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WOMEN IN THE BOARDROOM AND FIRM FINANCIAL PERFORMANCE: EVIDENCE FROM THE NASDAQ OMX HELSINKI FIRMS

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ABSTRACT

This study investigates the relationship between female board members in publicly listed companies and firm financial performance. The cross-sectional data set involves 82 publicly listed companies from Nasdaq OMX Helsinki stock exchange in year 2016. The study is conducted as an OLS regression analysis with board diversity as an explanatory variable and firm size, board size, industrial sector and performance measure at different time point as control variables. The empirical analysis investigates the relationship between Return on Asset, Return on Equity and gender diversity within the board of directors.

This study contributes to previous literature by conducting the research on latest data from Finnish companies. As far as one is concerned, there are no published literature that would investigate the relationship between female board members and financial performance of the Nasdaq OMX Helsinki firms.

Empirical findings of this study suggest a positive and statistically significant relationship between firm financial performance and board diversity. Moreover, empirical evidence suggests that financial performance measures of the sample firms are positively correlated.

KEYWORDS Corporate governance, firm performance, board of directors, gender diversity, return on asset, return on equity

1. INTRODUCTION

The fundamental function of modern-day corporations is to create value for their stakeholders. This function is merely in the hands of corporate boards, who's duty is to hire and fire company CEO and monitor, as well as advice, the management. One of the most noteworthy corporate governance issues that modern-day companies face is to compose an effective board of directors. Previously, policy-makers and academics thought that the solution to this corporate governance issue was to manage the independency or the objectivity of the board of directors. The general belief was that, directors who are independent of any conflicts of interest with the stakeholders of the company, are able to effectively supervise the company. However, it is not a simple task to measure director independence, i.e. the level of "collective independence of thought" and compose independent boards (Adams, 2016). Moreover, hardly any evidence supported the assumption that independent boards are also effective. Later findings suggested that, if board members are recruited based on the so-called "Old-Boys-Club" meaning that very little, if any, female board members are given board seats, the board is less likely to perform well (See e.g. Adams 2016; Adams, Hermalin & Weisbach 2010).

Ever since the theory of independent boards was partially disputed by many researchers, academics have suggested another solution to the issue of composing effective boards; recruit members, who share different cultural, educational or religious views and increase gender diversity in the boardroom (See e.g. Carter, Simkins & Simpson 2003; Brancato 1999). Moreover, as the workforce of western economy is becoming more diverse, companies meet potential candidates for managerial positions and board of directors from diverse backgrounds. The interest of hiring managers and directors from wider talent pool as well as public pressure regarding social equality have driven companies to reshape their managerial groups and corporate boards. Companies are suggested to diverse their management and compose gender-neutral board of directors. The topic of diversity in corporate boards has gained public attention after the reformation of national and international corporate governance recommendations and increased discussion on gender equality.

Recently, there has been a substantial amount of discussion in public newspapers and publications of national institutions regarding the composition of the board of directors in publicly listed companies. For example, the newspaper Helsingin Sanomat (25.7.2016) told about women in the boardroom of Finnish publicly listed companies in an article *"Joka kymmenes pörssiyhtiö yhä vailla naista"*. According to the report, the number of women in the board of directors has increased a staggering 50 per cent since 2010. Such a notable increase is a milestone for women in the breaking of the so-called *"glass-ceiling"* which means that there is an invisible barrier that keeps women and minorities away from top managerial positions.

During the period of this study around 10 per cent of the Nasdaq OMX Helsinki companies lack female representation in their board of directors. Some sources of public media criticize these companies of favoring men in the nomination of CEOs and other executive managers. An article *"Vain viisi naista on pörssiyhtiön johtajana Suomessa: "Kehitys on ollut hidasta"* by the newspaper Aamulehti (16.11.2016), reminds that Finnish companies still prefer men in top management for as much as in only five of the publicly listed companies, woman served as the CEO of the company. Moreover, the executive committees of the companies are still predominantly male. There has even been a slight decrease in the number of women in top management groups from 21,5 per cent in 2015 to 20 per cent in 2016 (Chamber of Commerce 16.11.2016).

But why does this topic earn so much coverage in national news and corporate governance research? As stated by Adams (2016), diversity is often seen as a resource for companies and diverse corporate boards regarded more effective than those consisting of a homogenous group of board members. Moreover, diversity within the board of directors may benefit the company in several ways. Increased diversity within the board of directors may be a positive signal for job applicators, attracting qualified persons outside the homogenous pool of job applicants. Furthermore, stakeholders often see diversity as an optimistic firm characteristic that could improve company's reputation. Additionally, diversity within the boardroom may improve decision-making as the board of directors consists of a more heterogeneous group of people. (See e.g. Rose 2007; Carter et al. 2003). Shrader, Blackburn & Iles (1997), for example, made a statement that gender

diversity in top management and firm performance are positively associated with each other. They proposed that the positive impact of women managers on financial performance is a result of recruiting from a more diverse talent pool.

Diversity is frequently associated with creativity and innovation. Siciliano (1996), for example, suggested that diverse boards are associated with higher levels of social performance whereas Bantel (1993) stated that functional diversity in top management groups has a positive effect on decision-making. All in all, plenty of studies on diversity issues agree with the general belief that increased diversity in the boardroom is associated with improved performance. This paper examines further the assumption that gender diversity within the board of directors is related to improved financial performance.

1.1. The purpose of the study

The purpose of this study is to investigate whether female directors are associated with better financial performance involving evidence from the Finnish publicly listed companies. The study is motivated by recent discussion regarding gender diversity in the boardrooms and reports on tightened national recommendations with regards to gender equality. Additionally, motivation to this paper come from previous studies on board diversity and firm performance. For instance, Erhardt, Werbel & Shrader (2003) and Carter et al. (2003) reported that board diversity has a positive impact on firm performance within US firms. Furthermore, Brancato (1999) reports that diversified boards are associated with better corporate governance practiced by the board of directors. Miller & Triana (2009) find out that board diversity is positively related to innovation and racial diversity within the board of directors is positively associated with firm reputation. Both, firm reputation and innovation can be regarded as financially beneficial factors for companies.

All in all, previous findings support the assumption that companies benefit from diverse boards in many ways, eventually leading to better organisational performance. Hence, it is worth studying if similar results betwen board diversity and financial performance can

be found from the Finnish markets. The ongoing discussion on gender equality in European countries often suggests that, by increasing diversity in top management and in boardrooms, leads to better financial peformance. This study provides useful information on, whether or not it is reasonable, in terms of profitability, for companies to improve gender equality in corporate boards. Moreover, the results of this paper can be used as a guideline for improving national recommendations and corporate governance of public and private institutions.

Gender diversity was first acknowlished in Finnish national recommendations of corporate governance in 2003 after the discussion regarding effective boardrooms stepped up. One of the reasons for the increasing discussion was past failure of composing independent and effective corporate boards with the ability to supervise companies's managements succesfully. Board independence and effective decision-making can be obtained by increasing board diversity. Carter et al. (2003), for example argued that diverse boards would be able to better supervise companiess. Board independence and effective decision-making can be obtained by increasing board diversity. Carter et al. (2003), for example argued that diverse boards would be able to better supervise companies. International and national corporate governance codes and standards have changed drastically during the past two decades and many countries have already included a gender quota in national corporate governance regulations. In Finland, a recommendation on representation of women in corporate boards was first introduced in the corporate governance code of 2003 and has since been included in it.

The study examines the relationship between return on asset (ROA), return on equity (ROE) and board diversity of 82 publicly listed companies from the Nasdaq OMX Helsinki stock exchange. The two financial performance measure, ROA and ROE, are described more precisely in chapter 5.1.1. Variables from the cross-sectional data set are applied in an OLS regression model in order to investigate the relationship between explanatory variable, board diversity and explained variable, ROA and ROE together with several control variables. As a contribution to previous literature, this study investigates the relationship between firm performance and women in the boardroom using data from Finnish publicly listed companies. As far as one is concerned, to date,

there are no existing literature on gender diversity and firm performance involving Finnish, publicly listed companies.

Previous studies on gender diversity have involved a wide range of different financial ratios in order to measure and compare firm performance. The most common performance measure in diversity studies is perhaps Tobins' Q, used by, for instance, Carter et al. (2003), Adams & Ferreira (2009), Rose (2007) and Campbell & Minguez-Vera (2008). However, this paper use ROA and ROE as the two financial performance ratios. These two profitability measures are previously used by Shrader et al. (1997) in a study on gender diversity in firm management and boardroom and link between firm performance. Shrader et al. (1997) argue, that ROA and ROE give a relatively good basic information on firm profitability. Moreover, these two performance measures are relatively easy to calculate and they combine financial information from firm's income statement and balance sheet. As a comparison, Tobin's Q is based on information taken merely from firm's balance sheet. Erhardt et al. (2003) used firm ROA and ROI as profitability measures for sample firms. From shareholders point of view, it is more valuable to measure performance as the return on equity as it captures the ratio of company's earnings on shareholder's equity.

1.2. Research hypothesis

Empirical analysis of this study investigates the relationship between number of women in the boardroom and firm financial performance. More precisely, this paper examines, if gender diversity in the boardroom has a positive impact on two financial ratios, ROA and ROE. For example, Erhardt et al. (2003), Carter et al. (2003), as well as Isidro & Sobral (2014) with few limitations, all reported positive relationship between the number of women in the board of directors and firm financial performance. Moreover, as women and men often present different personal characteristics across nations, educational levels and ages (Feingold 1994), it is plausible that they also have differing opinions on corporate issues. The variety of opinions relative to personal characteristics could initially improve decision-making within the board of directors and further lead to improved

financial success. Hence, the general expectation is that higher levels of board diversity lead to better financial performance. Based on this assumption, the following research hypothesis are presented:

> H_0: Gender diversity in the boardroom is not associated with firm financial performance.
>
> H_1: Gender diversity in the boardroom is positively related to firm financial performance.

According to hypothesis $H_{1,}$ diverse boards are associated with better financial performance. This is in line with the findings of Erhardt et al. (2003) and Carter et al. (2003), who find a positive relationship between female directors and financial performance. The research hypothesis is tested by constructing a cross-sectional data set of 82 firms and conducting a correlation and regression analysis later in chapter five of this paper.

1.3. Construction of the study

The study consists of six main chapters. First chapter starts with the introduction to the research topic and continues by discussing the purpose and motivation of the paper. Furthermore, research hypothesis are presented in the first chapter. Second chapter introduces the concept of corporate governance and corporate governance code as well as national and international legislation regarding publicly listed companies. Third chapter goes through theoretical background with regards to corporate boards and diversity in the board of directors. The concepts of agent theory, agency costs and director independence are discussed briefly. Fourth chapter introduces previous research and empirical findings on board diversity and women in top management. Fifth chapter presents the data set and research method used in the empirical analysis of this paper. Sixth and final chapter, followed by a short conclusion, explores empirical results and provides ideas for further discussion and research.

2. CORPORATE GOVERNANCE

"Global market forces will sort out those companies that do not have sound corporate governance"

-Mervyn King-

As stated by Mervyn King, a British economist and former Governor of the Bank of England, internal corporate governance control is essential for companies operating in the modern business world. With a functioning internal control structure, companies are able to manage potential risks and protect shareholder's investments. If company's internal control structure collapses, the consequences are often devastating. A describing example of failure of internal control is the incident of Enron corporation and former accounting firm Arthur Andersen in the early 2000's. The incident involved one of the largest accounting companies, Arthur Andersen and a large American energy company, Enron, which filed for bankruptcy after the incident.

After the Enron and Arthur Andersen scandal, many countries tightened their law on accounting and national corporate governance policies. In the case of Enron, the board of directors and chairman of the company failed to fulfill their main duty, monitor the operations of the company and its management. The failure of the board of directors to exercise oversight enabled Enron's employees to commit an accounting fraud by exaggerating company's financial performance. In the wake of Enron scandal, directors face greater demands of accountability and they are likely aware to take their roles more seriously. Companies choose directors more carefully and they receive tighter corporate governance recommendations. (Cohan 2002.)

This chapter introduces the definitions of corporations, corporate governance and corporate behavior. Sub-chapter 2.2 discusses national legislation with regards to corporate governance and sub-chapter 2.3 explores Finnish corporate governance code. Moreover, sub-chapter 2.4 briefly introduces international legislation that affects corporate behavior and governance practices.

2.1. Definition of corporate governance

Before introducing the concept of corporate governance, it is reasonable to define the term corporation. Corporation is a legal entity that enables different reference groups such as stakeholders, employees and managers to maximize their benefit in exchange to their contribution for the company. Corporations are separate from their owners and have specific legal rights and responsibilities.

Most well-known, global businesses are corporations. These include famous brands like Apple, Toyota Motor and Mc Donald's. Although they all operate in different industrial sectors, they have few things in common. Firstly, they are all owned by shareholders and the shares are traded in public stock exchange. Secondly, ownership of these companies is separated from the management. These companies have corporate boards and executive officers who are responsible for management of the corporation. Moreover, shareholders or the owners of the corporation are not personally liable for debts.

Monks & Minow (2011) defined a corporation with four main features: *limited liability for investors, free transferability of investor interests, legal personality and centralized management*. *Limited liability* for investors means that there is a separation between owners and employees and the risk of loss for investors is limited to the amount that each of the investors have invested in the company. *Free transferability* of company's stocks enables investors to sell their shares whenever they decide to do so though they only have limited authority over the company. *Legal personality* means that corporations are regarded as legal entities or legal persons in law. Furthermore, registered corporations are owned by shareholders and publicly listed companies' stocks are traded in stock exchange. *Centralized management* of a corporation is divided in two; board of directors are responsible for the overall direction of the company whereas managers take care of the company's daily actions. (Monks & Minow 2011.)

Corporate behavior is directed by internal actors and external mechanisms. On one hand, there are internal actors, responsible for company's future direction. Key internal actors are shareholders, directors and executive officers. External mechanisms, on the other

hand, affect company's behavior and must be taken into consideration in the decision making. Monks & Minow (2011) divided these external mechanisms in to three categories: law, the market and performance measurement.

The Limited Liability Companies Act (Osakeyhtiölaki (624/2006)) and Securities Market Act (Arvopaperimarkkinalaki (746/2012)) are fundamental factors affecting corporations and governance policies in Finland. These two acts are discussed further in chapter 2.2. Moreover, the market and the law of supply and demand, has an impact on corporations. Directors and managers need to take in to consideration for example consumer purchase behavior, the demands from labor unions and public opinion. Firm financial performance affect stockholders and creditors behavior. Without the support and existence of these two reference groups, there would not be corporations in their modern form. Financial markets evaluate company's performance and either decide to invest in the company or withdraw their investments from the company. Corporations are fully dependent on investors. Thus, it is safe to say that performance measurement is a vital external mechanism affecting corporate behavior.

In short, corporate governance is a mixture of all the internal and external factors that affect management of a company. More precisely, corporate governance beholds all rules, practices and processes by which a firm is directed and controlled. According to Shleifer & Vishny (1997), corporate governance is a topic that discusses how investors can make a return for their investment. They state that corporate governance mechanisms are economic and legal institutions that are developed through political processes. These economic and legal institutions include for example national and international legislation, corporate governance code, commodity markets and stock exchanges. Altogether, different reference groups all have an impact on how the company is directed and controlled. Corporate governance is in fact a way to counterbalance stakeholders' interests.

Corporate boards are established to balance interest conflicts between two primary stakeholders of the company, that is, shareholders and managers. Without supervision, managers would be able to spend shareholders' money on things that may not increase

shareholders' wealth. Thus, corporate boards are crucial supervisors between the owners and managers of the company. Furthermore, if corporate boards are not fulfilling their responsibilities effectively, shareholders are not able to expel ineffective managers. Hence, one could say that better boards lead to, at least to some extent, better governance of a company.

2.2. National legislation on publicly listed companies

Publicly listed companies are supervised carefully and corporate law sets special requirements to these companies. Finnish corporate law includes several acts that regulate, for example, composition and tasks of the board of directors and management of the company. Corporate governance is regulated by the Limited Liability Company Act (Osakeyhtiölaki (624/2006), later OYL) and Securities Market Act (Arvopaperimarkkinalaki (746/2012), later AML). Moreover, the Act on Equality (Yhdenvertaisuuslaki (1325/2014), later YhdenvertL) and the Act on Equality Between Women and Men (Laki naisten ja miesten välisestä tasa-arvosta (609/1986), later Tasa-arvoL) set requirements for corporations and influence governance policies. Moreover, complimentary to the provisions of the law, Securities Market Association publishes national Corporate Governance Code for publicly listed companies. The code is introduced separately in chapter 2.3.

Publicly traded companies have special legal requirements which affect the operations of corporate boards. A publicly listed company must publish quarterly and annual reports. Moreover, it must have a CEO and at least three board members. Regulation of corporate boards in Finnish publicly listed companies is determined first and foremost by the Limited Liability Company Act (OYL (624/2006)). As stated in Chapter 1 § 7 (OYL), corporate boards shall treat all shareholders and other stakeholders equally at all times. Chapter 6 of the act consists of 28 sections that discusses management of corporation and corporate boards. Chapter 6 § 1 states that a corporation shall have a corporate board. Thus, all publicly listed companies are required to have a board of directors without exceptions.

Chapter 6 § 2–7 (OYL) discuss the tasks of corporate boards. In short, corporate board is responsible of governance, accounting and financial management of a company. Moreover, the opinion of the majority constitutes board decisions, that is, when more than half of the directors are present. A director can be disqualified from the decision-making if he or she would derive essential benefit and it is contrary to the interests of the company. Chairperson of a corporate board is responsible for organizing a board meeting when necessary. Minutes of the meetings shall be kept by the chairperson.

Sections 8-14 discusses the requirements regarding members of the board of directors and the beginning and end of a membership. According to section 8, there shall be 1 to 5 regular board members unless otherwise decided in the articles of association. The board of directors shall elect a chairperson if there are two or more members in the board. Section 9 states that board members are appointed in the general meeting or, if stated in the articles of association, by the supervisory board. According to section 10, there are few restrictions regarding the members of a corporate board. Legal persons, minors, persons under guardianship, persons with restricted legal competency or bankrupts cannot be appointed as a board member. Moreover, at least one board member shall be a resident of the European Economic Area unless restriction is granted by the local authority. In publicly listed companies, the term for a director of the corporate board shall end as the general meeting following the appointment of the director has come to an end unless otherwise stated in the articles of association (Section 11). A board member may also resign (Section 12) or be dismissed by the party who appointed the member (Section 13) and be substituted by a deputy member of the board of directors (Section 14).

Sections 15–28 discuss other provisions regarding the board of directors of which sections 17–20 discuss the general duties, provisions and appointment as well as resignation of a managing director. Sections 21–24 discuss duties, provisions and membership of a supervisory board. The main function of the supervisory board is to supervise the administration of the company, i.e. supervise the actions of the board of directors and managing director of the company. Sections 25–28 discuss the representation of the company, mainly performed by the board of directors and sometimes by the managing director.

The objectives of the Act on equality between women and men (Tasa-arvoL) and act on equality (YhdenvertL) are to prevent discrimination of any sort, promote equality and improve the status of women in working life. These two acts apply to both, public and private companies and indirectly to the composition of board of directors. Either way, companies must pay attention to national legislation in gender equality matters. For instance, Chapter 2 § 7 (YhdenvertL) states that it is employer's responsibility to evaluate and improve realization of equality in the workplace.

2.3. Finnish Corporate Governance Code

Corporate Governance Code is a collection of recommendations for Finnish publicly listed companies, published and updated by the Securities Market Association. Finnish Securities Market Association was established in 2006 by the Confederation of Finnish Industries (Elinkeinoelämän Keskusliitto), NASDAQ OMX Helsinki and Finland Chamber of Commerce (Keskuskauppakamari). The goal of the association is to strengthen self-regulation of companies and participate in the preparation of self-regulation standards for listed companies. The recommendations are intended to support good securities market practices, presented in the Corporate Governance Code.

Corporate Governance Code consists of recommendations for the following topics: general meeting, board of directors, committees, managing director and other executives, remuneration, other governance, corporate governance reporting and remuneration reporting. Recommendations V–XIII of the latest Corporate Governance Code of 2016 discuss the propositions related to the board of directors (Securities Market Association 2016.)

Recommendation V states that election of the board shall be executed in the general meeting of the company and according to the recommendation VI the term of office is one year. According to the recommendation VII company shall disclose the procedure applied in the preparation of the proposal for the composition of the board of directors. This recommendation adds transparency of the procedure. Recommendation VIII

contains the requirements for the composition of board. The composition should reflect the requirements set by the company's operations and development stage. The director must have competence and enough time for all the duties. Furthermore, the number of directors should enable the board to accomplish all its duties. Moreover, both genders shall be represented in the board of directors. (Securities Market Association 2016.)

As stated in the recommendation IX, company shall establish the principles regarding the diversity of the board. Diversity may include age, gender, occupational, educational, and international background. According to the Securities Market Association, diversity of the knowhow, experience and opinions offers, for example, a possibility to have more versatile decision-making, good corporate governance and efficient management. Listed companies must issue an annual Corporate Governance Statement. In this statement, companies report their principles concerning board diversity. The statement must contain at least company's objectives regarding both genders being represented in the boardroom, i.e. company's goals regarding gender diversity and progress report in achieving these objectives.

In the 2017 statement, companies must report for the first time, any deviation from the recommendation. This means, that companies need to explain possible lack of women or men in their corporate boards. Gender diversity is a topic of current interest and is widely discussed in the newspapers. Helsingin Sanomat (25.7.2016) for example reported that, while the number of women in the boardrooms of Finnish publicly listed companies has increased over the past years, some companies still have male directors only. Moreover, many companies present superficial explanations for the lack of women in the boardroom although, according to the recommendation, both genders should be represented in the board of directors.

Recommendation X introduces the requirements regarding director independence. According to the recommendation, the board of directors evaluates the independence of each director and majority shall be independent or in other words, is not in an employment relationship or service contract with the company. This topic will be discussed further in chapter 3. Recommendation XI states that the board shall report its work in a written

charter including its main duties and working principles. The report enables company shareholders to evaluate all its operations. Adequate amount of information regarding company's operations adds transparency and diminish the risk of agency costs. While corporate boards are responsible for reporting to shareholders, they shall be allowed to receive enough information from the company.

Recommendation XII states that the board of directors has the right to receive information about business operations, operating environment and financial position. Furthermore, as stated in recommendation XIII, the board needs to collect an annual performance evaluation of its operations and working methods. This evaluation can be either internal reporting or conducted by an external reporter and it can include such things as the composition of the board of directors, efficiency of each of the directors or meeting preparations.

2.4. International legislation

Besides national laws and recommendations, Finnish companies are required to take into consideration international legislation. Companies with subsidiaries abroad need to act by the national legislation of the country where they operate in. Moreover, since Finland joined the European Union in 1995, Finnish companies are regulated by the EU legislation. European Union law is divided in to *primary* and *secondary* legislation of which primary legislation consists of the ground rules. Secondary legislation consists of regulations, directives and other acts. All EU countries need to follow these primary and secondary legislation set by the EU parliament. The commission of the European Union makes proposals for new laws. (European Union 2017).

Commission of the European Union published their latest action plan on company law and corporate governance in 2012. According to the action plan, corporate governance of European companies is mainly in responsibility of companies themselves. However, EU corporate governance framework, including both legislation and *"soft law"*, referring to national corporate governance codes, regulates corporate governance carried out by

European companies. In the action plan, European commission points out that weaknesses in corporate governance of financial institutions played a role in the past financial crisis. Thus, the European company law needs to be modernized. The latest additions to the action plan are; Enhancing transparency, engaging shareholders, and supporting companies' growth and their competitiveness (European Union 2012). The focus of the EU commission with regards to EU company law is to increase external control of public companies and reduce risk of financial losses due to loose corporate governance policies.

3. BOARD OF DIRECTORS AND DIVERSITY

People from diverse backgrounds often provide a more effective board in terms of decision making. Diversity can significantly reduce the risk of groupthink, a psychological behavior including conflict aversion and lack of critical evaluation. This can, in turn, have a negative impact on innovating. Diversity is often regarded as a value-adding feature in any organization. The purpose of this chapter is to introduce the concepts of diversity, board of directors, agent theory and director independence. Furthermore, this chapter discusses advisory and oversight functions, the two fundamental responsibilities of corporate boards.

3.1. Board of directors

The board of directors is a significant component in company's corporate governance. In a publicly listed company, the board is elected to represent company's owners, the shareholders. Moreover, the board of directors is in charge of the company, together with company's shareholders. According to the requirements, each publicly listed company must have a corporate board and it serves as the advisory unit for the management of the company. The duties of board of directors are different to those of the management as directors' responsibility is to advice management on corporate strategy rather than develop it (Larcker & Tayan 2011: 68). Board of directors is not an extension of company's management, they supervise managers' actions and report it to the owners. Board members should always act in the best interest of the company and shareholders.

Larcker & Tayan (2011: 67–68) point out two fundamental responsibilities of the board of directors: advice management and monitor its operations. Board members are usually selected based on their skills in pursuance of successfully advising management in corporate governance matters, hence the advisory function. Furthermore, the board is responsible for monitoring the management of the company to ensure that they are serving best interests of the owners. Board of directors select chief executive officer for the company. Moreover, the board measures and evaluates firm corporate performance.

Corporate board's duties and responsibilities are presented in company's constitution. Additionally, there are several legal requirements regarding corporate boards of publicly listed companies. National requirements regarding boards of the companies listed in the Nasdaq OMX Helsinki stock exchange are presented in chapter 2.2 and 2.3.

Corporate boards hold general meetings, scheduled by the chairman of the board. Traditionally, the CEO of the company serves as the chairman, however, recent trend is that more and more non-executive directors are nominated as the chairmen. Behind this trend is a possible agency problem arising from such dual chairman/CEO of a company. If the company's CEO serves as the chairman for the board of directors, true independence of the board is jeopardized. The control of the information and agenda of corporate board is a genuine challenge for the board of directors. (Larcker & Tayan 2011: 70; Monks & Minow 2011: 261.)

Corporate boards have different committees consisting of directors. Some of the board's responsibilities are designated to board committees. Directors are assigned to these committees based on their personal skills and previous experience. In the US, according to the 2002 Sarbanese-Oxley Act, all publicly listed companies must have at least four committees: audit committee, compensation committee, governance committee and nominating committee. The audit committee is responsible for inspecting company's external auditing process and is the link between the external auditor and the company. The compensation committee sets CEO compensation and advice in the compensation of other senior executives. The governance committee evaluates the company's governance structure. The nominating committee searches for and nominates new directors for the corporate board when board seats become available. Corporate boards can form additional committees, such as financing, corporate social responsibility, science and technology or legal committees. All committees oversee and advice in their specific functions. (Larcker & Tayan 2011: 72–74.)

Finnish publicly listed companies have similar committees as the US counterparties, for instance, audit, nomination and remuneration committees. Members of the committees are often appointed for the committees annually. Committees report the minutes of the

meetings to the board of directors who are further responsible for reporting to the shareholders. Again, the CEO and executive management of the company report their actions to the board of directors. Thus, the decision-making and reporting is divided to several governing bodies.

Board members often come from a business background or have a good understanding of financial reports. According to Monks & Minow (2011: 261), it is common that directors are current or former executives and have held top management positions. Moreover, academics and government officials or military leaders are often represented in corporate boards. Corporate directors tend to hold several directorships at the same time, i.e. to sit in multiple corporate boards simultaneously. According to Fich & Shivdasani (2006), firms with such *"busy board members"* are associated with poor corporate governance. These firms had lower market-to-book ratios and overall weaker profitability than those with board members operating in just one corporate board. Furthermore, Fich & Shivdasani (2006) found out that boards with busy directors who are independent, or in other words, do not exhibit conflicts of interest with any of the stakeholders of the company, were associated with weaker performance and the departure of such board members generated positive abnormal returns. The results of this study question whether, in fact, director independence is important for company's success and rather suggest that board members are more effective when they have more time and full focus on one directorship alone.

3.2. Director independence

Board members are expected to be free from conflicts of interest i.e. exhibit independence. An independent or a non-executive director is a person with no employment or service contract with the firm. Independent director is and outsider with no other connection to the company. According to Monks & Minow (2011: 257), over the past decades, the number of independent directors has increased substantially. One of the objectives of the SOX amongst other regulations regarding publicly listed companies

has been to increase board independence. Europe and Finland follow in the footsteps of the US regulatory agencies by increasing requirements regarding director independence.

The definition of an independent director may have different national variations however, most agree that an independent director shall have no connection to the company besides sitting in the corporate board. Finnish Securities Market Association lists key features of an independent director. These features include:

i) the director has no employment relationship or service contract with the company and hasn't had such relationship for the past three years.
ii) the director receives, or has not received during the past year remuneration for services e.g. consulting assignments, from the company.
iii) the director does not belong to the operative management of another corporation which has had a significant relationship with the company e.g. supplier over the past year.
iv) the director is not the auditor of the company, a partner of the present auditor, or a partner or an employee in an audit firm that has been the company's auditor in the past three years.
v) the director does not belong to the operative management of another company whose director is a member of the operative management of the company (interlocking control relationship).

According to the Finnish CG code (Securities Market Association 2016), Finnish publicly listed companies shall consist mainly of independent directors and at least two of them shall be independent of significant shareholders of the company although it is recommended that most directors hold company shares (Securities Market Association 2016.)

An independent director is considered to be more effective in advisory and oversight functions (Larcker & Tayan 2011: 69). Lack of sufficient supervision of company's management can lead to reckless management and huge financial losses. In Enron's case of 2001, for example, it emerged that the board of directors failed in its oversight function,

eventually leading to a bankruptcy of the corporation (see e.g. Erhardt et al. 2003). Independent boards reduce the risk of such scandals. Director independence is essential, if the board is supervising company's management. However, director independence is rarely easily achieved and, as stated by Adams (2016), particularly challenging to measure.

Although, it is possible to investigate professional and financial connections between directors, companies and management, it is somewhat impossible to define and regulate personal connections of these participants. Monks & Minow (2011) reminded that in many cases, directors and managers have outside-business connections which could alter the independence of judgement. People may share a hobby, for example, or have family ties through common friends.

3.3. Agent theory

Most large firms have a common feature; management and ownership of the company are separated. Shareholders or the owners of the company have representatives, directors, who delegate management of the company to its officers. Such separation of management typically creates conflicts of interests. Shareholders interest is usually maximize their wealth or, in other words, increase the value of earnings per share. Company's management may be more interested to increase their salaries and keep their positions within the company. This fundamental corporate governance issue of different interests of company's stakeholders is called agency problem or agency theory. Agency problem occurs between the company's shareholders and executives who might both have different interests. In general, shareholders interest is maximizing the share value whereas managers may have other interests such as expanding personal career or optimize bonuses.

If both managers and shareholders are utility maximizers, the behavior often leads to a conflict of interest which, in turn, results in additive expense. This concept is called an agency cost. The concept was first introduced by Jensen & Mecklin (1976) and has

thereafter been a fundamental matter in corporate governance. Jensen & Mecklin (1976) defined agency costs as the sum of monitoring and bonding expenditures plus the residual loss. This residual loss is defined as the reduction in welfare experienced by the shareholder as a result of avoidance of duties by the managers.

Corporate law provides different solutions to avoid agency costs or agency problem. Previous findings suggest that corporate boards and their actions play vital role in the battle against agency problem. Boards monitor the actions of firm managers to ensure they act in the shareholder's interests. Boards, for example, report shareholders about any possible issue within the company and advice managers (see e.g. Bainbridge 2012; Larcker & Tayan 2011). Bainbridge (2012) stated that board of directors' duty is to monitor senior management and replace those whose performance does not meet the requirements. However, he pointed out that monitoring is time-consuming work and directors may prefer spending their time on other matters such as leisure. Moreover, board meetings are short and directors may not get enough vital information in order to effectively monitor managers.

Healy & Palepu (2001) suggested that there are few solutions to the agency problem. In addition to having effective and reliable corporate boards, Healy & Palepu (2001) suggested that optimal contracts between principals and agents may, in turn, reduce the risk of agency costs. The suggested contracts are for example compensation agreements and debt contracts which require managers to disclose relevant information enabling investors to monitor pursuance with contractual agreements and evaluate management of firm's resources in the shareholder's interest.

Compensation programs are often reported to increase firm profitability. Mehran (1995), for example, reported that firm performance is positively related to equity-based compensation of managers. Equity compensations, such as options and stocks can encourage managers to increase shareholder's wealth as managers simultaneously increase their own wealth. In fact, Mehran (1995) found out that it is rather the form, not the level of compensation that seems to motivate managers to increase firm profitability.

3.4. Gender diversity

The term diversity describes a condition, where a variety of different elements are presented. Organizational diversity refers to a heterogeneous group of people, organizations employees, with diverse backgrounds. Previous research on diversity issues in corporate governance, present two distinctions of diversity, demographic and cognitive (see e.g. Erhardt et al. 2003). Demographic or *"observable diversity"* contains, among other things, racial, ethnical or political diversity. Furthermore, observable diversity can be based on age and gender. Examples of cognitive or *"non-observable diversity"* are education and personality characteristics. Studies on diversity and firm performance often focus on demographic diversity, perhaps due to difficulties of measuring cognitive diversity. This study focuses on gender diversity, since it is a current topic of interest after the increase of women in corporate boards and top management positions. Furthermore, it is of great importance to evaluate the impact of national recommendations regarding gender diversity on the composition of corporate boards and firm's financial success.

Minorities are often regarded as a quality resource for organizations. Differences in personal characteristics result in broad spectrum of opinions. Gender diversity in the boardroom is continuously discussed in the media due to latest regulations and recommendations concerning gender equality. Organizational diversity and diversity management are trendy topics in financial research and studies on human resources management. Finnish newspaper Kauppalehti (27.6.2014), reported about the latest financial research on companies that are run by female CEOs and board members in an article *"Tutkimus: Naisjohtoiset yritykset muita vakaampia"*. According to the article, female representation in the boardroom may have a positive impact on firm performance perhaps due to the fact that women are generally more responsible than men and ore more often present when in the meetings of corporate boards.

Women are often regarded more conservative and risk averse than men in personal financial decisions (See e.g. Croson & Gneezy 2009; Watson & Mcnaughton 2007). Risk aversion and careful thinking within the boardroom could, in turn, lead to a more stable financial performance, especially during periods of financial crisis. Palvia, Vähämaa &

Vähämaa (2015), for example, found out that banks with female CEOs were less likely to fail during the latest financial crisis than banks that were run by their male counterparts. Palvia et al. (2015) argued that banks with female CEOs and chairmen held more equity capital and had lower default risk, making these banks safer and less risky than those with lower equity capital and greater risk of lenders unable to pay for their financial obligations. Overall, the study results of Palvia et al. (2015) indicate that female representation in management and in the boardroom increase financial stability within financial institutions.

Studies have shown that diversity has a positive impact on company's success. Carter et al. (2003) claimed that diversity has a positive impact on firm value for the following reasons: Firstly, as markets are becoming more diverse, corporate diversity must be in line with this recent trend. Secondly, creativity and innovation increase together with diversity. Thirdly, diverse corporations have wider perspectives which can be effective in problem-solving. Fourthly, diversity in corporate management enhances the effectiveness. Finally, diversity is beneficial in global relationship, when operating for example in a different culture.

Finland is one of the leading European countries in nominating women to top management positions. As reported in the Chamber of Commerce survey (2014), Finland held the European Union record for women represented in the board of directors of listed companies. According to the European Institute of Gender Equality survey on largest European listed companies of 2016, Finland held the 6th position in nomination of women as presidents, board members and employee representatives. In 2016, 30,1 per cent of these seats belonged to women in largest, publicly listed companies. According to the survey, the greatest number of women represented in top management positions with 44,6 per cent belonged to Island. Overall, all five Nordic countries were ranked amongst 7 countries with the highest percentage of women in top positions within largest publicly listed companies. On the contrary, in Malta, only 4,6 per cent of the senior executive positions and board seats belonged to women. (European Institute of Gender Equality). Figure 1 illustrates the composition of board of directors within the largest publicly listed companies of the EU_2015 countries for years 2003 and 2016, respectively.

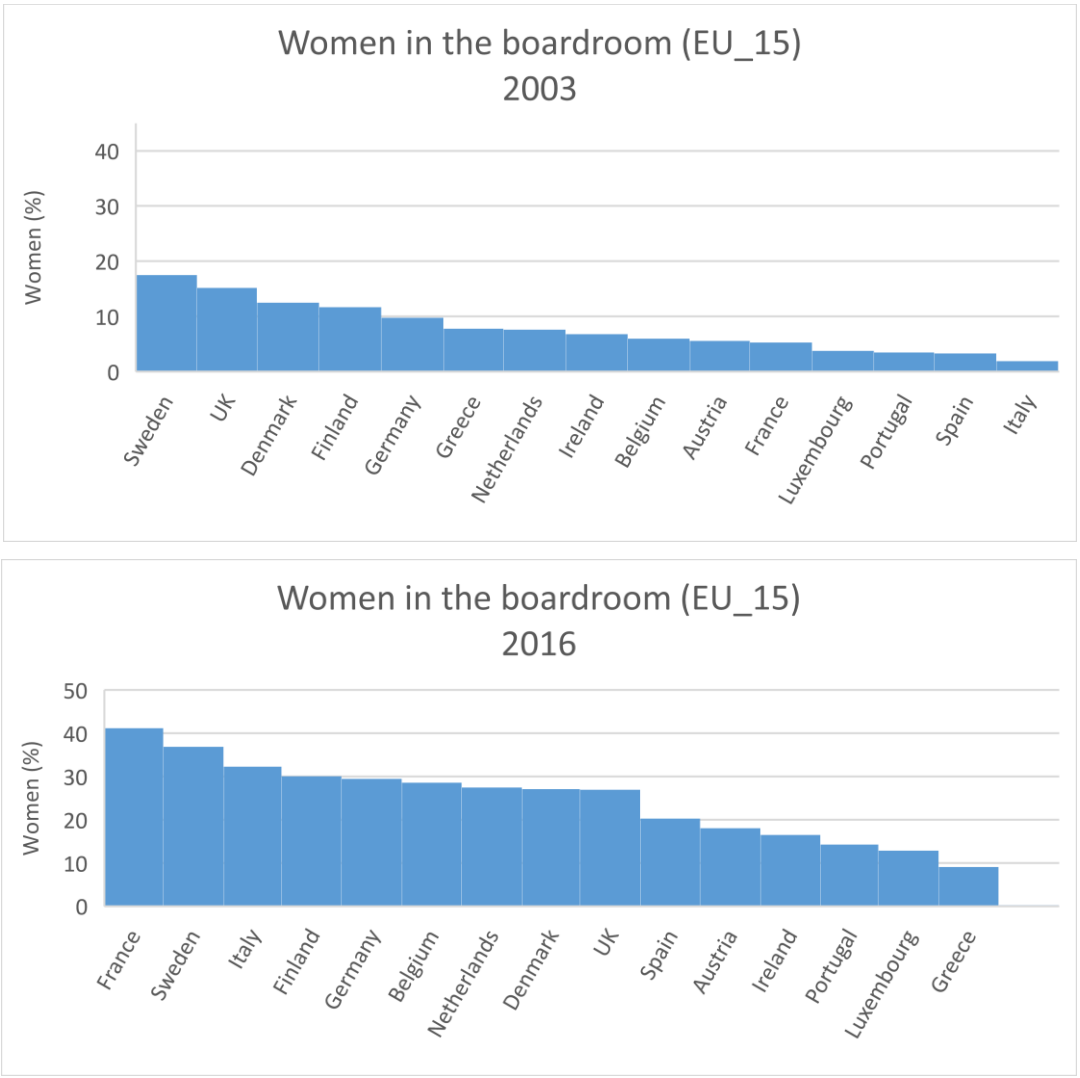


Figure 1. Women in the boardroom of the largest publicly listed companies of the EU_15 countries. Years 2003 and 2016. Source: European Institute of Gender Equality (2017).

The number of women in the boardrooms of European companies has increased drastically between years 2003–2016, illustrated in Figure 1. EU average of women in the board of directors for the largest, publicly listed companies of 2016 is 23,9 per cent whereas in 2003, only 8,5 per cent of the board seats belong to women. Companies' board of directors in France and Italy have experimented the greatest transformation during the past decades. Previously, more than 95 per cent of the board seats in French and Italian companies belonged to men. However, in 2016, over 40 per cent of the board seats in French companies and a little less than 35 per cent of the seats in Italian companies belonged to women. Again, all Nordic countries belong to top half of the EU_15 countries in terms of gender diversity during the period of 2003–2016. Sweden has been

the leading Nordic country in the nomination of female directors for the period of examination.

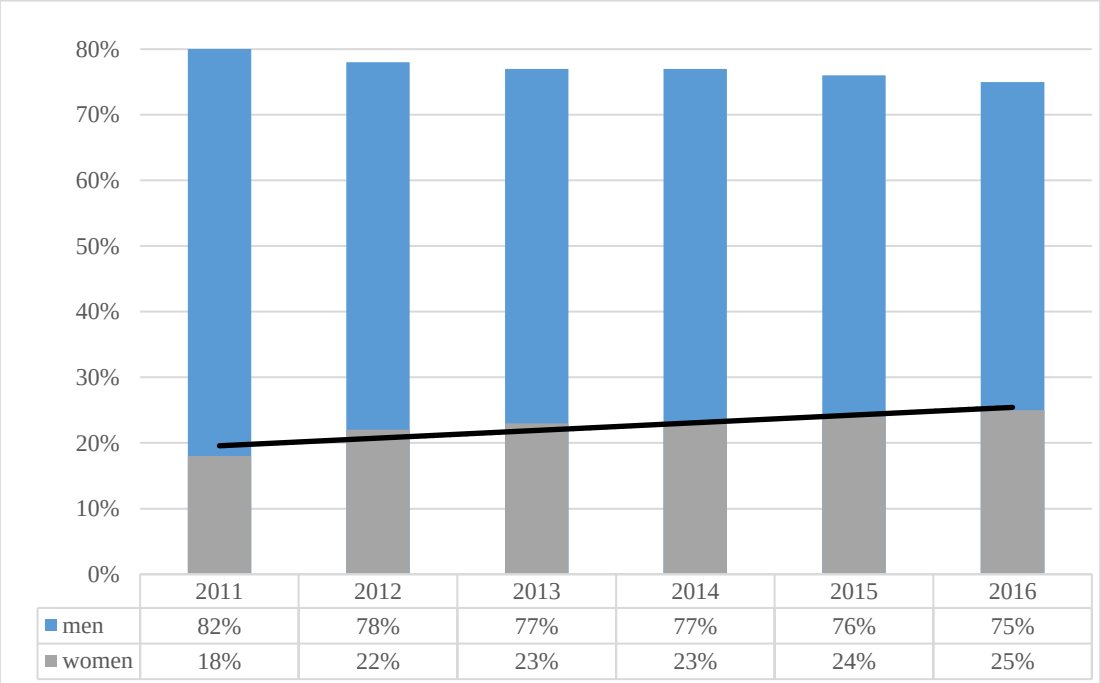
After the latest financial crisis and previous corporate governance scandals, such as Enron and WorldCom, many countries have paid increasing amount of attention to composition of corporate boards. In many previous corporate governance incidents, board of directors played a significant role. In the case of WorldCom, directors had social connections to executive officers and fellow directors, making their ability to represent board independence unachievable and undermined their competence to supervise company's operations. The underlying reason for the WorldCom to collapse was the lack of internal control. (Bainbridge 2012: 59, 141).

Internal control can be improved by increasing board diversity since it is believed that diverse board is more independent and less beholden to management (see e.g. Carter et al. 2003; Kang, Cheng, Gray 2007). Today, an increasing number of policymakers deem that gender diversity in corporate boards is associated with success and better supervision of corporations. Hence, board diversity recommendations are regularly included in national corporate governance policies.

Finnish Chamber of Commerce has published a report regarding women in the boardrooms of Finnish listed companies (Chamber of Commerce 2016). According to the survey, the number of women in corporate boards has increased substantially since 2003, when the first recommendation regarding women as board members was first introduced. In 2003, only 7 per cent of directors in listed companies were women, whereas in 2016, the representation of women in the boardroom was already 25 per cent. Moreover, in 2016, 90 per cent of companies had at least one woman as a member of the board of directors. This is a remarkable increase as in 2008, when an exact recommendation of the representation of both genders was added to the Corporate Governance Code, only 50 per cent of the companies had both genders in the boardrooms. The trend has been consistent as, each year, the representation of women in corporate boards increase. Between 2011 and 2016, the number of women directors has increased nearly a quarter. In 2011, 18 per cent of all directors were women, when in 2016 the representation was already 25 per

cent. According to the Corporate Governance Code of 2016, all publicly listed companies are required to report their principles regarding diversity from the beginning of 2017. Moreover, in Finland, at least 40 per cent of state-owned enterprises must have such composition of the board of directors where at least 40 per cent of board seats belong to women.

According to the latest national program on gender equality, the representation of women in the boardrooms of state-owned enterprises should be around 40–60 per cent by the year 2020 (See e.g. Institutional Repository for the Government 2016). Due to these national recommendations and recent trend in corporate governance, it is assumable that there will be a slight increase in the number of women in corporate boards in 2017. Figure 2 illustrates the composition of corporate boards in Finnish publicly listed companies between years 2011 and 2016.



	2011	2012	2013	2014	2015	2016
men	82%	78%	77%	77%	76%	75%
women	18%	22%	23%	23%	24%	25%

Figure 2. Composition of boards in Finnish publicly listed companies. Source: Chamber of Commerce (2016).

The recent trend in the nomination of women as new board members is positive, however, the number of women in top management positions is still relatively low. The chamber of Commerce report that, in 2017, six publicly listed companies had a woman as chief

executive officer. As a comparison, in 2011 none of the publicly listed companies had a woman as their CEO so there has been a slight increase during the past six years. To date, vast majority of Finnish publicly listed companies still choose men in top management positions.

Evidence from Nasdaq OMX Helsinki stock exchange shows another characteristic of corporate boards; the mean of director age is relatively high, around 55 years. Diversity based on age does not seem to fluctuate over the years. In fact, Helsingin Sanomat (5.8.2016) reported that the average age of a corporate director has increased from 55 to 56 during the past 5 years. Half of the board seats belongs to 50–60 years old directors and over 30 per cent of directors are 60–70 years old. Thus, although many studies have shown that board diversity increases firm profitability, directors still present a homogeneous group of people with similar characteristics. Typical director of a Finnish, publicly listed company is a white, middle-aged man with previous experience in top management positions. (Nasdaq OMX Helsinki 2017; Asiakastieto 2016; Helsingin Sanomat 2016.)

4. PREVIOUS STUDIES

This chapter introduces previous research on diversity issues. The purpose of this chapter is to provide reader an overview of the fundamental studies on gender diversity and firm performance. Furthermore, this chapter introduces both the earliest and the latest findings of studies regarding the representation of women in top management positions and the impact of board diversity on firm performance. The focus is on the different research methods of the previous studies. Chapter 4.1. introduces studies concerning women in senior executive positions and the link between financial performance and diverse management. Chapter 4.2. discusses previous papers on board of director diversity and firm performance.

4.1. Women in top management positions and firm performance

One of the earliest researches on heterogeneity and firm performance is the paper by Murray (1989) which studies the impact of top management group heterogeneity on firm performance. Murray assumed that heterogenic management group increase firm's ability to adapt although he makes an assumption that heterogeneity is negatively related to firm's efficiency. Murray tested these hypothesis on Fortune 500 firms and found significant correlation between short-term performance and management heterogeneity. However, his findings were not overall consistent. The results of the study were altered by the industry, assumed time lag between cause and effect and the measure of performance chosen.

The paper by Shrader et al. (1997) studies the firm-level relationship between women in management and financial performance in the 200 largest US firms in terms of market value. They made an assumption that firms who recruit more women perform better due to being more competitive and more progressive. Thus, they tested for three hypothesis; the percentages of women in management, in top management positions and in the boardroom are positively related to financial performance. They calculated diversity ratios for women in management, women in top management and women in the board of

directors in order to investigate the link between these ratios and financial performance of each of the sample firms.

The performance measures used in the paper by Shrader et al. (1997) are return on sales, return on asset, return on investment and return on equity for the years 1992 and 1993. Control variables in the study are total number of managers, total number of top managers and total number of board members. The results of the hierarchical regression model indicated that women managers of large firms are linked to higher ROS, ROA, ROI and ROE. However, Shrader et al. (1997) did not find positive relationship between financial performance and higher percentages of women in top management or in the board of directors. Their explanation for these results was that there were very few women in top management positions or in the boardroom and such small representation had very small impact in general. Again, they reminded that the sample was extremely homogeneous as it only contained 200 of the largest US firms and their further suggestion was to replicate the study on small and mid-cap firms.

Smith, Smith & Verner (2006) examined the relationship between management diversity and firm performance by conducting a panel study on 2 500 Danish firms. They investigated the impact of women in top executive positions and board of directors on firm financial performance. They used four variables to measure performance; gross profit/net sales, contribution margin/net sales, operating income/net assets and net income after tax/net assets. The sample period was 1993–2001 and it included both public and private Danish companies, the average firm size being 219 employees.

Such large sample and the data set made it possible to control for direction of causality. Smith et al. (2006) defined board diversity in two ways. First measure for board diversity is simply the proportion of women in the board of directors. Second measure for board diversity consists of executive directors and a special group of directors elected by staff members. Smith et al. (2006) measured gender diversity in management by the top CEOs of the company as well as top CEOs and vice-directors of the firm. Control variables in the analysis were industry sector, firm size (number of employees), firm age, and export orientation of a firm.

In the study by Smith et al. (2006), the relationship between performance and number of women in top management was studied by conducting a panel data regression. The results showed a positive and statistically significant correlation between the number of female CEOs and three of the four performance measures. However, the relationship between firm performance and number of women in the board of directors is not obvious as, when the board diversity measure is added to the regression model, only one performance measure coefficient turns out to be positive and statistically significant. Furthermore, an interesting observation of the study was that positive effects of female CEOs on firm performance are related mainly to women with a university degree. Again, female board members, who are elected by the staff, are more prone to have a positive impact on firm performance than other female directors.

Christiansen, Lin, Pereira, Topalova & Turk (2016) investigated the correlation between gender diversity in senior executive positions and firm performance. The study involved two million European companies, both public and private, over the study period. As an interesting notion, Christiansen et al. (2016) reported that, on average, women covered 19 per cent of corporate board seats and 14 per cent of senior executive positions in the top 600 publicly listed firms in Europe.

In the empirical analysis, Christiansen et al. (2016) found a positive relationship between firm performance and number of women in top management positions. After controlling for corporate governance factors, the study results indicated that higher share of female representation in the decision-making team is associated with higher net income, higher profit before taxes and higher EBIT rates. Christiansen et al. (2016) also tested their research hypothesis that gender diversity would increase financial performance in industrial sectors that are predominantly female. According to the findings, the relationship between number of women in top managerial positions and firm performance vary across different industrial sectors. The correlation between positive financial performance and the number of women in senior positions is more pronounced in service, high-tech and knowledge-intensive sectors.

4.2. Board diversity and firm performance

The paper "*Corporate governance, board diversity, and firm value"* by Carter et al. (2003) investigates the link between board diversity and Tobin's Q for Fortune 1000 firms. Descriptive statistics of the final sample of 638 firms in 1997 shows that around half of the corporate boards had just one female board member and one fourth of the boards had no women in the board of directors. When compared to latest findings on both US and European corporations, there has been a substantial increase in the number of women on corporate boards since the late 1990's. For example, the S&P500 firms reported that only around three per cent of the companies had no women in the boardroom and little less than 25 per cent of these companies had just one female director (Catalyst 2017).

Furthermore, Carter et al. reported a certain pattern in the existence of women and minorities in the board of directors in different industrial sectors. According to the study, financial services firms had the highest number of women and minorities in the boardroom whereas mining and construction, as well as travel, entertainment and "other services" had the lowest percentage of women and minorities in corporate boards. Thus, it is reasonable to assume that the number of women varies between different industrial sectors.

In the empirical analysis, Carter et al (2003) estimated the relationship between firm value in terms of Tobin's Q and board diversity. They control for board size, number of annual meetings, CEO/chair duality, director compensation, insider ownership and insiders on board. Furthermore, firm size, ROA and industry dummy are added to the model. The study results show a strong link between firm value and female directors, more precisely, a positive relationship between female director on board and firm size, board size and Tobin's Q. They reported similar results for minority directors and firm value. Moreover, they conclude that the increase of female directors on board is positively correlated with the number of minorities in the board of directors. All in all, these results strongly support the assumption that diverse board of directors is positively related to firm value. Similar

results are provided in the study by Erhardt et al. (2003), who also reported positive association between performance indicators and board diversity.

Campbell & Minguez-vera (2008) investigated the impact of women representation in the board of directors on firm performance of Spanish firms. The study is interesting due to the fact that, in Spain, gender diversity within the board of directors has been amongst the lowest in Europe. In 2015, the average number of women in the boardroom of the largest firms of EU28 was 21,2 per cent when in Spain the number was only 16,8 per cent (European commission 2015). Although there has been an improvement since the publication of the paper by Campbell & Minguez-Vera (2008), where the reported number of women in the boardroom of Spanish firms was as low as 3,1 per cent, the number of female directors is still below EU28 average.

The recent increase of female directors in the boardrooms of Spanish firms is presumably a result from the Spanish legislation of 2000's to improve gender equality. Campbell & Minguez-Vera (2008) tested their hypothesis by conducting a panel data analysis, where the measures of gender diversity were calculated as a dummy variable to represent the existence of at least one female director, the percentage of women in the board of directors and by Blau and Shannon indices. Firm value is measured by Tobin's Q. As a contribution to previous literature, Campbell & Minguez-Vera (2008) studied the causality of the variables involved. In other words, they investigated what is the direction of causality between firm performance and the number of directors. The results show that the impact of the existence of one or more women in the boardroom on firm performance is not statistically significant. However, the findings show a positive relationship between the gender diversity ratio and Tobin's Q as well as between both diversity indices and Tobin's Q. Moreover, the findings suggested that gender diversity ratio has an impact on firm performance and not vice versa.

Rose (2007) investigated the link between performance as measured by Tobin's Q and female representation in the board of directors. In the paper, Rose discusses the advantages of diverse boards on companies. Diversity within a company is generally

linked to good social reputation, heterogeneous group of job applicants and directors as well as better decision-making within the board of directors.

Rose (2007) pointed out that in Denmark, it is especially common that new board members are recruited within a small business circle, closely connected to each other. Such recruitment mechanism is an impediment to improve board diversity as director candidates with better expertise could be eliminated. In addition to the number of female directors, Rose (2007) included variables considering educational background, payment information and ownership for each board member in the empirical analysis. Several other corporate governance control variables are included in the study. The study consisted of a panel data set of Danish publicly listed companies between years 1998–2001. The results of the regression analysis show that the coefficients between the number of women and Tobin's Q as well as the dummy variable for the representation of women in the boardroom and Tobin's Q are both close to or equal to zero. Thus, according to the findings of Rose (2007) gender has no impact on performance. In addition, educational background of the board members has no statistically significant impact on firm performance.

The findings of Adams & Ferreira (2009) are also in contradiction to most other studies investigating the relationship between gender diversity and firm performance. Adams & Ferreira (2009) found a negative relationship between diverse board of directors and firm performance. Adams et al. used a proxy for Tobin's Q and ROA as performance measures. The sample consisted of an unbalanced panel data from 1 939 companies between years 1993–2003. The performance model includes the fraction of women directors, board size and director independence, logarithm of sales, number of business segments, dummy variables for different years and SIC industry code for industry classification.

Adams & Ferreira (2009) found a positive and significant relation between gender diversity and Tobin's Q. However, after adding firm fixed effects to the model, the relationship turned negative but remained statistically significant. They replicated the model for ROA and ended up with similar results. Thus, they suggested that previous

findings on positive correlation between diversity and firm performance are a result of omitted firm-specific factors. Overall, Adams & Ferreira (2009) found that diversity has a positive impact on performance in firms with weak governance but suggested that firms with strong governance policies should not imply gender quotas in the boardroom as it could lead to poorer financial performance.

All in all, many previous papers suggest that there is a link between board diversity and firm performance. Earlier studies examining this relationship are conducted mainly with US data. However, an increasing number of studies on board diversity in European markets are being published. According to the results, there is no significant difference in the findings between the Anglo-Saxon countries where, according to Campbell & Minguez-Vera (2008), investors are more protected, and most European counties where legal system is based on the civil law. However, few studies do not support the belief that increase in diversity leads to improved financial performance. This may be because of differences in empirical models, performance measures or control variables as well as differences in data set.

5. DATA AND METHODOLOGY

This chapter introduces data and methodology used in this study. First sub-chapter describes the data used to conduct the study. Second sub-chapter defines the research method of the analysis.

5.1. Data description

Financial data for this study is collected from Orbis database and it includes public companies, listed in NASDAQ OMX Helsinki stock exchange. Furthermore, national newspaper Helsingin Sanomat was contacted in order to get access to data regarding composition of the board of directors for each of the publicly listed firms. Helsingin Sanomat has previously gathered data regarding gender diversity of Finnish publicly listed firms. The original source of data regarding composition of the board of directors is from the Trade Register collected by the Finnish Patent and Registration Office. The data was obtained from Suomen Asiakastieto Oy by Helsingin Sanomat (Sanoma Media Finland Oy) and gathered for further usage. Access to this data was granted by Helsingin Sanomat to conduct this study. This data involves the number of directors and the representation of women in the boardroom as well as nationality of each director for the Nasdaq OMX Helsinki firms.

The sample includes companies from all industrial sectors represented in the Helsinki stock exchange. During this study, the total of 138 companies are listed in the NASDAQ OMX Helsinki stock exchange of which 25 companies are dropped out due to missing information regarding the sex of each of the directors. Hence, the total number of companies with reported data on gender of the board of directors is 113. Furthermore, as the study involves financial data for each of the companies for years 2011 and 2016, respectively, some companies had to be eliminated from the final sample due to missing financial information. These companies did not report sufficient financial data for the fiscal years of 2011 or 2016. Some companies went public and few of the listed

companies merged together during the period of 2011-2016 thus being eliminated from the sample.

Five of the 87 companies that reported sufficient information, are excluded from the analysis as extreme outliers (ROA and ROE measures >100) as these observations could seriously distort test results. The final sample consists of 82 companies. The final sample of this study holds around 60 per cent of all the publicly listed companies traded in the Finnsih stock exchange during the research period. All companies and the descriptive statistics included in the empirical analysis are listed in Appendix 1.

5.1.1. Performance measures

An effective and simple way to evaluate the success of the board of directors and corporate governance is to measure and compare firm financial performance in terms of rates of return. This study evaluates financial performance by comparing two measures, return on asset and return on equity (hereafter ROA and ROE) calculated for each of the sample firms. Multiple previous studies regarding board diversity use ROA and ROE as the performance measure (See e.g. Carter et al. 2003; Smith et al. 2006; Shrader et al. 1997). These two ratios give an understanding of the return that each company obtains versus the amount of (invested) capital at risk (Asquith & Weiss 2016: 31).

In general, higher ROA and ROE indicate better returns on the firm's investments thus making the firm more fascinating for investors. There are no universal values for these two ratios that would indicate good or bad performance. However, ROE values above 15–20 per cent are often regarded as "good" and for ROA, values above 10 per cent often indicate that the company is performing well (See e.g. Balance consulting / Kauppalehti tietopalvelut). As seen later in Figure 3, there are differences in average ratios between different industries thus indicating that the two ratios are not directly proportional in different industrial sectors. These rates of return are often compared to industry or stock exchange averages in order to get a better understanding of the financial performance of a particular company.

Return on Asset

ROA examines firm profitability as earnings per dollar employed. There are several ways to calculate ROA and no universal definition of ROA exists. The denominator of this ratio is often either company's earnings before income and taxes (hereafter EBIT) or Profit Before Taxes (hereafter P/L before tax). The difference between these two digits is that company's EBIT consists of company's profit before paying taxes and interest on debt whereas P/L before tax or EBT is the difference between EBIT and interest income and expense. (Bodie, Kane & Marcus 2014: 641). Bodie et al. (2014) define ROA as follows:

(1) ROA = P/L before tax / Total assets,

where:

P/L before tax is EBIT minus interest expense plus interest income from the income statement

Total assets are company's total assets from the balance sheet.

EBIT sums up total earnings of a company but ignores liabilities to tax authorities. EBIT takes into consideration all interest expenses coming from debt financing and ignores taxation expenses. (Bodie et al. 2014: 636). P/L before tax is often replaced by net income as is done in this study for simplicity's sake. Orbis database defines ROA in a simplified way (Orbis 2017):

(2) ROA_t = (net income / total assets) x 100

Where:

Net income is company's net income from the income statement;

Total assets are company's total assets from the balance sheet

First definition (1) of ROA is often presented in finance textbooks (See e.g. Bodie et al. 2014). Moreover, some textbooks present ROA as the quotient of after-tax interest and net income divided by total assets (See e.g. Brealey, Myers, Allen 2011). This paper use

a straightforward definition of ROA in the empirical analysis, where the numerator is simply *net income*.

Return on equity

Whereas ROA measures company's profitability with respect to total assets, ROE focuses exclusively on equity. In other words, ROE leaves out any debt-financed assets that the company holds. This ratio is often favored by shareholders as it presents company's return on net income per dollar that shareholders have invested in the firm. ROE is a good indicator for efficiency with which companies utilize shareholders' capital (Jacque 2014: 668) and as such, is an important assessment tool in firm valuation. The definition of ROE is more unambiguous than ROA. In this paper, ROE is defined as (See e.g. Bodie et al. 2014: 642):

(3) ROE = (Net income / Shareholder's equity) x 100

where:

Net income is company's net income from the income statement;
Shareholder's equity is the difference between total assets and total liabilities.

In the income statement, company's net income is calculated as company's earnings before income and taxes or EBIT minus all interest and tax expenses (Bodie et al. 2014: 643). Net income is often the bottom line in the income statement. Shareholder's equity is calculated from the balance sheet and it includes typically all common stocks, preferred stocks, retained earnings and treasury stocks. In other words, shareholder's equity is the amount of equity within a company that belong to shareholders. In Orbis database, ROE is similarly defined as the ratio between net income / shareholder's funds.

The chosen performance indicators, ROA and ROE for the sample firms are reported in Table 1. These two financial ratios are given in the Orbis database and are calculated using financial statements of the sample firms for two years 2011 and 2016.

Table 1. Descriptive statistics for sample firms. Performance measures, ROA and ROE and total assets drawn from the Nasdaq OMX Helsinki firms.

Variable	Mean	Median	Std
ROA_{2011}	5,62	4,56	8,95
ROA_{2016}	4,40	4,03	6,64
ROE_{2011}	11,25	10,77	15,94
ROE_{2016}	8,80	9,78	13,50
$Assets_{2016}$	2 596 957	327 753	7 000 392

Note: Firm performance of the Nasdaq OMX Helsinki firms is presented for fiscal years 2011 and 2016 including all the companies with sufficient financial data. Assets in t€. Number of observations (N=82).

As Reported in Table 1, the average ROA of the sample firms in 2016 is around 4,40 (per cent). The average ROE of the sample firms is around 8,80. These values were below the 2011 level, when the reported average ROA for the sample firms was 5,62 and ROE 11,25. Moreover, in 2016, the median for ROE is 9,82 as in 2011 it was 10,77 and for ROA, 2016 median is 4,03 as in 2011 the reported median was 4,56. According to these statistics and performance measures, the average profitability of the Finnish publicly listed companies has somewhat decreased during the period.

The comparison of financial performance between companies is often conducted for different industrial sectors due to differences in financial ratio averages between industrial sectors. As was assumed, within the final sample of 82 firms, there are differences in ROA and ROE measures between different industrial sectors. Hence, firms in the final sample are classified in to three sub-categories according to their ICB code, defined more precisely in chapter 5.2. The sub-categories are as follows; industrials, goods & services and information technology. Around 44 per cent of the firms belong to a sub-category of industrial companies. Approximately 32 per cent of the firms are consumer goods & services or healthcare providers. 24 per cent of the firms within the final sample belong to third sub-category of information technology.

Figure 3. illustrates the average ROA and ROE of 2016 between different industrial sectors.

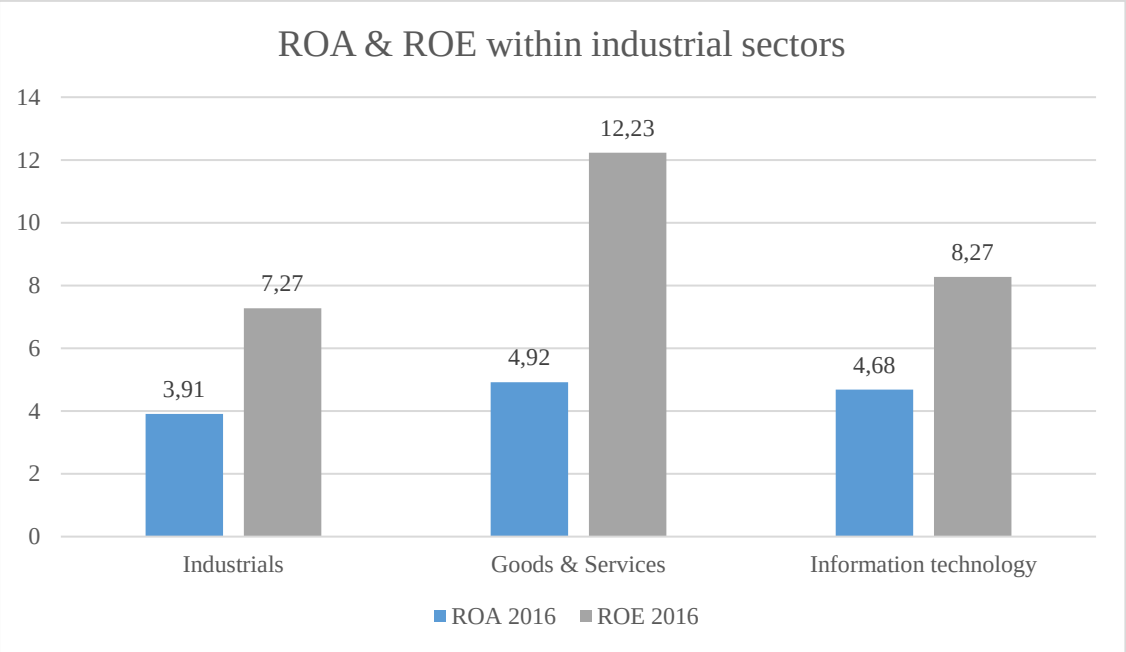


Figure 3. Average ROA and ROE (2016) of the companies in industrials, goods & services and information technology sectors.

The average ROA and ROE of the industrial companies are 3,91 and 7,27, respectively. In comparison, goods and services sector has an average ROA and ROE of 4,92 and 12,23. Furthermore, industrials has the highest standard deviation of ROE, 15,26, whereas the standard deviation of ROE for goods & services sector is 7,89. The standard deviations of ROA for industrials, goods & services and information technology are 5,20, 3,54 and 9,74, respectively. These statistics indicate differences in performance measures within industrial sectors. Hence, it is reasonable to take this into consideration in the empirical analysis as this difference between ROA and ROE measures over different industries could affect the results.

5.1.2. Board composition

Some companies have foreign directors in the boardroom. The gender of these foreign directors is not registered in the financial database of Suomen Asiakastieto Oyj. Hence, an extra search is conducted in order to investigate the gender of foreign directors. Most directors could be found from Bloomberg database which also reports gender of these directors. Despite the massive effort to investigate gender of foreign directors, few

remained unclear. All in all, 14 companies had to be eliminated from this study because the sex of one or more board members remained questionable. The board of directors consists of current members of the board of directors and the chairman of the board. All deputy members are left out from the calculations. Furthermore, company CEOs are not regarded as board members although some of the companies reported CEO duality, that is, the CEO of the company also served as the chairman of the company. In such cases, the CEO (chairman) is regarded as a board member of the company.

Table 2. Descriptive statistics for sample firms. Total number of directors, number of men and women in the boardroom and female directors in percentages (2016).

Variable	Total	Mean	Median	Std	Min	Max
Number of directors	529	6,45	6	1,48	3	10
Men	391	4,77	5	1,14	2	7
Women	138	1,68	2	0,98	0	4
Women (%)	-	25,0	25	12,6	0	50

Note: Number of observations (N=82)

As reported in Table 2, according to the 2016 data, the average number of directors in executive boards is 6,45. The number of the directors varies from 3 to 10. All corporate boards had at least two male directors. On average, a corporate board of Finnish publicly listed companies have around 5 men in the boardroom. However, 14 companies had no women in the boardroom of the company. Moreover, the total number of directors of the 82 firms included in the final sample is 529 of which 25 per cent are women. This finding is constant with the findings of Chamber of Commerce, who also report that 25 per cent of the directors of publicly listed companies are women. As reported in Table 2, the average number of women directors in a corporate board is 1,52.

Figure 4 illustrates board characteristics within different industrial sectors. Board of director statistics for different industrial sectors show minor differences in board composition. In the industrial sector, the average board has 6,33 board members of which 1,67 are women. Gender diversity ratio of these boards is 26 per cent. In goods & services sector, the average board size is 6,25 and women hold 24 per cent of the board seats with

around 1,6 women in each board. Moreover, companies that operate in information technology sector, have, on average, 6,77 directors in the boardroom and 1,77 of the directors are women. The diversity ratio of is 26 per cent. These statistics show very similar compositions of the board of directors over different industrial sectors.

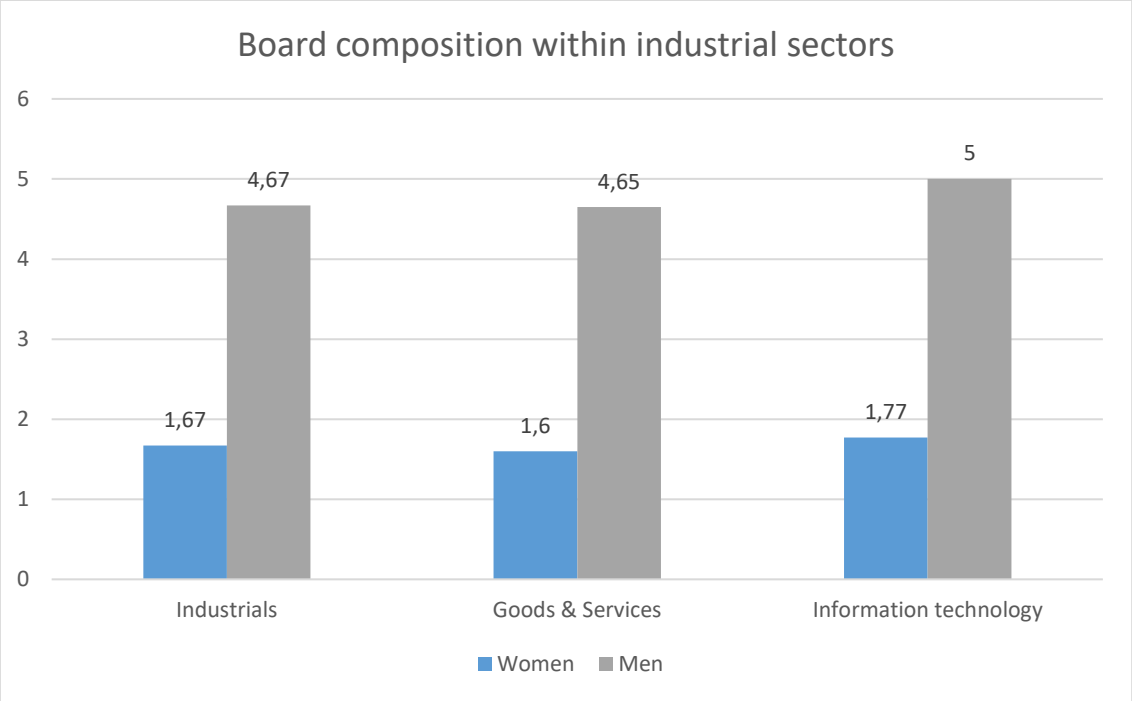


Figure 4. Board composition of the sample firms in industrials, goods & services and information technology sectors.

5.2. Methodology

The empirical analysis in this paper is studied through a panel data analysis. The methodology of this paper follows the previous study of Erhardt et al. (2003) with few changes. Firstly, instead of using US data, this paper investigates the effect of gender in the boardroom on firm performance using evidence from the Finnish stock market. Most previous studies are conducted using data from the US stock market. Secondly, instead of including all minorities in the diversity ratio, this paper focuses on gender diversity. Moreover, some of the control variables are measured slightly differently than those in the paper by Erhardt et al. (2003).

The empirical study is conducted as follows. First part of the empirical analysis examines correlation between independent, dependent and control variables in order to examine the relationships among variables. Thereafter, a hierarchical regression analysis is conducted in order to test for the general hypothesis. The regression analysis demonstrates the effects of the independent variable (board diversity ratio) on the dependent variable (ROA_{2016}; ROE_{2016}) while controlling for ROA_{2011}, ROE_{2011} and industry, board size and total assets. Thus, the empirical analysis consists of altogether one correlation analysis and two regression models for both ROA and ROE as the dependent variable. Furthermore, the regression models include a control variable ROA and ROE at time t-5 to control for market fluctuations. In order to control for market fluctuations, performance indicators, ROA and ROE are chosen at two time points. Moreover, changes in market may have an impact on levels of gender diversity within an organization (See e.g. Richard 2000). This is in line with previous study by Erhardt et al. (2003) where performance is measured at two points in for two reasons; to control for changes in the market and to observe the impact of strategic decision-making on performance. All statistical tests and analysis are performed in Eviews.

5.2.1. Correlation analysis

Correlation analysis examines the relationships between the following variables: Performance measures ROA and ROE ($ROA_{j,t}$; $ROE_{j,t}$), total assets ($ASSETS_{j,t}$), board size ($BSIZE_{j,t}$) and board diversity ($BDIV_{j,t}$) (Descriptions for these variables, see Table 3). The correlation analysis examines whether there is significant, pairwise correlation between the variables used in the empirical analysis. Correlation matrix follows the method suggested by Cohen & Cohen (1983) and later used in the paper by Erhardt et al. (2003). First, correlation coefficients are calculated for each relationship between two of the variables involved. Correlation coefficient describes the linear correlation of the two variables. The correlation matrix, presented in the following chapter, shows if the examined variables exhibit statistical dependence in relation to each other. The convenient method to search for pairwise correlation is to determine Pearson's product-moment correlation coefficient for each two variables. Pearson's correlation coefficient is the covariance of the two variables divided by the product of the standard deviations of

the two variables. Furthermore, covariance of two variables is the average of the products of the deviation score (see e.g. Cohen & Cohen 1983: 30–40). Thus, the correlation coefficient is calculated as follows (Cohen & Cohen 1983: 37):

(4) $$\rho_{X,Y} = \frac{Cov(X,Y)}{\sigma X \sigma Y} \quad ,$$

where:

Cov is the covariance;

σX is the standard deviation of X;

σY is the standard deviation of Y.

After calculating the correlation coefficients, the significance levels are calculated as suggested by Cohen & Cohen (1983: 479–480). The level of significance is determined by the change in the explained variance. The significance level is described by the p-value in the correlation matrix.

5.2.2. Regression analysis

H_1 is examined by conducting a (linear) regression analysis for the cross-sectional data set. Each cross-section unit (company) has one explained or response variable (firm performance) and a corresponding explanatory variable (diversity ratio). The regression model studies the relationship between the explained and explanatory variables for each cross-section unit after controlling for board size, total assets and performance measures, ROA and ROE at time t-5.

The dependent (explained) variables (Y_i) in the regression model are performance measures ROA and ROE at time t ($ROA_{j,t}$; $ROE_{j,t}$). Independent variable (X_i) is the gender diversity ratio ($BDIV_{t,j}$). This ratio is calculated by dividing the number of women in the boardroom by the total number of the executive directors in the company at time t. As previously mentioned, companies with foreign directors are eliminated from the final

sample, as the nationality of these directors is ambiguous. Thus, the gender diversity ratio, presented later in this chapter, is the number of Finnish female directors or female directors living permanently in Finland in relation to the total number of Finnish directors.

Control variables in the regression model are natural logarithm of total assets ($ASSETS_{j,t}$), board size ($BSIZE_{j,t}$) and a dummy variable representing the industry ($IND_{j,t}$). Firm size is an important control variable and it has been recognized to affect the correlation between diversity and firm performance (See e.g. Miller 1991). The study by Erhardt et al. (2003) controls for firm size by using total assets for each sample firm. Adams & Ferreira (2009), use logarithm of total sales as the measure of firm size. As a contribution to the paper by Erhardt et al. (2003), this paper use natural logarithm of total assets as a control variable in order to exclude extreme values from the distribution. Similar technique to control for the size factor is used in other studies on corporate governance (See e.g. Vähämaa & Vähämaa 2012; Carter et al. 2003). Shrader et al. (1997) and Erhardt et al. (2003) control for board size and the same technique is replicated in this paper.

Previous studies have shown that the number of women in corporate boards varies between different industrial sectors (see e.g. Carter et al. 2003) so the possible impact of industry where the company operates in needs to be eliminated. Companies are divided in three sub-categories according to the ICB-code (Industry Classification Benchmark) used in the industry classification by Nasdaq OMX Helsinki stock exchange. The first sub-category includes 36 companies of ICB code 2700 and below, second sub-category consists of 20 companies with ICB-code between 3300–5700 and third sub-category consists of 26 companies with ICB-code 6500 and above.

i) Industrials: oil & gas, industrials and basic materials. ICB $\leq$ 2700. (Industrials).
ii) Consumer goods, consumer services and health care. 3300 $\leq$ ICB $\geq$ 5700. (Goods and services).
iii) Information technology: telecom, technology, utilities and financials. ICB $\geq$ 6500. (Information technology).

The dummy variable takes the number of 1 when the industry sector is the same as where the company operates in, 0 otherwise. For example, if the company is a health care provider, it is operating in the goods and services sector (ICB code between 3300 and 5700). Thus, the dummy variable takes the number of one for this company within goods and services sector.

Performance measures ROA and ROE at time t-5 ($ROAj_{,t-5}$; $ROE_{j,t-5}$) are used to control for changes in the market. The regression analysis involves two following regression models for both performance measures:

(5) $$ROA_{2016} = \alpha + \beta 1 BDIV_{j,t} + \beta 2 ASSETS_{j,t}\, \beta 3 BSIZE_{j,t} + \beta 4 IND_{j,t} + \beta 5 ROA_{2011} + \varepsilon_{j,t}$$

(6) $$ROE_{2016} = \alpha + \beta 1 BDIV_{j,t} + \beta 2 ASSETS_{j,t}\, \beta 3 BSIZE_{j,t} + \beta 4 IND_{j,t} + \beta 5 ROE_{2011} + \varepsilon_{j,t}$$

where:

i is the firm and *t* is time;

ROA is the return on asset;

ROE is the return on equity;

$BDIV_{t,j}$ is the board diversity ratio;

$ASSETS_{j,t}$ is the natural logarithm of total assets;

$BSIZE_{j,t}$ is the total number of executive directors;

$IND_{j,t}$ is the industry dummy (0 or 1).

Table 3. Descriptive statistics for the variables used in the empirical analysis.

Variable	Description	Composition
Independent variable		
$BDIV_{j,t}$	Board diversity ratio	No. of female directors / the total no. of directors
Dependent variables		
$ROAj_{,t}$	Return on asset at time t=1 (2016)	net income / total assets
$ROE_{j,t}$	Return on equity at time t=1 (2016)	net income / shareholder's funds
Control Variables		
$ROA_{j,t-5}$	Return on asset at time t-5 (2011)	net income / total assets
$ROE_{j,t-5}$	Return on equity at time t-5 (2011)	net income / shareholder's funds
$ASSETS_{j,t}$	Total assets	Natural logarithm (ln) of total assets
$BSIZE_{j,t}$	Board size	Total no. of executive directors
$IND_{j,t}$	Industrial sector (Industrials; goods & services; information technology)	Dummy variable: 1 when the industry sector is the same as where the company operates in, 0 otherwise

6. EMPIRICAL RESULTS

The results of the empirical analysis are presented in this chapter for correlation and regression analysis. Both correlation matrix and regression analysis are conducted using Eviews9, statistical program for econometric analysis.

Correlation matrix

The results of the correlation analysis are presented in Table 4. Pairwise correlation coefficients (Pearson) are calculated for the variables. Values for correlation coefficient can vary between -1 and 1. Two variables are perfectly positively correlated if the correlation coefficient is 1 and perfectly negatively correlated if the value is -1. If the correlation coefficient is 0, there is no correlation between the two variables (Heikkilä 2008: 90–91). Hence, the closer the value is to 1, the closer the two variables are to perfect collinearity. Table 4 shows correlation coefficients and p-values for each pair. Probability values for each of the correlation coefficients are presented in parenthesis. P-values represent the level of significance for each of the outcomes.

Table 4. Correlation matrix

Variable	ASSETS	BSIZE	BDIV	ROA11	ROA16	ROE11	ROE16
ASSETS	**1,000**						
	(–)						
BSIZE	0,726	**1,000**					
	(0,000)***	**(–)**					
BDIV	0,344	0,267	**1,000**				
	(0,001)***	(0,015)**	**(–)**				
ROA11	-0,247	-0,116	0,123	**1,000**			
	(0,025)**	(0,299)	(0,269)	**(–)**			
ROA16	0,043	-0,011	0,217	0,013	**1,000**		
	(0,700)	(0,920)	(0,050)*	(0,907)	**(–)**		
ROE11	-0,162	-0,100	0,154	0,933	0,083	**1,000**	
	(0,146)	(0,377)	(0,167)	(0,000)***	(0,459)	**(–)**	
ROE16	0,142	0,077	0,286	0,085	0,883	0,175	**1,000**
	(0,202)	(0,493)	(0,009)***	(0,450)	(0,000)***	(0,116)	**(–)**

Note: P-values for each of the correlation coefficients in parenthesis below
**** Statistical significance at the 0,01 level*
*** Statistical significance at the 0,05 level*
** Statistical significance at the 0,10 level*

As is seen in the correlation matrix, variables are either positively or negatively correlated with each other. This means, that when one variable changes, the corresponding variable changes in the same direction (positive correlation) or in the opposite direction (negative correlation). Control variables board size and assets are highly positively correlated (0,726) at the 0,01 level. Furthermore, as expected, ROA16 and ROE16, as well as ROA11 and ROE11 are highly positively correlated. This indicates that the values for these two performance measures increase or decrease simultaneously. The correlations for the performance measures are highly statistically significant. Thus, according to the results of the correlation matrix, better ROA is associated with better ROE. The results, however, do not explain the causality of these two variables.

Multicollinearity problem is not present in the regression model, as the performance measures are used separately, i.e. one regression model for the relationship between ROA and BDIV and another model for ROE and BDIV. The only explanatory variable, BDIV, is not highly correlated with any of the variables.

Board diversity is marginally positively correlated with assets and the p-value shows high statistical significance. Moreover, the results indicate positive and statistically significant correlation between BDIV and ROE16 (0,286, significance at 0,01% level). In addition, board diversity and ROA16 are positively correlated (0,217) at the 0,10% significance level. These results indicate that there is a positive and statistically significant correlation between firm financial performance and the number of women in the board of directors. Correlation between DIV, ROA11 and ROE11 remained positive but statistically insignificant. Board diversity is positively correlated with board size at the 0,05 level with p-value of 0,015. This indicates that larger boards of directors are also more diverse.

Results from the correlation matrix are similar comparing to the findings of Erhardt et al. (2003) who also find highly significant positive correlation between performance measures (ROA and ROI) measured at time 2. Furthermore, Erhardt et al. (2003) find positive and statistically significant correlation between ROI at time 2 and board diversity. They report marginal positive correlation between board diversity and ROA. The results of the correlation matrix of this study support previous findings of Erhard et

al. (2003) according to which firm performance and board diversity are positively correlated and the study is compatible in both US and Finnish markets.

Regression model

The ordinary least squares (OLS) technique is used to estimate equation and test for the research hypothesis. The regression includes industry dummy for three industrial categories represented in the model as IND1 (Industrials), IND2 (goods & services) and IND3 (information technology). IND3 is the reference group in the estimation. The relationship between explanatory variable (BDIV) and explained variables (ROA16; ROE16) are regressed separately. A t-test is performed and p-values for the test are reported in Table 5 and Table 6. Results of the hierarchical regression models are given in Tables 5–6.

Results of the first regression model (dependent variable = ROA16) are presented in Table 5. In the estimated equation, regression coefficient (β) for board diversity is positive (12,604) and statistically significant at 0,10 level with p-value of 0,054 and t-value of 1,955. The regression coefficient (β) describes the slope of the regression line. One unit increase in the explanatory variable results in (β) unit increase in the explained variable. Hence, when board diversity increases by one unit, firm ROA increases by 12,064 units. The results of the equation indicate that, after regressing board diversity on ROA16 and controlling for board size, natural logarithm of assets, ROA11 and adding industry dummy, diversity is positively related to firm financial performance.

Other (control) variables are marginally correlated with ROA11 but the findings show no statistical significance. Board size is negatively associated with ROA16. ROA11 is also negatively associated with ROA16 and IND1 is negatively associated with ROA16. IND2 and ASSETS is marginally positively associated with ROA16. The estimated equation has relatively small explanatory power (R^2) of 6,1 per cent. However, previous studies on gender diversity and firm performance report relatively small values for R^2 or cumulative R^2 (See e.g. Shrader et al. 1997; Erhardt et al. 2003). Although the goodness of fit value is small, the results of the estimated equation still show statistical significance

at 10 per cent level for explanatory variable (board diversity) and this model has some explanatory power.

Table 5. Hierarchical regression summary: ROA 2016 estimates

HIERARCHICAL REGRESSION SUMMARY			
ROA 2016 ESTIMATES	**(β)**	**(t)**	**p-value**
Constant	3,332	0,634	0,528
Independent variable			
Board diversity (BDIV)	12,604	1,955	0,054*
Control variables			
Board size (BSIZE)	-0,52	-0,676	0,501
Total assets (LNASSETS)	0,143	0,241	0,814
Industrials (IND1)	-1,156	-0,628	0,532
Goods & Services (IND2)	0,058	0,028	0,978
ROA11	-0,023	-0,251	0,802
Estimated equation			
R^2	0,061		
AdjR^2	-0,014		
F-Stat	0,809		0,566

**** Statistical significance at the 0,01 level*
*** Statistical significance at the 0,05 level*
** Statistical significance at the 0,10 level*

Results of the second regression model (dependent variable = ROE16) are presented in Table 6. Results from the second equation follow a similar pattern as results from the first equation. Board diversity (BDIV) is positive and statistically significant at 0,05 level (t-value 2,085). The regression coefficient (β) for board diversity is 26,218. In terms of ROE16, the results show that board diversity is positively and significantly associated with firm performance. When board diversity increases by one unit, firm ROE16 increases by 26,218 units.

Board size is, again, negatively correlated with firm performance, although results show no statistical significance. This indicates that larger boards have a negative impact on firm performance. Furthermore, as expected, assets are positively associated with ROE (no statistical significance). Industrial sector (IND1, IND2) is not statistically significantly associated with ROE16. The results for industry dummy, however, show that financial performance (ROE16), varies between different sectors as IND1 is negatively associated with performance whereas IND2 is positively associated with performance. The absolute value of the difference between IND1 and IND2 is 5,427 for ROE16 and for ROA16 it is 1,214. The explanatory power (R^2) of the second equation is greater than that of the first equation (0,135) and F-stat (1,950) show statistical significance at 0,10 level (0,084).

Table 6. Hierarchical regression summary: ROE 2016 estimates

HIERARCHICAL REGRESSION SUMMARY			
ROE 2016 ESTIMATES	**(β)**	**(t)**	**p-value**
Constant	-7,388	-0,743	0,460
Independent variable			
Board diversity (BDIV)	26,218	2,085	0,041**
Control variables			
Board size (BSIZE)	-0,431	-0,287	0,775
Total assets (LNASSETS)	0,775	0,679	0,499
Industrials (IND1)	-0,749	-0,210	0,834
Goods & Services (IND2)	4,678	1,146	0,256
ROA11	0,133	1,389	0,169
Estimated equation			
R^2	0,135		
AdjR^2	0,066		
F-Stat	1,950		0,084*

*** *Statistical significance at the 0,01 level*
** *Statistical significance at the 0,05 level*
* *Statistical significance at the 0,10 level*

Research hypothesis H_0 and H_1 were presented in chapter 1.1. After estimating two regression models for ROA16 and ROE16 and analyzing the results, null hypothesis (H_0) is rejected and alternative hypothesis (H_1) accepted for the two-side test. The findings of the two regression models support the assumption, according to which gender diversity in the board of directors is positively related to firm financial performance. This finding is in in line with the studies of Erhardt et al. (2003) and Carter et al. (2003) who report positive association between women in the boardroom and firm financial performance.

CONCLUSION

This paper investigated the relationship between gender diversity in the boardroom and firm financial performance within Nasdaq OMX Helsinki firms. The study was conducted by examining financial performance of a cross-sectional data set of 82 Finnish publicly listed companies and gender diversity in the board of directors of these companies with a set of control variables. The data set was analyzed through a correlation matrix and OLS regression model.

The empirical findings of this study support the original assumption of this research that number of women in the board of directors is positively associated with financial performance. The relationship between board diversity, ROA and ROE was positive and statistically significant at 0,10- and 0,05 levels, respectively. Other relationships between research variables remained statistically insignificant. Indeed, the number of female directors seems to have a positive impact on organizational performance. This is in line with previous findings from US and European markets (See e.g. Erhardt et al. 2003; Rose 2007).

There are few limitations in the technique used in this paper. The regression model of this paper does not measure behavioral differences of the two genders and by looking at this paper alone, it is impossible to determine, if the behavior of diverse boards differs from more homogenous boards. Furthermore, the data set of 82 firms is relatively small and it only contains large, publicly listed firms. More studies on different, more heterogeneous group of firms need to be conducted in order to make a more accurate statement that female directors indeed have a positive impact on firm performance. The empirical findings of this study are based on latest financial data. Since data regarding gender representation within the board of directors of the Finnish firms was not easily achievable, this study does not take into consideration the past increase in gender diversity in the boardroom of these firms. It would be interesting to study further, how the changes in the number of female directors affect financial performance by constructing a panel data set of the same 82 firms at different points in time.

An important notation of the limitations of this and other similar studies on diversity and firm performance, is that the relationship between gender diversity and performance is linear. The data set of 82 companies is rather small and the restrictions of the data made it impossible to determine how diversity affected firm performance. According to the results, an increase in diversity ratio results in **(β)** increase in firm performance and stays the same (linear regression). In the model, this increase is described by the regression coefficient **(β)**. Similar notation was pointed out by Erhardt et al. (2003), who speculated that, by adding more data to their research, the relationship between diversity and performance could turn more "curvilinear". This means, that after reaching a certain level in organizational diversity, the additional increase in the number of women (minorities) within the board of directors would lead to an increase in firm performance with decreasing rate. Thus, the benefit from adding a new female board member would increase but with a decreasing pace and will eventually diminish close to zero.

All in all, the findings of this study are interesting and provide useful information for government and other regulatory agencies as well as companies about the advantages of hiring women in top management positions and corporate boards. Female workforce are often disregarded as potential candidates for top positions. However, the findings of latest research suggest that gender diversity is advantageous for companies. Female board members are beneficial for companies and the presence of women in the boardroom seems to, at least to some extent, improve financial performance.

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APPENDIX 1. Companies, descriptive statistics.

COMPANY	BSIZE	MEN	WOMEN	ROA_2011	ROE_2011	ROA_2016	ROE_2016	ASSETS
Affecto Oyj	6	4	2	3.672	8.857	4.020	7.365	117454
Ahlstrom Oyj	7	6	1	0.435	1.425	3.633	9.847	1186500
Aktia Bank Abp	9	5	4	0.257	6.820	0.520	8.042	9485978
Alma Media Oyj	7	5	2	14.848	31.343	5.168	12.246	327000
Amer Sports Oyj	8	6	2	4.994	10.982	4.674	12.651	2715100
Apetit Oyj	6	6	0	3.068	4.176	0.653	1.020	183700
Aspo Oyj	6	4	2	4.944	14.485	5.119	13.843	309736
Aspocomp Group Oyj	4	2	2	44.192	71.727	6.568	9.719	15744
Atria Oyj	8	7	1	-0.624	-1.591	2.000	4.309	909441
Biohit Oyj	6	5	1	52.762	71.358	-25.368	-30.651	12989
Bittium Oyj	5	4	1	-4.624	-7.946	2.286	2.683	153292
CapMan Oyj	5	4	1	7.649	12.351	6.049	10.691	252694
Cargotec Oyj	6	5	1	4.763	12.667	3.372	9.018	3736300
Comptel Oyj	5	4	1	10.167	17.452	12.286	25.878	94886
Cramo Oyj	7	5	2	2.086	4.750	5.933	13.195	1155758
Dovre Group Oyj	4	4	0	9.493	15.682	-3.900	-6.465	42794
Elecster Oyj	3	2	1	4.649	11.197	6.269	12.472	50328
Elisa Oyj	7	4	3	10.073	24.068	10.150	26.470	2533000
Etteplan Oyj	6	5	1	7.109	22.769	5.654	14.406	134483
Evli Pankki Oyj	7	6	1	0.652	7.496	1.285	14.859	755010
Finnair Oyj	7	4	3	-3.721	-11.665	3.365	9.930	2528700
Fiskars Oyj Abp	10	6	4	16.624	28.198	3.642	5.254	1760100
Fortum Oyj	8	5	3	7.692	18.366	2.258	3.663	21964000
F-Secure Oyj	7	6	1	13.027	27.488	9.069	20.077	168064
Glaston Oyj Abp	7	5	2	-7.710	-27.326	1.014	2.856	101053
HKScan Oyj	5	3	2	0.806	2.468	-0.632	-1.318	854800
Honkarakenne Oyj	6	4	2	2.472	5.403	-7.195	-21.488	19945
Huhtamäki Oyj	7	5	2	4.619	11.277	6.662	16.199	2874600
Ilkka-Yhtymä Oyj	6	4	2	6.434	12.136	4.928	8.909	125950
Innofactor Oyj	5	5	0	3.749	5.324	2.416	6.826	63587
Investors House Oyj	4	4	0	-1.629	-2.027	8.642	17.363	43589
Kemira Oyj	7	4	3	5.242	10.328	3.503	7.761	2620900
Keskisuomalainen Oyj	8	7	1	12.880	25.098	4.425	10.834	178615
Kesko Oyj	7	5	2	4.332	8.346	2.237	4.637	4407700
Kesla Oyj	5	4	1	6.560	15.050	1.111	3.327	32842
KONE Oyj	8	5	3	13.615	31.756	12.875	36.618	7951300
Konecranes Abp	6	5	1	4.527	15.114	2.458	8.440	1529900
Lassila & Tikanoja Oyj	6	5	1	3.431	7.792	9.585	19.462	452800
Lemminkäinen Oyj	7	5	2	2.794	9.957	3.926	11.387	968000
Marimekko Oyj	6	4	2	5.817	8.652	8.317	14.243	48493
Martela Oyj	7	4	3	2.247	5.092	5.896	13.172	56238
Metso Oyj	8	6	2	5.379	16.832	4.017	9.034	3236000
Metsä Board Oyj	9	7	2	-10.156	-37.295	4.120	8.589	2194200
Neste Oyj	7	4	3	2.173	6.441	12.616	25.007	7443000
Nokia Oyj	9	7	2	-5.005	-15.262	-1.706	-3.652	44901000
Nokian Renkaat Oyj	7	4	3	16.467	26.050	12.745	17.264	1975700
Nurminen Logistics Oyj	5	5	0	-3.544	-9.177	-8.018	-54.937	43854
Olvi Oyj	5	3	2	5.326	10.645	9.983	16.111	328505
Orion Oyj	7	5	2	26.903	41.920	23.426	38.821	1062900
Outokumpu Oyj	9	6	3	-3.329	-8.546	2.404	5.960	5990000
Outotec Oyj	8	6	2	5.579	19.905	-4.856	-13.913	1427000
Panostaja Oyj	6	5	1	0.658	2.829	4.924	12.961	187279
Pohjois-Karjalan Kirjapaino Oyj	7	6	1	5.522	11.302	15.635	22.511	78963
Ponsse Oyj	6	5	1	8.516	18.854	15.156	30.516	301600
Pöyry Oyj	6	5	1	1.216	4.338	-2.963	-10.566	421800
QPR Software Oyj	4	3	1	6.829	17.779	7.216	17.466	7871
Raisio Oyj	5	4	1	4.592	7.776	4.043	6.066	470000
Ramirent Oyj	7	5	2	5.583	13.721	2.660	7.420	830054
Rapala VMC Oyj	6	5	1	4.452	10.886	-0.949	-2.204	316100
Raute Oyj	6	5	1	-2.079	-4.962	9.580	19.534	69767

Restamax Oyj	6	6	0	12.945	37.037	5.742	12.756	97666
Revenio Group Oyj	5	4	1	15.797	23.808	29.428	37.304	18975
Saga Furs Oyj	8	7	1	11.577	20.516	-1.124	-2.754	216955
Sampo Oyj	8	5	3	3.448	11.637	4.347	13.826	37955000
Sanoma Oyj	10	6	4	1.952	6.739	4.252	11.052	2605600
Scanfil Oyj	5	4	1	4.852	9.058	0.034	0.085	266768
Solteq Oyj	6	4	2	5.163	15.088	7.532	22.705	61232
Soprano Oyj	4	3	1	4.521	7.341	3.803	9.661	12281
Sponda Oyj	8	5	3	3.478	9.207	3.513	7.438	3916500
SRV Yhtiöt Oyj	6	5	1	0.996	3.527	1.571	4.695	882486
Suominen Oyj	6	4	2	-2.819	-8.765	4.826	10.666	315628
Technopolis Oyj	6	5	1	4.850	14.150	2.591	6.280	1825123
Teleste Oyj	6	5	1	4.729	11.525	7.291	14.001	162112
Tikkurila Oyj	6	3	3	8.167	18.531	10.836	21.317	410338
Tulikivi Oyj	5	5	0	-4.295	-12.923	-5.697	-17.198	37422
UPM-Kymmene Oyj	10	7	3	2.970	6.125	6.319	10.670	13911000
Vaisala Oyj	7	5	2	4.147	5.699	7.373	10.532	255000
Valmet Oyj	8	5	3	3.277	26.406	2.806	9.368	2958000
Viking Line Abp	7	6	1	2.125	4.570	1.581	3.589	506000
Wulff-Yhtiöt Oyj	4	3	1	1.425	3.963	1.184	2.487	25432
YIT Oyj	5	3	2	3.550	13.506	-0.311	-1.259	2284000
Yleiselektroniikka Oyj	5	3	2	8.602	15.133	7.988	12.422	18040