Gender diversified board’s impact on firm performance and stock volatility
- A quantitative study examining Swedish, Danish and Finnish listed firms

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Abstract

Board gender diversity has been on the corporate agenda for several years, despite numerous gender diversity initiatives around the EU-Member States, women remain underrepresented in the boardroom. There is an intense debate and the problem is frequently raised and discussed by politicians, journalists, shareholders and investors.

The thesis examines if gender diversity in the boardroom has any significant effects on firm performance and stock volatility based on 318 firm-year observations with firms listed on the Stockholm Stock Exchange, Copenhagen Stock Exchange and Helsinki Stock Exchange from 2013 to 2015. The authors find no significant relationship between gender diversified board and firm performance for the overall sample at any conventional level. However, the authors find a positive and statistically significant relationship between gender diversified board and firm performance for only Swedish firms, measured by Tobin’s q. Furthermore, the empirical findings from the relationship between board gender diversity and stock volatility using 1 272 firm-quarter observations, are statistical significant and shows that firms with high gender diversified board have lower stock volatility compared to firms with low gender diversified board.

**Keywords:** Gender Equality, Board Diversity, Board Composition, Firm Performance, Stock Volatility, Socially Responsible Investment
Acknowledgments

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Gustav Johansson            Martin Westport
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Abbreviations

CAPM – Capital Asset Pricing Model
ESG – Environmental, Social and Governance
SML – Security Market Line
SRI – Socially Responsible Investing
1 Introduction

In this chapter the authors present a background and problem discussion to introduce the research topic. This is followed by the purpose of the thesis and the research question section where the major and minor research question are stated. The introduction chapter ends with delimitations and section description.

1.1 Background

The responsibilities of a gender diversified board have been on the corporate agenda for several years and the slow progress of adding more women to the boardroom has dominated the conversation. Board gender diversity is the latest in an emerging body of academic and quantitative research (Morgan Stanley, 2016). Women are successful at university and in their early careers, but they are still greatly underrepresented in the boardroom. Although boardroom diversity is increasing, women remain underrepresented and the imbalance in the boardroom remains an important challenge for all the EU Member States (European Commission, 2012). The reason behind women remain underrepresented in the boardroom can be partly related to the widely used term “glass ceiling” (Burgess and Tharenou, 2002). Glass ceiling in organizations are barriers that prevent women from advancing beyond a certain level to the senior exclusive positions (Arfken, Bellar and Helms, 2004). Women face barriers that prevent them to advance to the boardroom, which can be seen as a waste of highly qualified women and human resources (European Commission, 2012).

Dawson, Kersley and Natella (2016) did a global study with more than 3 000 firms and found that women only held 14.7% of board seats in 2015, which is an increase of 54% since 2010. In Europe, the average representation of women in the boardroom was 24.4% in 2015, an increase of 80% since 2010. Many European countries are maintaining policy on diversity in the boardroom, especially from a gender perspective, which the increasing number of women on board clearly shows. The European Union takes steps to guarantee the equality between men and women and the women’s representative in the European boardroom must give confidence that further progress will be made in a global perspective (Dawson, Kersley and Natella, 2016).
In Scandinavia, the debate about gender diversity in the boardroom has been intense over the past years. The topic is frequently raised and discussed by politicians, shareholders and journalists. Looking at a Scandinavian perspective, Norway, Sweden and Denmark have one of the highest percentages of board seats filled by women in the world (Deloitte, 2013). Among the European countries, Norway has the greatest number of gender equality in the boardroom after they became the first country to introduce board gender quotas in 2005 that requires 40 percent of both sexes on boards (Deloitte, 2013; Dawson, Kersley and Natella, 2016). The authors exclude Norway in the thesis because of the gender quota, which could give misleading outcomes.

The authors choose instead to focus on Sweden, Denmark and Finland because of the strong similarities in how the countries work to increase gender equality in the boardroom, as well as the cultural and legal aspects (Deloitte, 2013; Dawson, Kersley and Natella, 2016). There is an intense debate in Sweden, Denmark and Finland concerning the progress of adding more women to the corporate board in these countries. Sweden works actively with self-regulations instead of board gender quotas and there is a positive and sustainable trend in Sweden, which shows that the boardroom diversity increases without legalised board gender quotas (Johansson, 2016). Denmark and Finland are very similar to Sweden because both countries work with self-regulations, instead of board gender quotas. There is an increasing trend over time and Sweden, Denmark and Finland are on their way to an equal representation in the boardroom (Dawson, Kersley and Natella, 2016).

There is a growing body of research showing the benefits of a gender diversified board. Studies from various countries show that gender diversified boards have a positive impact on firm performance. Amongst these studies, Morgan Stanley’s global quantitative research team has examined gender diversified board’s impact on firm performance for over 1 600 global firms. Evidence from their analysis shows that firms with high gender diversified board have delivered better financial returns, Return on Equity (ROE), with lower stock volatility, compared to firms with low gender diversified board. Morgan Stanley’s quantitative research provides evidence that investing in firms with gender diversified board is profitable both for firms and investors (Parker et al., 2016). According to PwC (2015), more than 80% of directors
believe that board diversity has a positive impact on firm performance. However, more than 70% of directors say there are hindrances to increase the board diversity.

When women are clearly underrepresented in the boardroom, firms are missing out a wide range of talents and diversified knowledge. In general, a corporate board that are composed with both males and females directors, generates a devise set of opinions and experience that can improve the decision-making process. Different individuals have different expertise, knowledge and life experience. There exists evidence that a gender diversified board can avoid a decision-making process that could lead to unethical and unhealthy decisions for the firm (Arfken, Bellar and Helms, 2004). A gender diversified board contributes to better decision-making because of differences in preferences and risk attitudes compared to a homogenous board (Bertrand, 2011). The main idea is that gender balance in the boardroom decreases excessive risk-taking by board members and thus probability of company failure. Gender balance in the boardroom is associated with improved quality of decisions and by that means higher financial performance for the firms. Diversification in the boardroom is needed to understand and handle today’s complex business world that has become deeply interconnected (Hunt, Layton, and Prince, 2015).

There is evidence that investors take into account the firm’s board gender equality in their investment decisions and the topic is a growing social issue that continues to gain global attention (Barclays, 2014). Today, people are investing their money with the heart as well as their head and it is more than just the return on the investment that matters for the investors. Investors and asset managers are seeking to achieve positive impacts through sustainable investment strategies with an emphasis on the advancement of women. Socially responsible investing (SRI) is an investment process where the investor looks at the financial information combined with environmental, social and governance issues, where gender equality is included (EUROSIF, 2012). Within SRI, gender equality in the boardroom creates attention from a wide range investors and asset managers, to create social change, while simultaneously generating financial return for the investors. In a global perspective, trillions of dollars are actively investing under SRI strategies where the gender diversity in the boardroom have become a key criterion for investors and assets managers who want to take social responsibility and
improve their financial return at the same time (Barclays, 2014). In 2015, more than one out of every five dollars was invested according to SRI strategies under professional management in the United States, which is a total of $8.72 trillion or more (US SIF Foundation’s, 2016).

The research problem in the thesis is to investigate if gender diversified board affects firm performance for Swedish, Danish and Finnish listed firms. The authors extend previous research as they also investigate in gender diversified board’s impact on stock volatility. This makes the thesis valuable for firms, investors, policy makers and regulators. Firms strive for better firm performance and it is valuable for them to know if the gender equality in the boardroom can affect it positively. Investors take into account the social aspects, including gender equality in the boardroom, when making investment decisions. It is valuable for investors to know gender diversified board’s impact on stock volatility. Sweden, Denmark and Finland is often described as countries with high equality, but the underrepresentation of women in the boardroom remains a complex problem for regulators and policy makers. The aim of the thesis is to contribute a better understanding of this complex problem in this geographic region that regulators and policy makers hopefully can use in their future decisions on regulations. This makes the region particularly interesting for empirical testing on gender diversified board’s impact on firm performance and stock volatility.

1.2 Problem Discussion

Previous studies that have examined the relationship among gender diversified board and firm performance show inconclusive results. Researchers have found both positive, negative and no relationship between gender diversified board and firm performance. A study by Carter, Simkins, and Simpson (2003) that examined the relationship among gender diversified board’s impact on firm performance found a positive relationship. Based on the data from Fortune 1000, the study found a significant positive relation between gender diversified board and performance measured by Tobin’s q. Adams and Fierra (2009) found a negative relationship between gender diversified boards and firm performance for firms in the United States, with firm performance measured by both Tobin’s q and Return on Assets. Contrary to a number of other studies, Rose (2007)
investigated in the same relationship in Denmark, but found no significant relationship between gender diversified board and firm performance measured by Tobin’s q.

There are number of possible explanations for the inconclusive empirical results. First, the studies are conducted in different countries and time periods. The different relationship among gender diversity and firm performance might depend on which time period examined together with the cultural aspect with the difference in legal context. Second, the empirical testing of gender diversified board’s impact on firm performance is a methodological challenge for the authors in this research area. It is important to remember that different studies use different regression models and use different dependent variables to measure firm performance.

The authors manage these challenges in several ways to get as robust results as possible. First, the authors use panel data in the thesis and examine a recent and relative short time frame, 2013-2015. The use of panel data instead of cross-sectional data increases the number of observations, which brings more robust outcomes (Gujarati and Porter, 2009, p. 592). Second, the study is conducted with data from three different countries, Sweden, Denmark and Finland, with strong similarities among the culture and legal aspects (Deloitte, 2013; Dawson, Kersley and Natella, 2016). Third, the authors based their regression models on previous studies and used three different dependent variables that all measure firm performance, ROE, ROA and Tobin’s q, to find significant relationships among the variables.

1.3 Purpose

The purpose of the thesis is to provide empirical evidence on gender diversified board’s impact on firm performance and stock volatility for Swedish, Danish and Finnish listed firms. The combination of gender diversified board’s impact on firm performance and stock volatility makes the thesis valuable for firms, investors, policy makers and regulators.

The interest in analysing gender diversified board’s impact on firm performance is confirmed by studies conducted by both researchers and industry reports (Adams and Fierra, 2009; Carter, Simkins and Simpson, 2003; Reguera-Alvarado, Fuentes and
Laffarga, 2017; Liu, Wei and Xie, 2014). The authors argue that the research will bring valuable insight into the important topic and provide knowledge and evidence to the debate of gender diversified board. The ambition of the authors is that the results will contribute to more firms with gender diversified board in the future.

1.3.1 Research Questions
The authors use two research questions for the thesis. The major research question, which is the main focus in the thesis, is to examine the relationship between gender diversified board and firm performance using data from Swedish, Danish and Finnish firms. The minor research question focus on the gender diversified board’s impact on stock volatility, where firms with high gender diversified board are compared to firm with low gender diversified board.

Major research question:
Does number of women on board affect firm performance for Swedish, Danish and Finnish listed firms?

Minor research question:
Is the stock volatility for Swedish, Danish and Finnish listed firms with high gender diversified board different compared to firms with low gender diversified board?

1.4 Delimitations
The research area of the thesis is delimited to Swedish, Danish and Finnish listed firms. The reason why the thesis is delimited to only listed firms is due to the limited time frame where the authors try to be as efficient as possible. The authors are delimited by the available data on number of women on board. The authors include both available data on number of women on board from a database and manually collect data from firms’ annual reports. The majority of the data is collected using a database to be as time efficient as possible.
1.5 Section Description

The Introduction chapter is the first section of the thesis where the authors present the background to the research topic. The authors also include a problem discussion where previous studies are discussed in order to provide the reader deeper insight in what has been examined in this field. It is followed by the purpose of the thesis, which includes the research questions to provide the reader insight what will be examined in the thesis. The introduction chapter ends with delimitations of the thesis. The second chapter is the Research Methodology where the authors explain how they conduct the research, which is the link between the research question and results. The third chapter is the Theoretical Framework, where the authors present existing theories and empirical literature that are relevant to the research problem. The fourth chapter is the Empirical Methods, where the authors present the data and the empirical models, both the primary equations and the additional equation. In the fifth chapter the authors present the Empirical Results from both the primary and additional equations. The authors present the descriptive statistics, Pearson correlation between the variables, model summary and coefficients for both the equations. In the sixth chapter Analysis, the authors answer the research questions after they analysed and interpreted the empirical results. Finally, the analysis of the empirical results serve as the base of the conclusion and lead up to a Conclusion, in the seventh chapter, that also includes limitations and finally suggestion on further research in this field.

Figure 1.1 Chapter Outline
2 Research Methodology

In this chapter the authors present the choice of research methodology. The chapter includes a presentation of the authors’ prerequisites, research approach, research philosophy, research strategy, research design, choices of perspectives and research ethics.

2.1 Authors’ Prerequisites

The two authors of the bachelor thesis are third year students on the Business Administration and Economics Programme at Linnaeus University, Sweden.

The authors share the same international background of exchange studies during their fifth semester at Thammasat University, Thailand. The courses during the exchange studies were important in order to expand their business education at an international level. Both students have taken accounting and investment courses in order to improve their knowledge in business administration and finance.

The authors have a genuine interest in the financial markets with a focus on investments and therefore it came naturally to investigate in board gender diversified impact on firm performance and stock volatility. The genuine interest will appear on the commitment and efforts the authors spend on the bachelor thesis.

2.2 Research Approach

There are mainly two different research approaches to use when drawing a conclusion, the deductive and inductive approach. The authors decide whether their research should use the deductive approach, where the authors develop a hypothesis and a research strategy based on existing theory or the inductive approach where the authors collect data and develop research strategy as a results on the data analysis (Saunders, Lewis and Thornhill, 2009, p. 124).

The deductive approach is concerned with developing a hypothesis based on existing theory and then designing a research strategy and guide the process of collecting data so the hypothesis can be tested (Bryman, 2012, p. 24). The deductive approach is
associated with quantitative research with numeric data (Bryman, 2012, p. 25). The approach is a highly structured approach that requires the selected sample to be big enough in order to explain the relationship between the variables and draw a conclusion on the quantitative data (Saunders, Lewis and Thornhill, 2009, p. 127).

The other research approach for the relationship between theory and research is the inductive approach. The inductive approach involves drawing inferences out of observations to generate a theory by observing the relationship between theory and research (Bryman, 2012, p. 26). The inductive approach is typically associated with qualitative research approach as the link between data and theory (Bryman, 2012, p. 27).

The authors use the deductive approach in the thesis to construct the relationship between the theory of gender diversified board’s impact on firm performance and stock volatility, and the research. The motivation for choosing the deductive approach is to develop a hypothesis based on existing theories to examine gender diversified board’s impact on firm performance and stock volatility using quantitative data. It is therefore suitable to choose the deductive research approach in the thesis, since the theory guides and the research process appears in a linear way, with one step follow the other in a clear and logical way. The deductive approach is used in previous studies examining gender diversified board’s impact on firm performance (Adams and Fierra, 2009; Reguera-Alvarado, Fuentes and Laffarga, 2017). An inductive approach is not preferable since the authors use a quantitative research strategy. The authors do not find it suitable to generate a theory by observing relationship between theory and research in the thesis.

2.3 Research Philosophy

Quantitative and qualitative researches constitute different philosophical points, the important epistemological and ontological considerations. Epistemological consideration is an important part of the research strategy. To a large extent, these revolve around the desirability of employing positivism versus interpretivism. Another important dimension of the quantitative/qualitative contrast is the ontological considerations, concerning objectivism versus constructivism (Bryman, 2012, p. 42).
The research philosophy the authors choose in the thesis contains important assumptions about the way the world looks like and these assumptions will support the research strategy and the methods used in the thesis. For business researches it is important to be aware of the philosophical commitments, since the choice of research strategy has significant impact on the work and the understanding on what the authors investigate in (Saunders, Lewis and Thornhill, 2009, p. 108).

2.3.1 Epistemological Considerations
An epistemological problem consists of what should be taken into account as acceptable knowledge in a discipline. A central problem in this context is if the social world should be studied under the same principles, procedures and ethos as the natural science (Bryman, 2012, p. 27). The three main epistemological positions are positivism, interpretivism and realism.

Positivism is an epistemological position that is based on natural science. It supports the application of the natural sciences to the study of social reality and beyond. Positivism follows principles such as only phenomena and knowledge confirmed by the senses should be qualified as real knowledge (Bryman, 2012, p. 28). In quantitative research, positivism is used as the epistemological position (Bryman, 2012, p. 36).

Interpretivism is an alternative to positivism that integrates human interest into a study based on the critique of positivism. Interpretivism focus on people instead of objects and humans can been as social actors that have an important role (Bryman, 2012, p. 30).

Realism argues that there are real underlying causes, structures, processes and entities that give rise to the observations people make of the world, natural and social. There are two major forms of realism: empirical realism and critical realism. Realism is an epistemological position that is similar to positivism because of the social approach (Bryman, 2012, p. 29).

Based on this consideration, the authors choose positivism as the epistemology. The nature science model of positivism in particular represents a view of social reality as an
external, objective reality. Positivism is linked to the quantitative research strategy with a deductive research approach (Bryman, 2012, p. 36). To be able to examine gender diversified board’s impact on firm performance and stock volatility, positivism is the most appropriate research philosophy. Positivism can handle and measure quantitative data that is highly structured, which is suitable for the authors to be able to answer the research questions (Saunders, Lewis & Thornhill, 2009, p. 119). Interpretivism is not suitable in the thesis because the authors use a quantitative research strategy, where the authors would need to collect primary data (Bryman, 2012, p. 36). Realism is not suitable because it says that there is a difference between the reality and the authors’ description of it (Bryman, 2012, p. 29).

2.3.2 Ontological Considerations

Ontology is associated with a central question of whether social entities can and should be considered as objectivism entities or constructive entities. Ontology are concerned with the nature of social entities. The two different ontological positions are objectivism and constructionism. The main difference between the positions can be explained by the social science terms: organization and culture (Bryman, 2012, p. 32).

Objectivism is an ontological position that implies that social phenomena and their meanings have an existence that is independent of social actors. These social phenomena are used in daily disclosure, which characterize the more classical way. The organization can be seen as a tangible object, with a hierarchy where rules and regulations and standardized procedures are used for getting things done. In objectivism, the social identity in question appears as something external to the actor in the organization and culture.

Constructionism is considered as the alternative ontological position, with the aspect that the social phenomena are not only built through social interactions but also that they are in constant state of revision. In contradistinction to objectivism, the organization and culture in constructionism are pre-given and therefore confront social actors as external realities that they have no role to construct. Social actors in question can have different views and interpretations of existing situations (Bryman, 2012, p. 33).
Based on these considerations, the ontological consideration in the thesis is an objectivism view due to the nature of quantitative research strategy. The gender diversified board’s impact on firm performance and stock volatility is analysed using a quantitative data strategy so objectivism is the most suitable ontological consideration. The objectivism characteristics of having and demonstrate a view of social reality as an external, objective reality (Bryman, 2012, p. 33).

2.4 Research Strategy

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Table 2.1 Differences between Quantitative and Qualitative Research Strategy

There are two research strategies to distinguish, quantitative research strategy and qualitative research strategy. Quantitative research strategy is a research strategy that emphasizes quantification in the collection and analysis of data. Table 2.1 shows that a quantitative research strategy uses the deductive approach as research approach, positivism as the epistemological position and objectivism as the ontological consideration. Before the quantitative data has been processed and analysed, it is not meaningful for most people. The raw quantitative data needs to be processed to make the data into useful information. Descriptive statistics help the authors to present and interpret the data (Saunders, Lewis and Thornhill, 2009, p. 414). Descriptive statistics enables to describe and compare variables numerically (Saunders, Lewis and Thornhill, 2009, p. 444). The authors test the relationship between variables occurring using significant testing (Saunders, Lewis and Thornhill, 2009, p. 450).

Qualitative research strategy is a strategy that is more concerned by words rather than numerical data. Table 2.1 shows that a qualitative research strategy uses the inductive approach as research approach, interpretivism as the epistemological position and
constructionism as the ontological consideration. To be able to use the qualitative research strategy, the authors need to interview firms to collect data. This can be extremely time consuming to conduct (Bryman 2012, p. 311). The authors have neither the time nor the financial resources to conduct an extensive research, which is required for the bachelor thesis. The authors use secondary analysis of data that has been collected by well-known institutes to provide reliability and validity data.

The authors use a quantitative research strategy, where data is collected and analysed using multiple regression models, which is the most appropriate method to use in this type of research. The choice of model is discussed further in Section 4.3. It is possible for the authors to use a qualitative research strategy, even if it is not the most optimal strategy in the thesis. A qualitative research strategy is a time consuming process, where the authors have to collect data by interviewing firms. It can affect the sample size negatively. Qualitative research is a strategy that are using words rather than numbers and is often used to describe theories instead of testing the theories as in the quantitative research (Bryman, 2012, p. 45-46). The reasons for the authors’ choice are that a quantitative research strategy is the most optimal strategy and is the most frequent research strategy in previous studies (Adams and Fierra, 2009; Carter, Simkins and Simpson, 2003; Parker et al., 2016; Reguera-Alvarado, Fuentes and Laffarga, 2017)

2.5 Research Design

The decision to adopt the quantitative research strategy gives the authors a broad orientation of the research but the decision concerning the research design is not determined. Deciding which type of research design to use in the thesis, the attention is on the different frameworks for the collection and analysis of data. The choice of research design reflects decisions about the priority of a range of dimensions of the research process (Bryman, 2012, p. 45-46). The authors’ choice of longitudinal design is closely related to quantitative research where the data is collected and analysed over different time periods. There are two types of longitudinal design, the panel study and the cohort study. The panel data often includes a sample at national level with a focus on at least two occasion with data collected from either firms, people or households. A cohort study includes a sample of either an entire cohort of people or a random sample of them, for example include people with a certain characteristic. Panel and Charhart
have similar design structure as data are collected over at least two points of time on the same variables with the same sample (Bryman, 2012, p. 63-65).

The authors choose the panel study design that investigates in the relationship between gender diversified board and firm performance and stock volatility over time. The use of panel data design in the thesis is suitable to be able to answer the thesis research questions. The first advantages of longitudinal design are the use of panel data includes a bigger sample than the cross-sectional data that is conducted over onetime period. Panel data with a bigger sample with more observations, brings a more robust outcome (Gujarati and Porter, 2009, p. 592). The second advantages of the choice of the longitudinal design with the panel study is that a panel study, that takes place over many years and can distinguish effects over time which is suitable when investigating on the gender diversified board’s impact on firm performance and stock volatility.

When the authors conduct a panel study with multiple variables over time it is to pay attention on the reliability and validity of measurements for assessing the quality of the research. Measurement errors is the degree to which the observe values not representative the correct values. The authors aim to reducing measurement errors by address to important the validity and reliability (Hair et al., 2009, p. 7). Validity is the degree to which a measure accurately represents what it is supposed to. Ensuring validity is about to understand what will be measured and making the measurement as accurate as possible (Hair et al., 2009, p. 7). Reliability of the measurement is the degree to which the observed variables measures the correct value that are free from error. The authors try to use the same measurements repeatedly, for more reliable measures to show consistency for the reader (Hair et al., 2009, p. 8). The authors evaluate variables that have been used in previous studies to choose variable with the highest reliability for the thesis.

2.6 Choices of Perspectives

The authors use two perspectives for the thesis. The first one is from the firm perspective, where gender diversified board’s impact on firm performance is analysed. The second one is from the investor perspective, where gender diversified board’s impact on stock volatility is analysed. The two perspectives the authors have chosen to
use make the analysis of the thesis more valuable in a wider perspective, both for firms and for investors.

2.7 Research Ethics

This section deals with the ethical concerns that might arise conducting research study in the context of collecting and analysing data. Ethical principles can be divided into four main areas. The principles are (1) harm to participants, (2) lack of informed consent, (3) invasion of privacy and (4) deception. These principles are more relevant for a qualitative research strategy (Bryman, 2012, p. 135).

The ethical issues in quantitative research strategies cannot be completely ignored, since it is directly related to the integrity of the research. The quantitative research strategy, involves concern about the activities in the research process, which should or should not be included with regard to the participants’ ethical perspective. The authors also ensure that firms can be confident that their privacy will not be violated. The data will be analysed and presented as a sample, which means that data for specific firms will not be stated. All firms in the sample are listed, so the authors use data that is already available for the public (Bryman, 2012, p. 154).
3 Theoretical Framework

*In this chapter the authors present the theoretical framework. The chapter includes a presentation of board of director’s duties and responsibilities, board structure, rationale for gender differences, gender diversified board, change in the boardroom and investor’s perspective of board composition. The chapter also include relevant theories behind the regression models used in the thesis and ends up with the development of the hypotheses.*

3.1 Board of director’s responsibilities, roles and functions

The firm’s board of directors are responsible for ensuring that a corporate board is meeting the objectives of stakeholders as well as developing business strategies to prosper in the future. The board serves number of roles, one of them is to select and appointing a CEO who is in charge and responsible for the administration of the organization. Another one is to provide continuity for the organization and establish corporate management policies and to make decisions on major firm issues (Arfken, Bellar and Helms, 2004). One of the board’s most important functions is to deal with strategic choices and take decisions about the recommendations from the management about the future direction of the firm (Wommack, 1979).

Increased scrutiny from investors, stakeholders and regulators has affected changes in priorities and focus areas in the boardroom. The corporate board focuses on the areas that have impact on long term shareholder value, such as strategy, monitoring risk and participate in educational programs to stay updated on the latest governance developments (PwC, 2015).

Directors on the board focus on overseeing firm strategy and overseeing risk. The firm strategy takes into account economic, environmental micro and macro trends, as well as new technological macro trends to manage the long-term strategy. The board are also responsible for overseeing risk and to detecting fraud. Today’s trend shows that directors in the boardroom have become more competent in this area and have taken concrete actions to handle the overseeing risk to avoid fraud (PwC, 2015).
3.2 Board Structure

There are in general two different board structures, the one-tier and two-tier board structure. The major differences between the two models are the structure, compositions and the role of the boards (Block and Gerstner, 2016). In the European Union, eight countries use the one-tier board structure and ten countries use the two-tier board structure as the corporate governance system. The remaining nine countries can choose between the one-tier or two-tier approach (European Commission, 2013).

One-tier board structure is a single board structure where all the directors, both executive directors and non-executive directors are included. The one-tier board structure has only one board instead of two separate ones and the advantage of this board structure is that the firms have more frequent board meetings. This allows more integrated business strategy and decision-making between the directors and management (Block and Gerstner, 2016). The corporate governance system in Sweden follows a one-tier board system characterised by a single board of directors.

Two-tier board structure has a clear separation of duties between the management and supervisory functions. The clear separation between the boards means that it is forbidden that an individual is member on both boards at same time (Davies and Hopt, 2013). The management board is responsible for running the firm’s day-to-day basis and acting independently in their decision-making. The supervisory board is not involved in the day-to-day business. The members in the supervisory board are designed to ensure a certain degree of independence of the board members. The management board only contains executive directors, while the supervisory board eliminate the executive directors (Ringe, 2016).

The clear separation between the two functions in the two-tier board structure is supposed to produce more objective monitoring and is less likely to be biased and the composition of the supervisory board benefits from external input from representatives from other firms, accounting firms and banks that bring different knowledge and expertise around the table (Ringe, 2016). The corporate governance system in Denmark follows the two-tier board system, characterised by both a supervisory board and a
management board. The corporate governance system in Finland allows both the one-tier and two-tier board structure.

3.3 Rationale for gender differences

The gender socialization theory implies that genders have different characteristics, which lead to different behavior between males and females (Mason and Mudrack, 1966). The previous studies focus on the difference between males and females in behavior and characteristics to determine whether the gender matters and differs in specific situations. The areas that have been investigated in previous literature are the difference in risk aversion and moral and ethical principles (Schubert et al., 1999; Adams, Tashchian and Shore, 2001; Roxas and Stoneback, 2004).

The general view concerning financial decision-making is that females are more risk averse and have higher moral and ethical principles (Schubert et al., 1999). Any difference in characteristics and behavior can affect the quality of decision-makings taken by male and female directors on the board. The gender stereotypes above concerning the risk aversion and the moral and ethical principles of males and females have been well researched over the years.

Studies on gender differences have been popular for researchers to investigate in. Previous studies that investigate in different characteristics and behavior between males and females have focus on the risk aspect and ethical decision-making. The risk aspects together with the ethical and moral principles are particular interesting for the authors in the thesis.

People who are less willing to take risk are often described as risk averse and the gender stereotype is that females are more risk averse than males (Schubert et al., 1999). If female directors are more risk averse than male directors, it is possible that greater board diversity can lead to less risky corporate decision-making.

The ethical decision-making that occurs in firms involves employees’ evaluations of different questionable business decision with an ethical aspect that may affect the firm’s performance. The ethical decision can be based on individual’s ethical values, attitudes
and awareness of the business ethics based on the existing firm code (Adams, Tashchian and Shore, 2001).

There are number of studies that have examined the impact of gender on the ethical decision-making. Some empirical examinations found evidence that females tend to be more ethical than males at work. Roxas and Stoneback (2004) empirical results show overall that females are more ethical than males but it appeared that there is difference on ethical decision-making across the investigated countries.

3.4 Gender diversified board and findings from previous studies

A gender diversified board is a board that has a composition of both male and female directors. It can affect the firm in different ways, which has been proven in previous studies. Previous studies argue how a gender diversified board could be more desirable in different ways for firms.

In a rapidly changing business climate, a high-performing board that is open to innovation is required for the firms to survive the changes. The focus on board composition on gender diversity has been on the corporate agenda and it continues to grow (Hunt, Layton, and Prince, 2015). The board composition is under pressure to develop. In order to be well positioned on the market and to create long term value, the board needs to have the right expertise and experience, which includes a composition of both male and female directors (PwC, 2015). Investors and other stakeholders require more information about a firm’s director nominees. They especially require information regarding board gender diversity and how they actively work with the diversity approach. This is occurring in an environment where the shareholders are active and critical (PwC, 2016).

In general, a gender diversified board generates a diverse set of opinions and experiences that impact and improve the decision-making process (Bernardi and Threadgill, 2010). A gender diversified board can avoid a decision-making process that could lead to unhealthy and possibly unethical decisions, where the decision-makers share similar characteristics (Arfken, Bellar and Helms, 2004). Akaah (1989) study found that there exists a difference between males’ and females’ moral reasoning,
which entail that the way men and women handle ethical decision-making differ. If there are more female directors in the boardroom that take greater responsibility and are concerned about the ethical decision-making, the firm will be less likely to take actions that are considered as unethical and unhealthy.

<table>
<thead>
<tr>
<th>Article</th>
<th>Sample</th>
<th>Dependent variable</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reguera-Alvarado, Fuentes and Laffarga (2017)</td>
<td>Spanish firms</td>
<td>Tobin’s q</td>
<td>Positive effect</td>
</tr>
<tr>
<td>Carter, Simkins and Simpson (2003)</td>
<td>US firms</td>
<td>Tobin’s q</td>
<td>Positive effect</td>
</tr>
<tr>
<td>Liu, Wei and Xie (2014)</td>
<td>Chinese firms</td>
<td>ROA</td>
<td>Positive effect</td>
</tr>
<tr>
<td>Parker et al., (2016)</td>
<td>Global firms</td>
<td>ROE</td>
<td>Positive effect</td>
</tr>
<tr>
<td>Adams and Fierra (2009)</td>
<td>US firms</td>
<td>Tobin’s q and ROA</td>
<td>Negative effect</td>
</tr>
<tr>
<td>Rose (2007)</td>
<td>Danish firms</td>
<td>Tobin’s q</td>
<td>No effect</td>
</tr>
</tbody>
</table>

Table 3.1 Summary of previous studies

The previous studies are summarized in Table 3.1, where the authors show the sample, dependent variable and the effect of six studies. Reguera-Alvarado, Fuentes and Laffarga (2017) found a positive and significant relationship between gender diversified boards and firm performance measured by Tobin’s q. The sample consisted of Spanish firms over the time period 2005 to 2009. Spain was the second country in the world to require board gender quotas for firms, which has increased the number of women on board by 98%. Carter, Simkins and Simpson (2003) examined gender diversified board’s impact on firm performance measured by Tobin’s q and found a positive and significant relationship. The evidence is from Fortune 1000, which includes the 1 000 largest firms in the United States based on their revenue. Liu, Wei and Xie (2014) found a positive relationship between gender diversified boards and firm performance measured by Return on Assets for Chinese listed firms. Gender diversified boards improved the communication and previous weak governance as well.
Adams and Fierra (2009) found a negative relationship between gender diversified boards and firm performance measured by Tobin’s q and Return on Assets for firms in the United States. The authors also found other relevant relationships associating with the number of women on board. The authors found that female directors have a significant and value-relevant impact on the board structure. Female directors have better attendance records compared to male directors. Females’ better attendance records indicate that a gender diversified board have better attendance, which can have impact on the commitment and involvement among the board of directors. The commitment and involvement among the directors have direct impact on the decision quality that are value relevant for the firms. The authors also found that female directors are more likely to join monitoring committees.

Unlike previous studies, Rose (2007) found no significant relationship between gender diversified boards and firm performance measured by Tobin’s q. Women only represented 4 percent of the board of directors. The evidence is from Danish firms during the time period 1998 to 2001.

3.5 Investor’s perspective of board composition

Corporate ethical and financial scandals as Enron and WorldCom, have increased scrutiny from investors, stakeholders and regulators. Today, firms face increased pressure and oversight from investors and regulators. Board duties are now critical important as ethical and legal responsibilities, which influence the board’s decision-making (Arfken, Bellar and Helms, 2004). Board diversity is discussed more often in financial press and as awareness grows, investors are beginning to become engaged directly with firms to promote for greater gender diversity (Barclays, 2014).

Socially responsible investing (SRI) is an investment process where the investor takes into account the ESG factors - environmental, social and governance (EUROSIF, 2012). The composition of the board is relevant as a governance factor for an investor using this strategy. This makes SRI relevant for investors that believe that gender diversified board is an important factor. SRI is a strategy that has changed its idea over time. Before, it mostly meant that an investor should try to avoid investing in controversial industries such as tobacco, alcohol or gambling industries. Nowadays, the
importance of environmental, social and governance (ESG) factors has changed the meaning of SRI (The Wall Street Journal, 2016). Investors focus instead on the ESG issue with a gender diversified approach to see the effect on firm and portfolio performance (Morgan Stanley, 2016).

A study by Parker et al., (2016) shows that high gender diversified firms have delivered better firm performance, measured by Return on Equity, compared to firms with low gender diversified board. In addition, the study also found that investing in firms with high gender diversified board had lower volatility. This analysis shows that gender diversified firms have outperformed the average over the years 2011-2016.

### 3.6 Research Setting

There exists a wide gap between the propositions of women in the boardroom among the EU Member States (European Commission, 2012). Across the EU Member states, both legislative and voluntary initiatives have been developed to address the wide gap among the countries. Legislative measures are considering the target quotas for gender representation on boards. Voluntary initiatives are for instance corporate governance codes and indicatives as to promote gender equality in the boardroom for stated-owned firms. Sweden, Denmark and Finland work with self-regulations, with different voluntary initiatives (European Commission, 2012).

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>28.90%</td>
<td>27.80%</td>
<td>27.30%</td>
<td>30.30%</td>
<td>28.20%</td>
<td>33.60%</td>
</tr>
<tr>
<td>Denmark</td>
<td>16.90%</td>
<td>18.20%</td>
<td>20.60%</td>
<td>25.00%</td>
<td>23.50%</td>
<td>28.50%</td>
</tr>
<tr>
<td>Finland</td>
<td>26.40%</td>
<td>24.50%</td>
<td>27.00%</td>
<td>29.50%</td>
<td>28.00%</td>
<td>29.20%</td>
</tr>
</tbody>
</table>

Table 3.2 Percentage of women on boards by country
Source: Credit Suisse Research – sample size 27 000 directors

Table 3.2 describes the percentage of women on boards for Sweden, Denmark and Finland between 2010-2015. In 2015, women represented at least 28.5% of the seats in the boardroom in these countries, which means that all three countries are in the top of women’s representation in the boardroom among the EU Member States. The authors
present a more accurate description of the progress and the initiatives taken by the countries to promote gender balance in boardroom below.

3.6.1 Sweden
In Sweden, the debate about gender equality in the boardroom has been intense over the past years. The topic is frequently raised and discussed by politicians, shareholders and journalists. The question about implementing a board gender quota has been a proposal but has not been implemented because the majority in the Swedish government did not support the proposal. A number of revision rules were implemented in 2015 to improve the gender balance of listed firms’ board of directors, for now these initiatives are based on a self-regulation policy (Deloitte, 2013). In 2016, the Swedish government announced a proposing legislation for board gender quotas on the corporate boards. The bill contains that by 2019, women have to represent at least 40 percent of the members of the board otherwise firms will be fined (Svenska Dagbladet, 2016). Sweden’s minority government was forced to drop the planned bill after faced defeat after the opposition parliament majority formed against it (Dagens Nyheter, 2017).

Allbright (2016) show that the firms listed on the Large Cap, which includes the largest Swedish listed firms, have the most equal representation in both the management and the board. Firms in Sweden have understood the potential of searching among all available skills, and the firms listed on the Large Cap in Sweden have the best success in attracting female directors to the boardroom compare to firms listed on Mid Cap and Small Cap.

Today, one third of Swedish firms have a gender diversified board and the time has shown that the trend is sustainable. Sweden appears to be the first country to achieve gender equality in the boardroom without quotas. The threat of quota from the government had a positive effect on how the Swedish firms have tackle the gender issue in the board (Svenska Dagbladet, 2017).

3.6.2 Denmark
Gender equality in the boardroom continues to be a focus area. Since 2013, corporations in Denmark are required to work actively towards gender equality. Danish
boards are required to set targets for underrepresented gender in the boardroom, and the corporations are required, in their annual reports or in their website, to provide status on the progress towards achieving gender equality in the boardroom, as well as the achieving gender equality in the broader management structure. These requirements apply to public listed firms, large non-listed firms and firms owned by the government (Deloitte, 2013). Denmark have for several years been in the top among European countries with high gender diversified boards, even though Denmark not have used any legislated quotas.

3.6.3 Finland

The Finnish government has considered if quotas is needed, but the general view in Finland is that the current self-regulation is the best way to go to promote female representation on boards and works better than board gender quotas. The Finnish government works with self-regulations and recommends the listed firms to have both male and female representatives in the board. Firms not meeting this requirement need to have a further explanation and disclose the reasons behind it. This initiative from the government is called “Finnish corporate governance code” (Deloitte, 2013). The self-regulation approach that is used in Finland to support female representatives have attract international attention and Representatives of Finland Chamber of Commerce have present on the subject at several international events (The Finland Chamber of Commerce, 2014).

The number of women representative in Finland have been in the European top level for several years, even though Finland have not used any legislated quotas. The achievement is to a large extent due to the self-regulatory action and the numbers of women representative on board are gradually improved and the time have shown that the trend is sustainable (The Finland Chamber of Commerce, 2014).

3.7 Capital Asset Pricing Model

The authors us the Capital Asset Pricing Model (CAMP) as a theoretical background to explain the relation among the market return, company return and firms board gender diversity. The theoretical background of CAMP is closely connected to the use of the single index model that is used in the thesis to be able to measure firm’s stock volatility
CAPM is a centrepiece of modern financial economics and was developed by William Sharpe, John Lintner and Jan Mossin in 1964 based on Harry Markowitz work 12 years earlier in modern portfolio management. Sharpe was the first person who was able to determine that there is a relationship between risk and return of a combined portfolio of risk free and risk bearing assets (Sharpe, 1964). The CAPM is widely used to give a prediction of the relationship between the risk of an asset and its expected return. The model shows the relationship between the return on the market and the return on the stocks. The coefficient of the Market Premium (Beta) shows how the stocks move with the market. The model serves two main functions. First, it provides a benchmark rate of return for evaluating possible investments to analysing investments and seeing whether the expected return is a fair return given the specific risk. Second, the CAPM is used as a benchmark to make a qualified guess as to the expected return on stocks that are not yet traded on a marketplace (Bodie et al., 2014, p. 290).

**Summary of the assumptions that lead to the basic version of CAPM:**
1. Investors are price-takers and it is unusual perfect competition on the market.
2. All investors plan for one identical holding period.
3. Investments are limited to a universe of publicly traded financial assets.
4. Investors do not pay any taxes on returns or any transactions cost on trades in securities.
5. All investors choose to hold Markowitz optimal selection portfolio.
6. Homogeneous expectations and beliefs among investors.
(Bodie et al., 2014, p. 291)

The Basic Capital Asset Pricing Model:

\[ E(r_i) = rf + \beta_i (E(r_m)-rf) \]

Where,

- \( E(r_i) \) = Expected return on asset
- \( rf \) = Risk free rate of return
- \( \beta_i \) = Beta of the asset
- \( E(r_m) \) = Expected market rate of return
There are two types of risks involved with investments: systematic and unsystematic risk. The unsystematic risk can be removed through diversification, but the systematic risk cannot be diversified away since it is the market risk. CAPM shows the systematic risk of an asset with its beta and is an important measurement to handle the risk (Bodie et al., 2014, p. 303).

CAPM has endured some criticism over the years despite its recognized establishment in the financial theoretical field. The model does not explain how the market works in practice, either because the underlying assumptions are unrealistic or problematic in practical application (Fama and French, 2004). The CAPM model can be modified to a single index model (Bodie et al., 2014, p. 257).

### 3.8 Single Index Model

The authors use the single index model as the additional model to see if there are any differences in stock volatility for firms with high gender diversified board compared to firms with low gender diversified board. The single index model is similar to the CAPM. The risk-free rate is moved to the dependent variable. It changes to expected return minus risk-free rate, $E(r_i) - rf$, instead of just expected return, $E(r_i)$. The model also includes alpha, which is an intercept of the model. It is the stock’s expected excess return, when the market excess return is zero. It is possible to make a regression analysis of the model, because the intercept is estimated. The intercept, risk-free rate, of the CAPM cannot be used as an intercept when making a regression analysis. That is the reason why the Single Index Model is used to make the regression (Bodie et al., 2014, p. 257).

$$E(r_i) - rf = \alpha_i + \beta_i (E(rm) - rf)$$

The authors analyse the beta coefficient for the firms to see if there are differences in stock volatility between firms with high gender diversified board and low gender diversified board. Beta is a statistical measure of the volatility of a stock versus the overall market and is the key component for the CAPM. Beta is an important metric in modern portfolio theory and it is generally used as both measure the systematic risk and to measure the performance. The market is described as having a beta of 1. The beta for
a specific stock describes how much the stock price moves in relation to the market. If the stock has a beta above 1, it is more volatile than the overall market. If the beta is below 1, the stock has lower volatility than the market. Stocks with lower beta are less volatile and do not carry as much risk, but generally provide less opportunity for a higher return.

\[
\beta_i = \frac{COV(R_i, R_m)}{\sigma_m^2}
\]

The beta coefficient equals the covariance between the expected return for stocks to the return of market divided by the variance of the market (Bodie et al., 2014, p. 292). The authors estimate the beta coefficient using statistical software, so the authors do not use the equation above.

Figure 3.1 Security Market Line
Source: Bodie et al., (2014, p. 298)

Figure 3.2 shows the security market line (SML) that describes the relationship between the expected return and the beta graphically. Stocks with more volatility lie to the right in the figure and stocks with less volatility lie to the left in the figure. In a market equilibrium, which is an assumption of CAPM, all securities must lie on the SML.
3.9 Hypotheses Development

The authors state two hypotheses. The authors argue that a gender diversified board can affect firm performance positively. This has been proven for different markets in previous studies (Reguera-Alvarado, Fuentes and Laffarga, 2017; Carter, Simkins and Simpson, 2003; Liu, Wei and Xie 2014). The authors’ main argument is that a gender diversified board enhances the quality of decision-making and improve the corporate governance and ethics in the boardroom. A successful board needs creativity and innovation of the directors by adding complementary skills, knowledge, and life experiences to the boardroom. A gender diversified board contributes to better firm performance because decisions are based on evaluation more alternatives compared to a homogenous board (Hunt, Layton, and Prince, 2015).

The authors argue that firms with a high gender diversified board have lower volatility in stock prices compared to firms with low gender diversified board. The authors’ main argument is that previous studies have shown the quality of ethical and moral behaviour is high with a gender diversified board. The moral and ethical behaviour among the directors in the boardroom affect the firm’s decision quality and reduces the possibility that the firm will end up in small as large corporate scandals affecting the volatility of the stock. A study by Parker et al. (2016) proved that the stock volatility was lower for firms with a high gender diversified board compared to firms with a low gender diversified board. A study by Schubert et al. (1999), found evidence that women are less likely to take risky actions, which is the reason why the authors argue that firms with gender diversified board have lower stock volatility.

Based on these arguments, the following hypotheses are presented and tested in the thesis:

*H1: There is a positive relationship between a gender diversified board and firm performance.*

*H2: There is a lower stock volatility for firms with high gender diversified board compared to firms with a low gender diversified board.*
4 Empirical Method

In this chapter the authors present the empirical methods. The chapter includes information about the data collection, data and empirical models. The chapter ends up with motivation why secondary data is used in the thesis.

4.1 Data Collection

The data for both the regression models is collected from the database Thomson Reuters Eikon. Thomson Reuters Eikon is an extensive database that covers economic and financial data from the major financial markets. It gives access to trusted, timely and accurate content from more than 400 exchanges and is the natural environment for the investment research (Thomson Reuters, 2017). Data for number of women on board (%) is also collected manually from companies’ annual reports. The authors collect data for all the independent and dependent variables in the database, including number of women on boards. The authors export the data from Thomson Reuters Eikon to Excel, where the data for all the variables are assembled. Missing values are dealt listwise, which means that all firms that do not have available data of number of women on board are deleted. The authors use SPSS for the regression analysis. For the additional equation, the authors divide the sample into two sub-samples of equal size, using the median of the percentage of women on board. The authors make different empirical tests to be able to answer the major and minor research questions. The results are then interpreted from the empirical tests.

The previous literature and studies used in the thesis are collected from Linnaeus University’s database OneSearch. There is a wide selection of articles in this field. The authors use keywords in order to find relevant articles for the thesis. The keywords the authors use in order to limit the search in the database to find relevant articles are: gender equality, board diversity, board composition, firm performance, volatility and socially responsible investment. The advantages of the choice of searching are the accessibility of scientific articles and convenience for students at the university. OneSearch has access to multiple databases, which makes it possible for authors to investigate different objectives and views to be able to answer the research questions in particular. The disadvantages of the searching are the articles’ relevance and rating,
which differ depending on the database the articles are published in. The authors focus on articles that are published in relevant journals with high rating and connection to the research area, e.g. The *Journal of Business Ethics* and *The Journal of Finance*. The rating and relevance of the selected articles used in previous studies are highly important for the creditability of the thesis.

4.2 Data

The authors use panel data for the period 2013-2015 of listed firms in Sweden, Denmark and Finland. The sample consists of 106 listed firms, 58 firms from Sweden, 24 firms from Denmark and 24 firms from Finland.

Table 4.1 displays number of firms that is classified by the specific industry for the 106 firms used in the thesis. The firms are classified in the same industry during the three years. Industry firms have the highest proportion of the sample and are followed by Financial Firms, Customer goods firms and Health Care firms. The authors use Thomson Reuters ICB Industry classification to divided firms in specific industries. There are only real estate firms included in the Financial industry, since all the financial firms are excluded in the sample because their financial statements are not comparable with the rest of the firms (Reguera-Alvarado, Fuentes and Laffarga, 2017).

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number of firms</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic materials</td>
<td>7</td>
<td>6.6</td>
</tr>
<tr>
<td>Consumer Goods</td>
<td>15</td>
<td>14.2</td>
</tr>
<tr>
<td>Customer Services</td>
<td>10</td>
<td>9.4</td>
</tr>
<tr>
<td>Financials</td>
<td>18</td>
<td>17.0</td>
</tr>
<tr>
<td>Health Care</td>
<td>12</td>
<td>11.3</td>
</tr>
<tr>
<td>Industrials</td>
<td>30</td>
<td>28.3</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>3</td>
<td>2.8</td>
</tr>
<tr>
<td>Technology</td>
<td>6</td>
<td>5.7</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>4</td>
<td>3.8</td>
</tr>
<tr>
<td>Utilities</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>106</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.1 Number of firms by industry
To obtain the final sample, the authors follow a selection procedure consisting of the application of several filters, which are described step-by-step. First, the authors only introduce firms with available data on gender diversified board in the sample. Second, financial firms are excluded because their financial statements are not comparable with the rest of the firms (Reguera-Alvarado, Fuentes and Laffarga, 2017). Third, the authors also eliminate observations with missing values for the control variables considered in the empirical models. After this process is completed, it remains a sample of 106 firms. A sample of 106 firms over three years gives the authors 318 firm-year observations for the primary equations. The authors use quarterly data for the additional equation and it gives 1 272 firm-quarter observations. The reason why the authors only use quarterly data for the additional equation is the availability of data.

Outliers are observations that are different from the other observations. Outliers can lead to measurement errors (Hair et al., 2009, p. 86). The authors use the winsorizing process to handle the measurement errors. The winsorizing process involves transformation of extreme values to a specific value. A specified percentile of the data is used as the cut-off point. The authors winsorize all data below the 1th percentile and above the 99th percentile. The winsorizing method put more weight on the edges of the distribution. The motivation why the authors use the method is that winsorizing estimators are a robust process to handle outliers that have been used in previous studies in the same research area (Chen, 2012; Sila, Gonzalez and Hagendorff, 2015). The authors winzorize in total 49 outliers for all the variables.

4.3 Primary and Secondary Data
The credibility of empirical studies depends to a large extent on the quality of the data; therefore, the authors present which type of data that is used in the thesis and motivation for the choice. There are several reasons why the authors choose secondary analysis instead of collecting new data.

The first advantages of secondary analysis are the time and cost efficiency. Students that write a bachelor thesis on undergraduate level needs to be time efficient. The Linnaeus University offers the students access to good quality data from the University’s database. The secondary analysis allows the authors to spend more time on
the analysis and interpretation of data then on the collection of new data (Bryman 2012, p. 312).

The second advantages are the high quality of data. Thomson Reuters Eikon offers a wide range of the quantitative data with a high quality. Thomson Reuters Eikon is a powerful tool that offers professional information on the financial market and is used for financial analysis around the globe (Thomson Reuters, 2017).

The third advantages are the opportunity for longitudinal analysis. The secondary analysis offers opportunities for longitudinal research, which analyses the panel data in the thesis. It is possible to chart trends and connections over time (Bryman 2012, p. 313). This is necessary in the thesis when the authors investigate and write about the gender diversity in the boardroom.

4.4 Empirical Equations

The authors use both primary equations and an additional equation. All the equations are inspired by previous studies in the research area of gender diversified board's impact on firm performance. The primary equations are multiple regression models, which shows the gender diversified board’s impact on firm performance. Multiple regression is a useful method of analysis when the model includes a single numerical dependent variable that is described by two or more numerical independent variables (Hair et al., 2009, p. 16). The authors run the equations using ordinary least squares (OLS) estimators, which is one of the most powerful and popular methods of regression analysis (Gujarati and Porter, 2009, p. 55).

4.4.1 Primary Equations

Following the previous studies, the measurement of firm performance varies considerably. Typical variables that measure firm performance are accounting-based measures such as Return on Assets (ROA) and Return on Equity (ROE), and market-based measures such as Tobin’s q. However, previous studies have used both accounting-based measures and market-based measures. The reason why the authors use three different dependent variables that all describes firm performance is to find different relationships between gender diversified board and firm performance and to provide more complete evidence regarding those relationships. Tobin’s q, ROA and
ROE all measure firm performance, but there is minor difference among these three measurements that all measure the firm performance.


The measurement of firm performance in previous studies varies considerably. However, Tobin’s q, ROA, and ROE are the most frequently used dependent variables in previous studies. To determine the nature of the relationship between gender diversified board and firm performance, the authors use Tobin’s q, ROA and ROE. The primary equations used in the thesis are built on these variables and inspired by similar models used in previous studies (Adams and Fierra, 2009; Reguera-Alvarado, Fuentes and Laffarga, 2017).

Equation 1: \( TOBINQ_{it} = \beta_0 + \beta_1 \times WOMEN_{it} + \beta_2 \times LNASHESLT_{it} + \beta_3 \times LNSALES_{it} + \beta_4 \times TOBINQ_{t-1} + \beta_5 \times COUNTRY_{it} + \beta_6 \times INDUSTRY_{it} + \beta_7 \times YEAR_{it} + \epsilon_{it} \)

Equation 2: \( ROA_{it} = \beta_0 + \beta_1 \times WOMEN_{it} + \beta_2 \times LNASHESLT_{it} + \beta_3 \times LNSALES_{it} + \beta_4 \times ROA_{t-1} + \beta_5 \times COUNTRY_{it} + \beta_6 \times INDUSTRY_{it} + \beta_7 \times YEAR_{it} + \epsilon_{it} \)

Equation 3: \( ROE_{it} = \beta_0 + \beta_1 \times WOMEN_{it} + \beta_2 \times LNASHESLT_{it} + \beta_3 \times LNSALES_{it} + \beta_4 \times ROE_{t-1} + \beta_5 \times COUNTRY_{it} + \beta_6 \times INDUSTRY_{it} + \beta_7 \times YEAR_{it} + \epsilon_{it} \)

4.4.1.1 Dependent Variables

Tobin’s q (\( TOBINQ \)) measures the relationship between firm’s market value and the total asset value. \( TOBINQ \) is a good proxy for firm’s competitive advantage and reflects the market expectations of future earnings (Montgomery and Wernerfelt 1988). The
market-based measurement is characterized by its forward-looking aspect and reflection of the expectations of the shareholders concerning the firm’s future performance. Return on Assets (ROA) measures the relationship between firm’s net income and the total asset value. The ROA ratio indicates how profitable the firm is relation to its total assets and illustrates how well the firm is using their total assets to generate firm profit (Campbell and Minguez-Vera, 2007).

Return on Equity (ROE) measures the relationship between firm’s net income and shareholder’s equity. The ROE ratio indicates the firm’s profitability and discloser how much profit the firm have generated with the invested money from the shareholder (Bodie et al., 2014, p. 477).

4.4.1.2 Independent Variables

The independent variable WOMEN is the number of women on board is measured as the percentage of all the members on the board. The variable is used to see if there is relationship between number of women on board and firm performance. Reguera-Alvarado, Fuentes and Laffarga (2017) found a positive relationship between the variables and the authors argue that their outcome will be similar.

Three control variables are included in the primary equations. First, the authors control the firm size throughout the variable LNASSETS, which is calculated as the natural logarithm of the firm’s total assets. The control variable is used in order to better ascertain gender diversified board’s impact on firm performance. The authors argue that LNASSETS affects firm performance positively, which also has been the outcome in previous studies (Carter, Simkins and Simpson, 2003).

Second, the authors control the firm’s growth throughout the variable LNSALES, which is calculated as the natural logarithm of firm’s total sales. The natural logarithm is used for both the first and the second control variables. The reason why the authors use the natural logarithm is to avoid size impacts. The authors argue that LNSALES affects firm performance positively. Adams and Ferreira (2009) found a positive relationship between LNSALES and ROA. The authors of the thesis argue that their outcome will be similar.
Third, the authors control the lagged of the dependent variables throughout the variables $TOBINQ_{t-1}$, $ROA_{t-1}$ and $ROE_{t-1}$, as are considered by Adams and Ferreira (2009) and Reguera-Alvarado, Fuentes and Laffarga (2017). The authors argue that last year’s firm performance may affect this year’s firm performance positively, which is controlled using lagged dependent variables. Adams and Ferreira (2009) and Reguera-Alvarado, Fuentes and Laffarga (2017) found a positive relationship and the authors of the thesis argue that the outcome will be similar.

Three dummy variables are included in the primary equations. First, the dummy variable $COUNTRY$ is used for each country considered in the thesis. The dummy variable is used in order to control and better understand the possible differences among the three countries. Second, the dummy variable $INDUSTRY$ is used for each industry considered in the thesis. The authors divide the sample into ten different industries using the firms’ ICB industry names. Financial firms are one of the industries, but the firms under this group are only real estate firms. Otherwise, financial firms are excluded in the sample. The dummy variable is used in order to control and better understand the possible differences among the different industries. Third, the dummy variable $YEAR$ is used for each year considered in the thesis. The dummy variable is used in order to control and better understand possible differences between the years.
The additional equation is called Single Index Model and is used to be able to answer the minor research question. The additional equation is based on the Capital Asset Pricing Model (CAPM), which is a centrepiece of modern financial economics. The model shows the relationship between the risk of a stock and the expected return (Bodie et al., 2014, p. 290). The differences between the models are that the intercept, the risk-free rate, of CAPM is moved to the dependent variable and an intercept is estimated instead. That is why the Single Index Model includes an alpha, which measures the abnormal return of a stock. The authors divide the sample into firms with high gender diversified board and firms with low gender diversified board using the median of number of women on board (%) as the cut-off point. The groups are then tested separately. The variables for the additional equation are explained in Table 4.2.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOBINQ</td>
<td>Tobin’s q</td>
<td>Market Market/Total Assets</td>
</tr>
<tr>
<td>ROA</td>
<td>Return on Assets</td>
<td>Net income/Total Assets</td>
</tr>
<tr>
<td>ROE</td>
<td>Return on Equity</td>
<td>Net income/Shareholder’s equity</td>
</tr>
<tr>
<td>WOMEN</td>
<td>Board composition</td>
<td>Number of women on board (%)</td>
</tr>
<tr>
<td>LNASSETS</td>
<td>Firm size</td>
<td>Lagged logarithm of total assets</td>
</tr>
<tr>
<td>LNSALES</td>
<td>Firm growth</td>
<td>Logarithm of total sales</td>
</tr>
<tr>
<td>TOBINQt-1</td>
<td>Last year’s Tobin’s q</td>
<td>Lagged Tobin’s q</td>
</tr>
<tr>
<td>ROAt-1</td>
<td>Last year’s Return on Assets</td>
<td>Lagged Return on Assets</td>
</tr>
<tr>
<td>ROEt-1</td>
<td>Last year’s Return on Equity</td>
<td>Lagged Return on Equity</td>
</tr>
<tr>
<td>COUNTRY</td>
<td>Countries of activity</td>
<td>Dummy variable for each country considered</td>
</tr>
<tr>
<td>INDUSTRY</td>
<td>Industries of activity</td>
<td>Dummy variable for each industry considered</td>
</tr>
<tr>
<td>YEAR</td>
<td>Years of activity</td>
<td>Dummy variable for each year considered</td>
</tr>
</tbody>
</table>

Table 4.2 Variables of the Primary Equations

4.4.2 Additional Equation
The additional equation is called Single Index Model and is used to be able to answer the minor research question. The additional equation is based on the Capital Asset Pricing Model (CAPM), which is a centrepiece of modern financial economics. The model shows the relationship between the risk of a stock and the expected return (Bodie et al., 2014, p. 290). The differences between the models are that the intercept, the risk-free rate, of CAPM is moved to the dependent variable and an intercept is estimated instead. That is why the Single Index Model includes an alpha, which measures the abnormal return of a stock. The authors divide the sample into firms with high gender diversified board and firms with low gender diversified board using the median of number of women on board (%) as the cut-off point. The groups are then tested separately. The variables for the additional equation are explained in Table 4.2.
Equation 4: \( E(r_i) - rf = \alpha_i + \beta_1 (E(r_m) - rf) + \epsilon_{it} \)

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Independent variables and coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>( E(r_i) - rf ) = Expected return on the stock minus the risk-free rate (Excess return on the stock)</td>
<td>( \alpha_i ) = Abnormal return</td>
</tr>
<tr>
<td>( \beta_1 ) = Beta of the stock (Volatility)</td>
<td></td>
</tr>
<tr>
<td>( E(r_m) - rf ) = Expected market rate of return minus risk-free rate (Market premium)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3 Variables of the Additional Equation

4.4.2.1 Dependent Variable
The dependent variable of the additional equation is the excess return on the stock, \( E(r_i) - rf \). The expected return is calculated as the percentage change over time in stock price, \( E(r_i) = (\text{Stock Price}_t - \text{Stock Price}_{t-1}) / \text{Stock Price}_{t-1} \). Since the sample consists of firms from three different countries, the authors include a risk-free rate that can be tested for the overall sample. There is no rate that only covers the three countries, so the authors include the 6-month Euro Market Rate (Sveriges Riksbank, 2011).

4.4.2.2 Independent Variables
The independent variable of the additional model is the market premium. The market premium is calculated as the expected rate of return on the market minus the risk free rate. The coefficient of the market premium is the authors’ measurement for stock volatility. The authors argue that the coefficient of the market premium is lower for firms with a gender diversified board, which means that the firms have lower volatility. This has also been the outcome in previous studies (Parker et al., 2016). The expected rate of return on the market is calculated as the percentage change over time in market price, \( E(r_m) = (\text{Market Price}_t - \text{Market Price}_{t-1}) / \text{Market Price}_{t-1} \). The authors use the market index OMX Nordic 40, which includes the largest and most actively traded firms from the Swedish, Danish and Finnish stock market (Nasdaq, 2017). The same risk-free rate that is used for the dependent variable, 6-month Euro Market Rate, is also used for the independent variable.
5 Empirical Results

In this chapter the authors present the empirical results from both the primary equations and additional equation. The authors present the descriptive statistics, Pearson correlation and the coefficients for both the models.

5.1 Gender diversified board’s impact on firm performance

5.1.1 Descriptive Statistics and Pearson Correlation

Table 5.1 shows the descriptive statistics of 58 Swedish firms, 24 Danish firms and 24 Finnish firms for the variables used in the primary equations. The table includes mean, median, standard deviation, skewness and kurtosis. The mean of the dependent variables are 1.189 (TOBINQ), 6.591% (ROA) and 12.714% (ROE). TOBINQ is the dependent variable that has the lowest standard deviation and ROE is the dependent variable with highest standard deviation. The lagged dependent variables have similar means and standard deviations. The mean of WOMEN is 28.869% with a standard deviation of 12.124%. TOBINQ has a skewness of 3.058, ROA has a skewness of 0.528 and ROE has a skewness of -1.560. TOBINQ has a kurtosis of 13.538, ROA has a kurtosis of 4.899 and ROE has a kurtosis of 7.338.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOBINQ</td>
<td>318</td>
<td>1.189</td>
<td>0.788</td>
<td>1.366</td>
<td>3.435</td>
<td>13.538</td>
</tr>
<tr>
<td>ROA</td>
<td>318</td>
<td>6.591</td>
<td>5.935</td>
<td>8.056</td>
<td>0.528</td>
<td>4.899</td>
</tr>
<tr>
<td>ROE</td>
<td>318</td>
<td>12.714</td>
<td>13.110</td>
<td>18.282</td>
<td>-1.560</td>
<td>7.338</td>
</tr>
<tr>
<td>WOMEN</td>
<td>318</td>
<td>28.869</td>
<td>27.270</td>
<td>12.124</td>
<td>0.368</td>
<td>-0.132</td>
</tr>
<tr>
<td>LNASSETS</td>
<td>318</td>
<td>21.715</td>
<td>21.861</td>
<td>1.417</td>
<td>-0.516</td>
<td>0.359</td>
</tr>
<tr>
<td>LNSALES</td>
<td>318</td>
<td>14.421</td>
<td>14.582</td>
<td>1.497</td>
<td>-0.435</td>
<td>-0.388</td>
</tr>
<tr>
<td>TOBINQ_{t-1}</td>
<td>318</td>
<td>0.967</td>
<td>0.648</td>
<td>1.118</td>
<td>3.058</td>
<td>11.307</td>
</tr>
<tr>
<td>ROA_{t-1}</td>
<td>318</td>
<td>6.568</td>
<td>5.860</td>
<td>7.870</td>
<td>0.540</td>
<td>4.311</td>
</tr>
<tr>
<td>ROE_{t-1}</td>
<td>318</td>
<td>12.532</td>
<td>12.925</td>
<td>17.895</td>
<td>-1.540</td>
<td>7.456</td>
</tr>
</tbody>
</table>

Table 5.1 Descriptive Statistics of the Primary Equations
Furthermore, the authors found it of great importance to control the collinearity between the variables. Table 5.2 shows the Pearson correlation between the variables in the equations, excluding affects from other variables. There are high correlations between the lagged dependent variables and the dependent variables, which also can be seen in the results. *LNASSETS* has a positive relationship with *ROA* and *ROE*. *LNASSETS* and *LNSALES* are highly correlated at a one percent significance level. *LNSALES* has a positive relationship with *ROE*. The coefficient *WOMEN* is negatively correlated to *TOBINQ* by 0.104.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>TOBINQ</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>ROA</td>
<td>0.623***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>ROE</td>
<td>0.452***</td>
<td>0.894***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>WOMEN</td>
<td>-0.104*</td>
<td>0.049</td>
<td>0.085</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>LNASSETS</td>
<td>-0.083</td>
<td>0.093*</td>
<td>0.109*</td>
<td>0.103</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>LNSALES</td>
<td>0.041</td>
<td>0.071</td>
<td>0.117**</td>
<td>0.036</td>
<td>0.747***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>TOBINQ_{t-1}</td>
<td>0.914***</td>
<td>0.566***</td>
<td>0.410***</td>
<td>-0.094*</td>
<td>-0.104*</td>
<td>0.025</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>ROA_{t-1}</td>
<td>0.587***</td>
<td>0.658***</td>
<td>0.506***</td>
<td>0.064</td>
<td>0.106*</td>
<td>0.069</td>
<td>0.587***</td>
<td>1</td>
</tr>
<tr>
<td>9.</td>
<td>ROE_{t-1}</td>
<td>0.404***</td>
<td>0.511***</td>
<td>0.478***</td>
<td>0.110**</td>
<td>0.127**</td>
<td>0.136**</td>
<td>0.439***</td>
<td>0.892***</td>
</tr>
</tbody>
</table>

Table 5.2 Pearson Correlation Coefficients

P-value of the coefficients are presented in parentheses (two-tailed). ***, ** and * indicate a significant of less than 1 %, less than 5% and less than 10 %, respectively.
5.1.2 Regression Results

The primary equations have been tested for the overall sample that includes data from Swedish, Danish and Finnish firms. The authors have three equations, Equation 1 have \( TOBINQ \) as the dependent variable, Equation 2 have \( ROA \) as the dependent variable and Equation 3 have \( ROE \) as the dependent variable. The results of gender diversified board’s impact on firm performance are presented in Tables 5.3 and 5.4.

As shown in Table 5.3, all three primary equations are significant at a one percent level, which means that the equations are composed with high credibility. Equation 1, which has \( TOBINQ \) as the dependent variable, has the greatest adjusted R\(^2\). The adjusted R\(^2\) of the Equation 1 is 0.836, which means that the independent variables describe the dependent variable by 83.6%. This can be compared to the Equation 2, which has \( ROA \) as dependent variable with adjusted R\(^2\) of 0.428 and Equation 3, with \( ROE \) as dependent variable with adjusted R\(^2\) of 0.183.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Dependent variable</th>
<th>Adjusted R(^2)</th>
<th>F-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>( TOBINQ )</td>
<td>0.853</td>
<td>109.124</td>
<td>0.000</td>
</tr>
<tr>
<td>2</td>
<td>( ROA )</td>
<td>0.420</td>
<td>14.483</td>
<td>0.000</td>
</tr>
<tr>
<td>3</td>
<td>( ROE )</td>
<td>0.223</td>
<td>6.346</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 5.3 Model Summary of the Primary Equations

The results from the primary equations are displayed in Table 5.4. The relationship between WOMEN and ROA and ROE is positive. However, these are statistically insignificant at any conventional levels. The coefficient WOMEN results from all three equations show that there is no significant relationship between number of women on board and firm performance for the overall sample. Neither the control variables LNASSETS and LNSALES are statistically significant. However, the lagged dependent variables are statistically significant at a one percent level for all three equations.
Since the relationships between number of women on board and firm performance for the overall sample are statistically insignificant at any conventional levels, the authors tested for differences among the countries. The authors rerun primary equations using data from each individual country. Based on this individual analysis, the authors find a statistically significant relationship between WOMEN and TOBINQ for Swedish firms, but statistically insignificant relationship for Danish and Finnish firms.

Table 5.5 shows the result for Equation 1 for Swedish firms. For Swedish firms, there is a positive and significant relationship between number of women on board and firm performance is measured by TOBINQ. This is statistical significant at a one percent level. The control variable TOBINQ_{t-1} is positive and statistically significant at a one percent level. LNSALES is positive and significant at a five percent level.

<table>
<thead>
<tr>
<th>Equation 1 (TOBINQ)</th>
<th>Equation 2 (ROA)</th>
<th>Equation 3 (ROE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOMEN</td>
<td>-0.001 (0.854)</td>
<td>0.014 (0.665)</td>
</tr>
<tr>
<td>LNASSETS</td>
<td>0.009 (0.815)</td>
<td>-0.140 (0.755)</td>
</tr>
<tr>
<td>LNSALES</td>
<td>0.019 (0.630)</td>
<td>0.380 (0.405)</td>
</tr>
<tr>
<td>Lagged Dependent Variable</td>
<td>1.112 (0.000)***</td>
<td>0.634 (0.000)***</td>
</tr>
</tbody>
</table>

Table 5.5 Coefficients of the Primary Equations
P-value of the coefficients are presented in parentheses (two-tailed). ***, ** and * indicate a significant of less than 1 %, less than 5% and less than 10 %, respectively.

Since the relationships between number of women on board and firm performance for the overall sample are statistically insignificant at any conventional levels, the authors tested for differences among the countries. The authors rerun primary equations using data from each individual country. Based on this individual analysis, the authors find a statistically significant relationship between WOMEN and TOBINQ for Swedish firms, but statistically insignificant relationship for Danish and Finnish firms.

Table 5.5 shows the result for Equation 1 for Swedish firms. For Swedish firms, there is a positive and significant relationship between number of women on board and firm performance is measured by TOBINQ. This is statistical significant at a one percent level. The control variable TOBINQ_{t-1} is positive and statistically significant at a one percent level. LNSALES is positive and significant at a five percent level.

<table>
<thead>
<tr>
<th>Equation 1 (TOBINQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOMEN</td>
</tr>
<tr>
<td>LNASSETS</td>
</tr>
<tr>
<td>LNSALES</td>
</tr>
<tr>
<td>TOBINQ_{t-1}</td>
</tr>
<tr>
<td>Country Included</td>
</tr>
<tr>
<td>Industry Included</td>
</tr>
<tr>
<td>Year Included</td>
</tr>
</tbody>
</table>

Table 5.5 Coefficients of Equation 1 for Swedish firms
P-value of the coefficients are presented in parentheses (two-tailed). ***, ** and * indicate a significant of less than 1 %, less than 5% and less than 10 %, respectively.
5.2 Gender diversified board’s impact on stock volatility

5.2.1 Descriptive Statistics

Table 5.6 shows that the dependent variable has a mean of 4.4% and a standard deviation of 14.3%. The market premium has a mean of 3.8% and a standard deviation of 4.9%. The skewness is low for both the variables. The excess return on the stock has a value of kurtosis of 7.11 and the market premium has a value of kurtosis of 0.613. Since Equation 4 only include one independent variable, a correlation analysis is excluded.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>$E(r_i) - rf$</td>
<td>1272</td>
<td>0.044</td>
<td>0.0304</td>
<td>0.143</td>
<td>0.935</td>
<td>7.11</td>
</tr>
<tr>
<td>$E(r_m) - rf$</td>
<td>1272</td>
<td>0.038</td>
<td>0.0289</td>
<td>0.049</td>
<td>1.304</td>
<td>0.613</td>
</tr>
</tbody>
</table>

Table 5.6 Descriptive Statistics of the Additional Equation

5.2.2 Regression Results

The authors sort the sample based on the number of women on boards into two groups, firms with high gender diversified board and firms with low gender diversified board. The additional equation is then tested for both the groups separately. The authors use the median of the overall sample as the cut-off point.

Table 5.7 shows that the additional equation is statistically significant for both the groups at a one percent level. The adjusted $R^2$ shows that the independent variable can describe the dependent variable by 13.4% for firms with low gender diversified board and 15.8% for firms with high gender diversified board.

<table>
<thead>
<tr>
<th></th>
<th>Adjusted $R^2$</th>
<th>F-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>High gender diversified board</td>
<td>0.134</td>
<td>99.081</td>
<td>0.000</td>
</tr>
<tr>
<td>Low gender diversified board</td>
<td>0.158</td>
<td>119.861</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 5.7 Model Summary of the Additional Equation
Table 5.8 shows that the intercepts are insignificant for both the groups. Firms with a high gender diversified board have a coefficient of the market premium (Beta) of 1.083. This can be compared to 1.273 for firms with a low gender diversified board. It is statistically significant at a one percent level.

<table>
<thead>
<tr>
<th></th>
<th>High gender diversified board</th>
<th>Low gender diversified board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.002</td>
<td>0.001</td>
</tr>
<tr>
<td>$E(r_m) - rf$</td>
<td>1.083***</td>
<td>1.273***</td>
</tr>
</tbody>
</table>

Table 5.8 Coefficients of the Additional Equation
6 Analysis

In this chapter the empirical results of both the primary equations and additional equation will be analysed and interpreted. The authors link together the previous chapters and answer both the major and minor research question. The analysis of the several results will be clearly described and serves as the base for the conclusion.

6.1 Gender diversified board’s impact on firm performance

Table 5.1 provides the descriptive statistics for the overall sample. The mean of the number of women on board are in line with the general representation in the boardroom in Sweden, Denmark and Finland that is described in Table 3.2, which indicates that the sample is representative. The mean value of 28.9% can be compared to 24.4% that is the average representation of women in the boardroom among EU-Member States in 2015. This indicates that the Sweden, Denmark and Finland is actively working to increase women representation in the boardroom (Dawson, Kersley and Natella, 2016).

The mean value of TOBINQ, is 1.189, which is in line with the mean value of 1.353 in the study by Rose (2007). The mean value of ROA, is 6.591 %, which can be compared with the mean values of 3.190% in Adams and Fierra (2009) and 3.200% in Liu, Wei and Xie, (2014). This indicates that the mean value of ROA in this thesis is higher than studies conducted with US and Chinese firms. The reason why the mean value of ROE is higher than ROA is that the denominator total assets is higher than shareholder’s equity.

The mean value of the control variable LNSALES is 14.421, which is in line with the mean value of 13.217 in the study by Reguera-Alvarado, Fuentes and Laffarga (2017). The mean value LNASSETS is 21.715. Previous studies use other control variables to control firm size and therefore this value cannot be compared to mean values in previous studies.

TOBINQ and ROA have a positive skewness. TOBINQ has a higher skewness, which means that it is more positively skewed compared to ROA. On the contrary, ROE is negatively skewed. All three dependent variables have positive values of kurtosis.
which indicate that the distribution has heavier tails and sharper peak than the normal distribution. Since the sample consists of 318 observations, the authors can be less concerned about nonnormal values (Hair et al., 2009, p. 70).

In Table 5.2, it is clearly shown that all lagged dependent variables are highly correlated at a one percent significance level. The result indicates that last year’s firm performance affects this year’s firm performance. The lagged variables are correlated to each other. $LN_{ASSETS}$ and $LN_{SALES}$ are highly correlated at a one percent significance level. The collinearity between $LN_{ASSETS}$ and $LN_{SALES}$ can explain why the variables are statistically insignificant. $LN_{ASSETS}$ measures a firm’s size and $LN_{SALES}$ measures a firm’s growth. The result indicates that it is a natural correlation since if the firm grows, the size affects positively and that is in line with Reguera-Alvarado, Fuentes and Laffarga (2017). Otherwise, there are no strong correlations among the variables.

As shown in Table 5.3, all the three primary equations are statistical significant at one percent level, which indicates that the models are well composed and have high level of credibility. The adjusted $R^2$ in Equation 1 and Equation 2 are high compared to the studies by Reguera-Alvarado, Fuentes and Laffarga (2017) and Adams and Fierra (2009) that use a similar regression models. The reason for the high adjusted $R^2$ in these equations can be explained by the strong relationship between the lagged dependent variables and the dependent variables.

The results from the primary equations are displayed in Table 5.4. The coefficients of the $WOMEN$ variable in the three equations are insignificant for the overall sample at any conventional level and do not support H1. This means that under all three primary equations, high gender diversified board did not result in any significant higher firm performance. The insignificant results for the overall sample are in line with Rose (2007).

Since the results show no significant relationship between number of women on board and firm performance for the overall sample, the authors investigate in the difference in the specific countries. The authors find a statistically significant and positive
relationship between number of women on board and TOBINQ for Swedish firms at a one percent significance level. The authors do not find any significant relationship between number of women on board and firm performance measured by ROA and ROE. The results show no statistically significant relationships between number of women on board and firm performance for Danish and Finnish firms at any conventional level. The evidence from the Swedish firms is in line with Reguera-Alvarado, Fuentes and Laffarga (2017) and Carter, Simkins and Simpson (2003) and the evidence from Danish and Finnish firms is in line with Rose (2007).

There are several possible explanations for the results. First, there is most available data on the number of women on board for Swedish firms and therefore the Swedish firms make up most of the overall sample, which can affect the outcome. Second, Sweden is ranked as one of the best countries to live in and the country has good gender equality (Gray, 2017). The authors argue that the result can be based on the strong gender equality that exists in the Swedish society and business environment. Swedish firms have higher equal gender representation in the boardroom compared to Danish and Finnish firms, which can be seen in Table 3.2. The firms and investors interest in the firm’s market values can explain the existing relationship between number of women on board and Tobin’s q. The authors argue that investors’ interest in SRI can explain why firms with high gender diversified board has a positive and statistically significant relationship with Tobin’s q, that is a market-based measurement of firm performance.

6.2 Gender diversified board’s impact on stock volatility

Table 5.6 shows that, the excess return on the stocks has a higher mean than the market premium. The return on the stocks has been higher than for the market. The standard deviation is higher for the excess return on the stocks, compared to the market premium. It is risker to invest in stocks than in the overall market since their standard deviation is higher. The higher risk could be the reason why the return has been higher. The excess return on the stocks has a great value of kurtosis, which means that it has a peaked distribution. The distribution of the market premium is flat, since the low value of kurtosis. Since the sample consists of 1 272 observations, the authors can be less concerned about nonnormal values (Hair et al., 2009, p. 70).
Table 5.7 shows that the additional equation is statistically significant even if the adjusted $R^2$ is low for both the groups (Hair et al., 2009, p. 160). The reason for the low adjusted $R^2$ is that the equation only includes one independent variable, which is the market premium. There are many other factors that affect the return of a stock more than the market return, for instance firm performance, dividends and expectations from analysts.

The result from the additional equation is displayed in Table 5.8. The intercepts are statistically insignificant at any conventional level for both groups. This means that there are no abnormal returns for none of the groups, which means that if the return on the market is zero the return on the stocks will also be zero (Bodie et al., 2014, p. 290). Firms with a high gender diversified board have a lower coefficient of the market premium (Beta) compared to firms with a low gender diversified board. The coefficients are statistically significant at a one percent level and the results support H2. The result is in line with Parker et al. (2016). Both the coefficients of the market premium (Beta) are close to one, which means that they are affected of return on the overall market. It is valuable for investors using SRI strategies to know that firms with high gender diversified board have lower stock volatility. The reason why firms with high gender diversified board have lower stock volatility can be explained by the findings that a gender diversified board is less likely to take risky decisions and be involved in unethical and unhealthy decisions, which is in line with Arfken, Bellar and Helms (2004) and Schubert et al. (1999).
7 Conclusion

In this chapter the authors’ conclusions based on previous chapters are presented. Furthermore, the contributions of the thesis are presented and the chapter also includes limitations for the thesis and suggestions for future research.

The authors examine gender diversified board’s impact on firm performance for Swedish, Danish and Finish firms. The thesis is motivated by the fact board gender diversity is the latest in emerging body of academic and quantitative research (Morgan Stanley, 2016) and the ongoing intense debate in Sweden, Denmark and Finland concerning a more equal gender representation in the boardroom. The authors argue that there is a positive relationship between a gender diversified board and firm performance based on the argument that a high gender diversified board contributes to a better firm performance because decisions are based on evaluation on more alternatives compared to a homogeneous board (Hunt, Layton, and Prince, 2015). The thesis empirical findings from the test with the overall sample are statistically insignificant at any conventional level. This means that under all three primary equations, high gender diversified board did not result in any higher firm performance. The result is in line with a previous study by Rose (2011) that did not found any significant relationship between number of women on board and firm performance. However, when the authors examine just Swedish firms, the empirical findings differ and the authors find a statistically significant and positive relationship between number of women on board and Tobin’s q. The results support the first hypothesis and are in line with the findings from Carter, Simkins and Simpson (2003) and Reguera-Alvarado, Fuentes and Laffarga (2017). The positive and statistically significant relationship is valuable for Swedish firms since the result shows that firms with higher gender diversified board generates higher firm performance than firm with low gender diversified board.

The authors extend previous studies on the relationship between gender diversified board and firm performance by introducing the gender diversified board’s impact on stock volatility for Swedish, Danish and Finnish firms. The extension of the thesis is motivated by the growing trend that investors and asset managers investing according SRI strategies. The gender composition of the board has become a key factor for their
decision-making (Barclays, 2014). The authors argue that firms with high gender diversified board have lower stock volatility than firms with low gender diversified board based on the argument that women are less risk averse and a gender diversified board can avoid unethical and unhealthy decisions for the firm (Arfken, Bellar and Helms, 2004). The thesis empirical findings from the additional equation support the second hypothesis and confirm that stock volatility is lower for firms with high gender diversified board for Swedish, Danish and Finish firms. The authors measure the stock volatility with the coefficient of the market premium (Beta) from the well-known single index model that is based on CAPM that is a centrepiece of modern financial economics. The empirical results indicate that the gender composition of the board has an impact on the stock volatility and it is relevant for investors to take into account the gender composition of the board into their decision-making concerning the willingness of risk taking. The authors ensure the validity and reliability in the thesis by observed variables that are as accurate as possible and free from measurement errors using the winsorizing process.

Gender equality in the senior exclusive positions and corporate boardroom has gained social attention around the world for several years. The existing glass ceiling phenomena has prevented women to advance to the boardroom and top senior exclusive positions. The implications of the results are valuable for the society and for future research in this area. The result for Swedish firms shows that gender equality in the boardroom is associated with improved quality of decisions and by that means higher financial performance for the firms. The implication of the result is valuable for the firms to gain higher financial performance and for females who want to advance to the boardroom. The authors believe that the indication of the results could increase the status of women in the boardroom and in the society when it comes to clear women’s underrepresentation in the boardroom. The implication of the inconclusive results for Swedish, Danish and Finnish firms can be further investigated by researchers in the future.

Several potential limitations of the thesis provide opportunities for future research. First, the thesis only includes a limited sample from Sweden, Denmark and Finland from the time period 2013-2015 due to limited available data and limited time frame.
Second, there was no available data on the board structure for the firms. The authors control the board structure with a country dummy and suggest future researchers to use alternative methods to control the different board structure when examining multiple countries with different board structures. Future research may use a dummy variable for better control the one-tier and two-tier board structures. Third, the authors choose variables based on the way they have been interpreted in previous studies. Finally, future research may also take into account the gender representation in the top management that also have a significant impact on the firm performance.
List of References


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