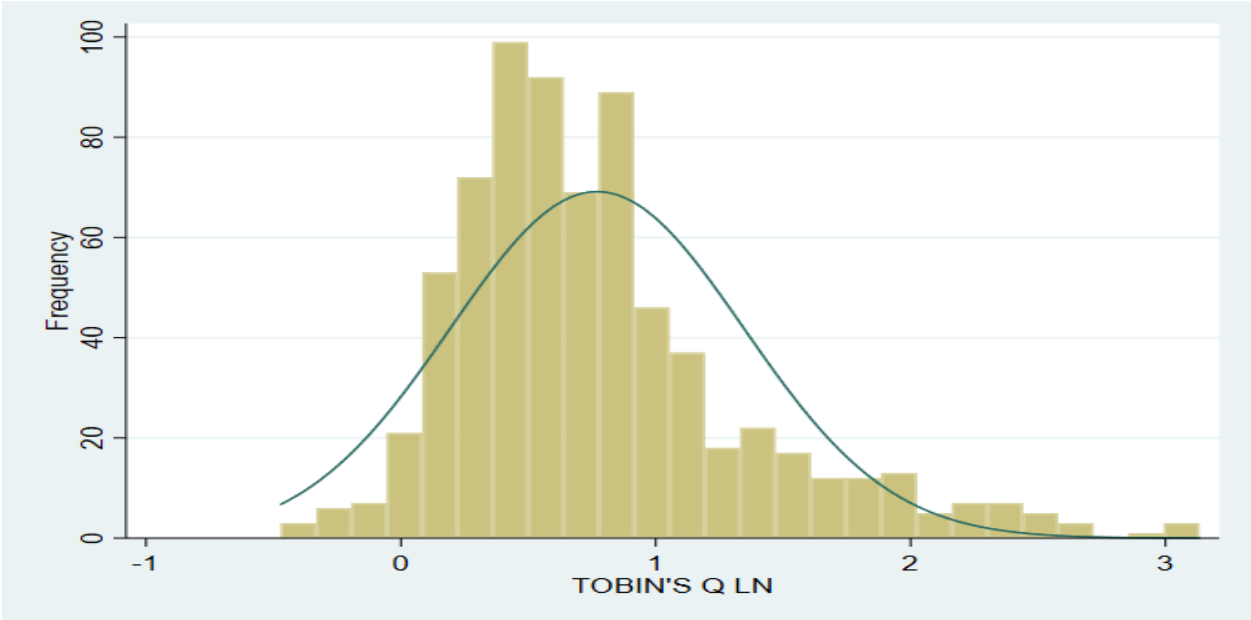
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Appendix 1 - Histogram

Tobin's Q

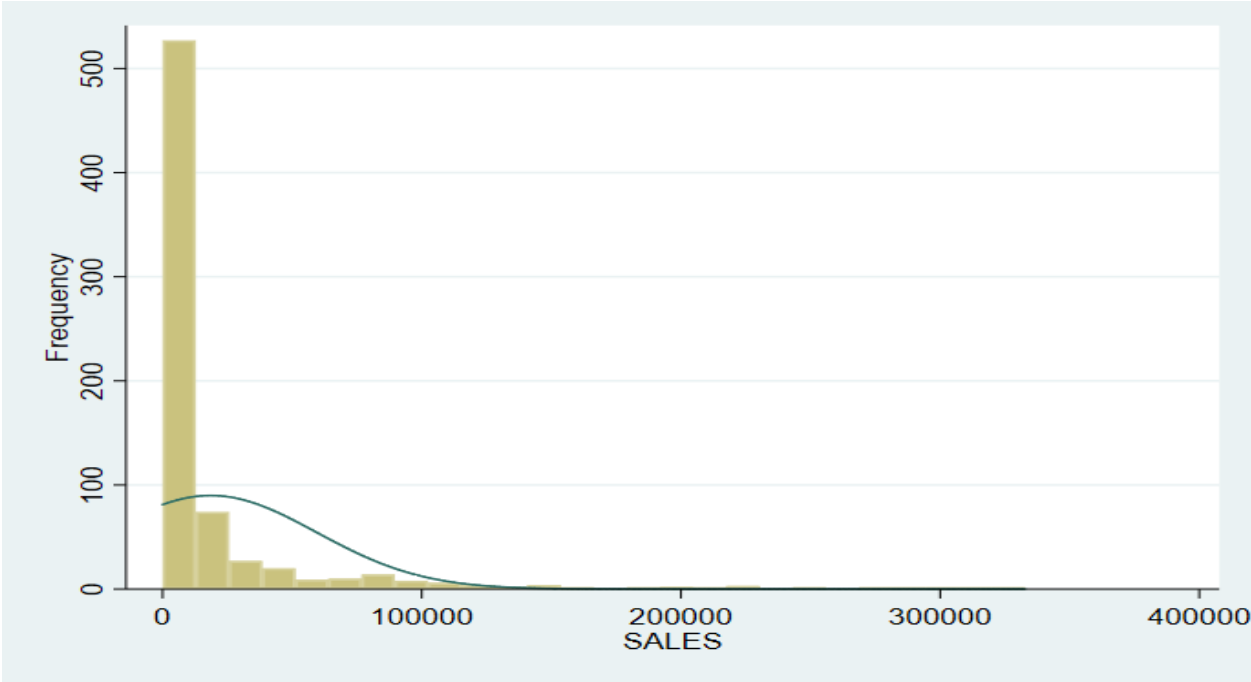


Tobin's Q LN

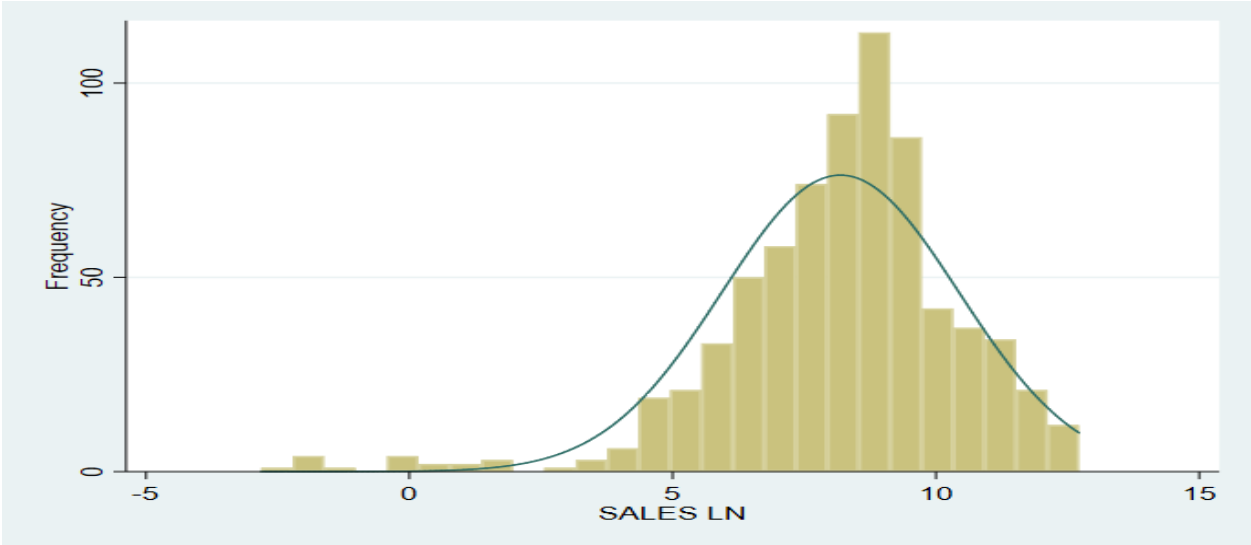


Variable	Obs	Mean	Std. Dev.	Min	Max
LN Tobin's Q	719	0.769	0.575	-0.471	3.133

SALES

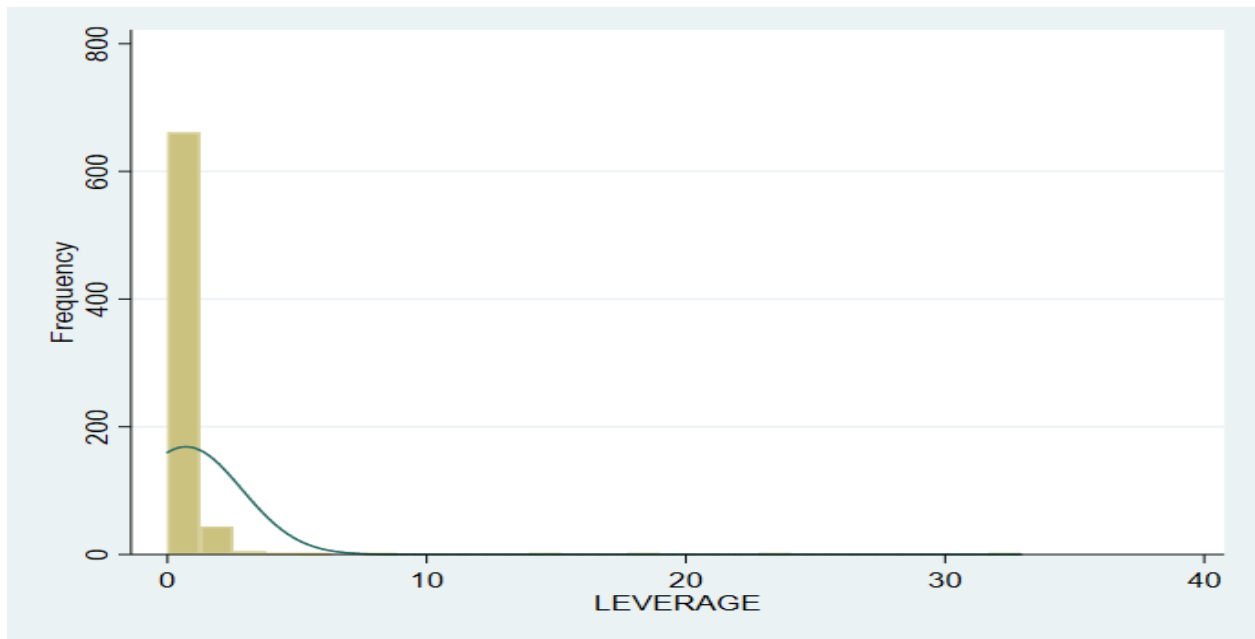


Sales LN

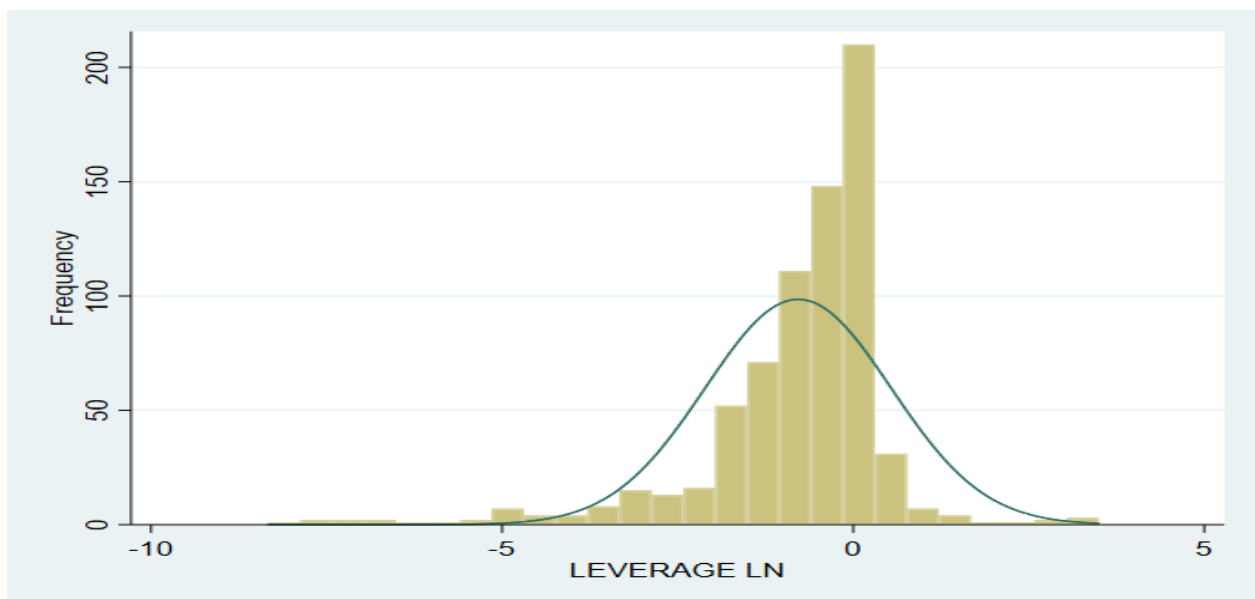


Variable	Obs	Mean	Std. Dev.	Min	Max
LN Sales	719	8.185	2.245	-2.813	12.715

Leverage

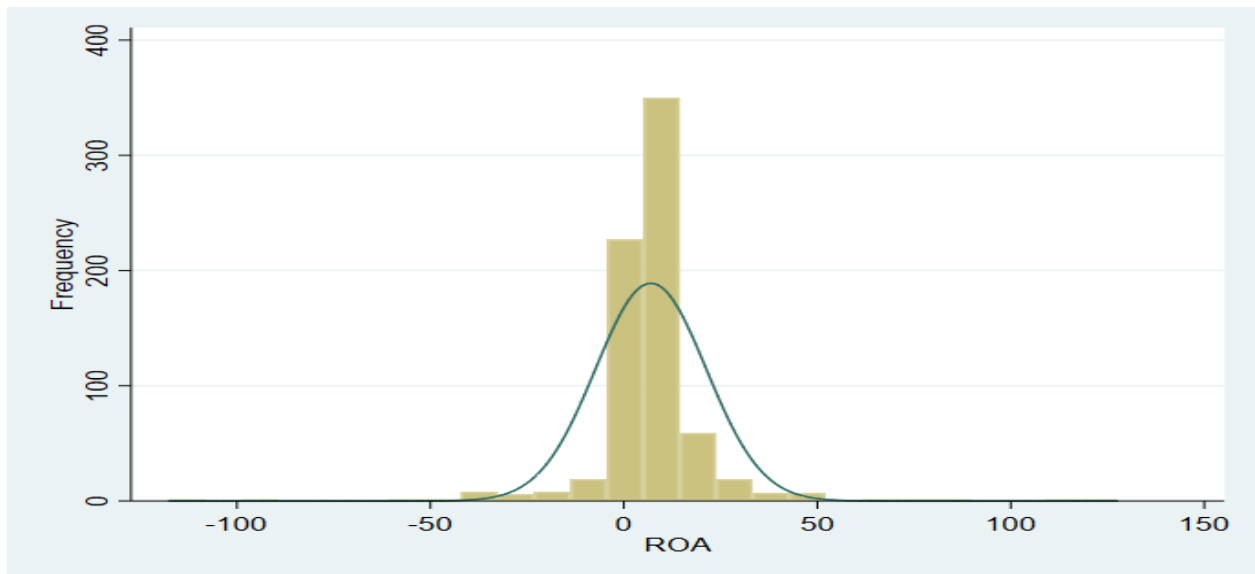


Leverage LN



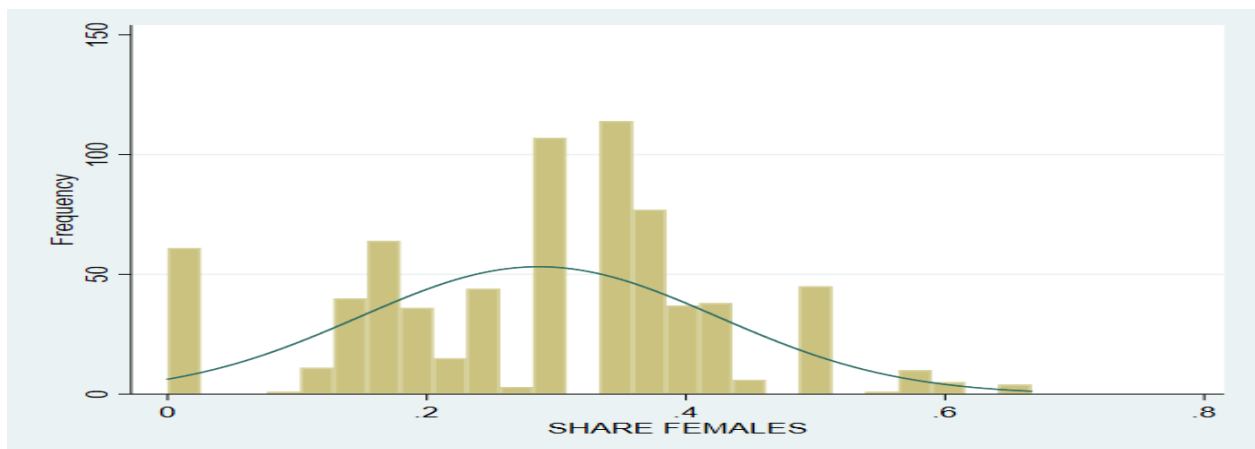
Variable	Obs	Mean	Std. Dev.	Min	Max
LN Leverage	719	-0.784	1.324	-8.331	3.494

ROA

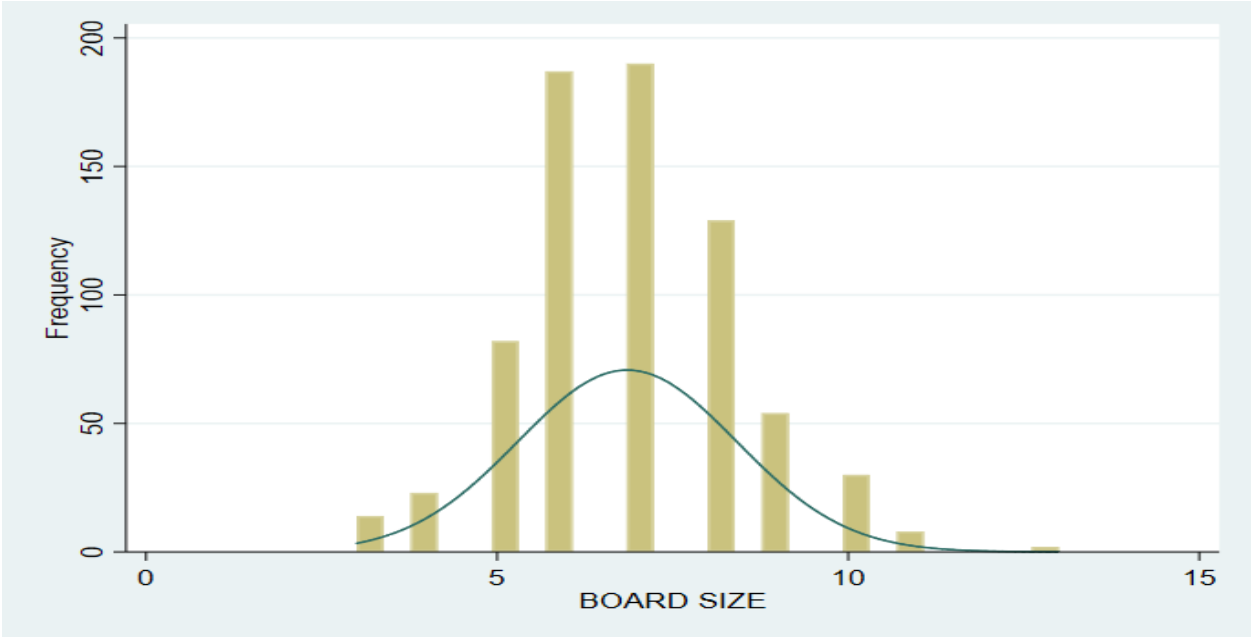


Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	719	6.876	11.095	-38.052	46.275

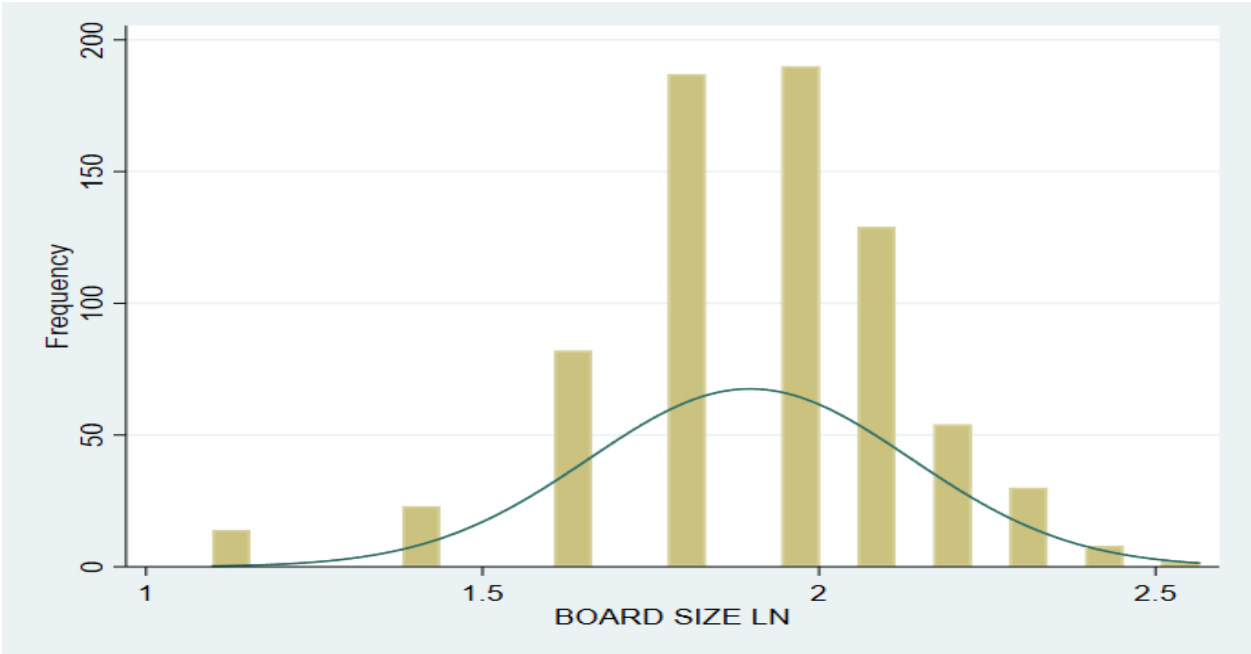
SHARE Females



BOARD SIZE

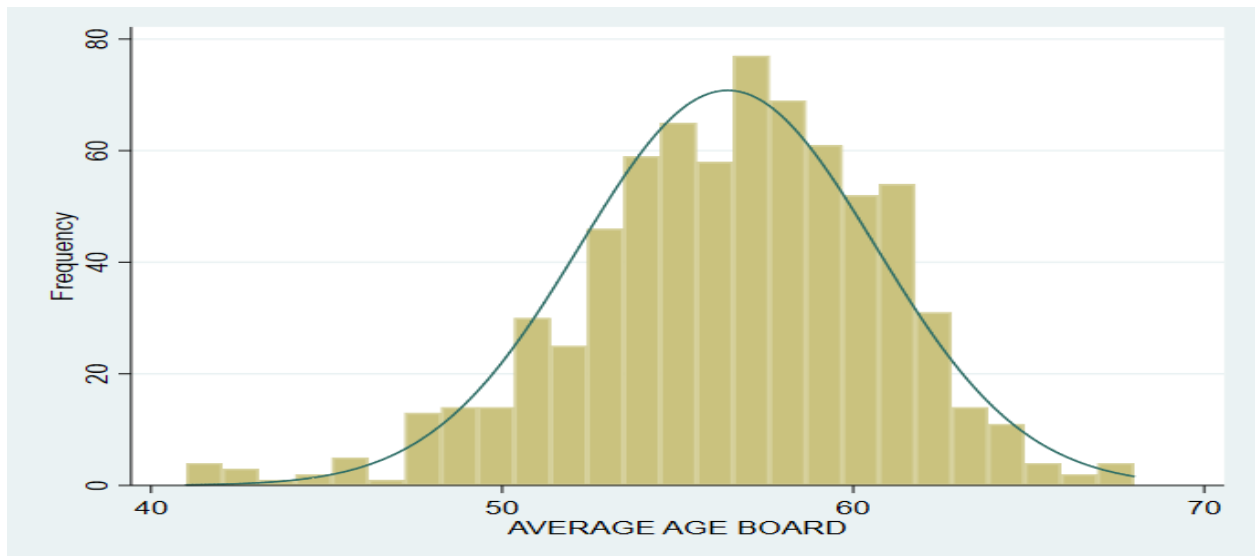


BOARD Size LN

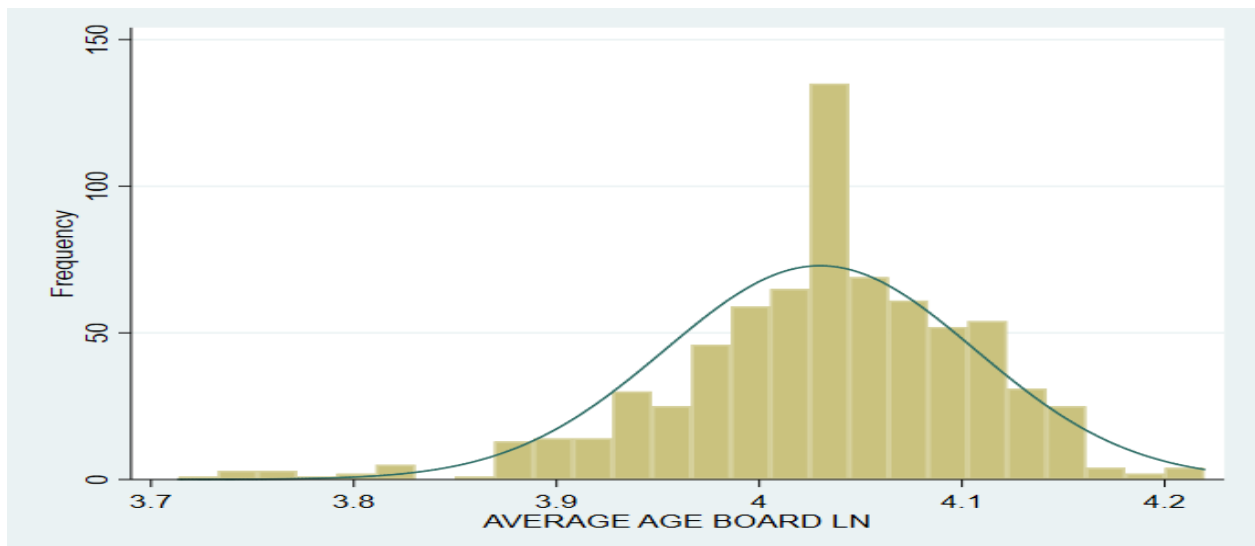


Variable	Obs	Mean	Std. Dev.	Min	Max
LN Board Size	719	1.898	0.240	1.099	2.565

AVG AGE BOARD



AVG AGE BOARD LN



Variable	Obs	Mean	Std. Dev.	Min	Max
Average Age LN	719	4.030	0.077	3.714	4.220

Appendix 2 - Heteroskedasticity

Breusch-Pagan	
Ho:	Constant Variance
Chi-squared (7)	133.32
P-Value	0.0000

Appendix 3 - Linearity

Ramsey RESET	
Ho:	Model has no omitted variables
F (3,719)	12.54
Prob > F	0.0000