UNIVERSITY OF VAASA

SCHOOL OF ACCOUNTING AND FINANCE

Noora Tikka

DOES GENDER DIVERSITY IN THE BOARDROOMS AFFECT BANK FINANCIAL PERFORMANCE: Evidence from European banks.

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UNIVERSITY OF VAASA
Faculty of Business Studies

Author:	**Noora Tikka**
Topic of the Thesis:	**Does gender diversity in the boardrooms affect bank financial performance: Evidence from European banks.**
Name of the Supervisor:	**Denis Davydov**
Degree:	**Master of Science in Economics and Business Administration**
Department:	**Finance**
Bachelor's/Master's Programme:	**Master's Degree Programme in Finance**
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ABSTRACT

Traditionally the financial sector has been led by men but during the 21st century gender diversity has increased also in the financial sector. Due to the banks' important role in society, it is essential that banks are governed by a competent board of directors and banks perform well. This study examines the impact of board gender diversity on European banks' financial performance over the period from 2011 to 2017. During this sample period, the percentage of women on the board of directors increased by 90.23 %. Using panel data analysis, I find a statistically significant correlation between the percentage of female board members and banks' financial performance measured by return on assets (ROA) and by Tobin's Q. Furthermore, I find a statistically significant and inverse relationship between the percentage of female board members and banks' financial performance measured by net interest margin. In addition, the impact of Basel III regulation on banks with different level of board gender diversity is examined. Applying the difference-in-differences estimation model, I find that after the prescription of Basel III, banks with a higher percentage of women on their boards had 1.76 % higher values of Tobin's Q. The results of this study suggest that the composition of the board of directors impacts on the bank's financial performance and the development toward more gender diversified boards support the companies' success in the business.

KEYWORDS: gender diversity, corporate governance, bank

1. INTRODUCTION

The amount of research focusing on corporate governance has increased dramatically during the last two decades. Optimal governance can offer several benefits for companies compared to the competitors and this makes the composition of corporate governance essential. The governances' composition and characteristics define corporate governance and impact on corporations operational and financial performance. Historically most of the board members have been men, but over the last few decades the representation of women on the board has increased.

Even though the board gender diversity has become the topic of the academic discussion, most of the board members are still men. The researchers over the world have approached the topic from different aspects. Most of them have ended up in the conclusion that female board members have a significant impact on corporate governance and through that to firm performance. (Carter, Simkins and Simpson 2003, Campbell and Minguez-Vera 2008, Isidro and Sobral 2015, Farrell and Hersch 2005). Nonetheless, there are also studies with opposite results. (Ahern and Dittmar's 2012, Adams and Ferreira 2009). When women and men have been investigated in the field of finance, two major differences between the genders arises. According to the studies, men are more overconfident and take more risk compared to women. (Estess & Hosseini 1988, Schubert & Brown & Gysler & Brachinger 1999, Barber & Odean 2001, Huang & Kisgen 2013, Montford & Goldsmith 2016 etc.). The differences between the genders may explain the differences between outcomes of the diversified boards and the non-diversified boards.

As can be seen from Figure 1 below the percentage of female board members of large European publicly traded banks has doubled during the 2010s. In 2011, the average percentage of female board members was 15.35 % when in 2017, it was 29.20 %. Both percentages are low, but the development toward more gender diversified boards is clearly visible in the financial sector which has historically been dominated by men. Based on the several studies about the gender differences presented earlier, it is important to investigate whether this development in board composition of European banks also impacts on the banks' financial performance.

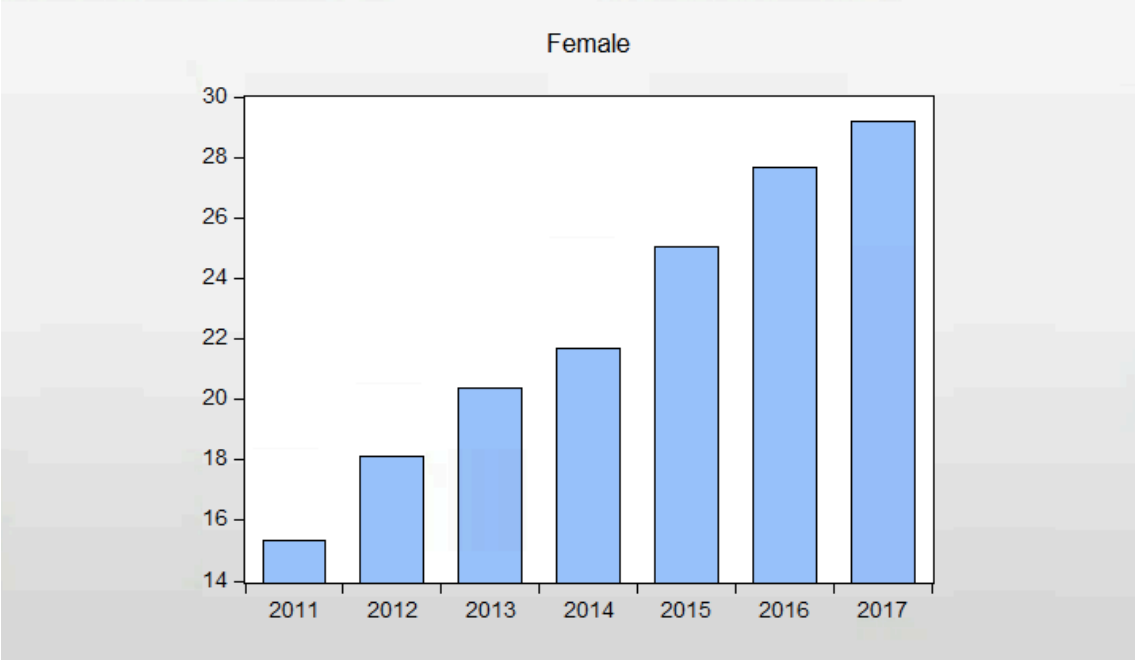

Figure 1. The percentage of female board members in European publicly traded banks with total assets over 25 M Eur.

Figure 2 below illustrates how the percentage of female board members has changed over the period from 2011 to 2017 in different parts of Europe: Nordic Europe (Sweden, Norway, Finland, Denmark), Central Europe (Switzerland, Poland, Czech Republic, Austria, Hungary, Germany), Western Europe (United Kingdom, France, Ireland, Netherlands, Belgium), and Southern Europe (Spain, Portugal, Italy, Greece, Cyprus). As we can see from Figure 2, the proposition of female members on the board has increased in all regions during the selected period of time. The development toward more gender diversified board has been the fastest in Southern Europe. The percentage of female members has increased 178.62 % during the period in Southern Europe while it has increased 68.31 % in Central Europe. The growth has been over double times faster in Southern Europe than in Central Europe. Actually, as we can see from Figure 2, the percentage of female members has slightly decreased after year the 2016.

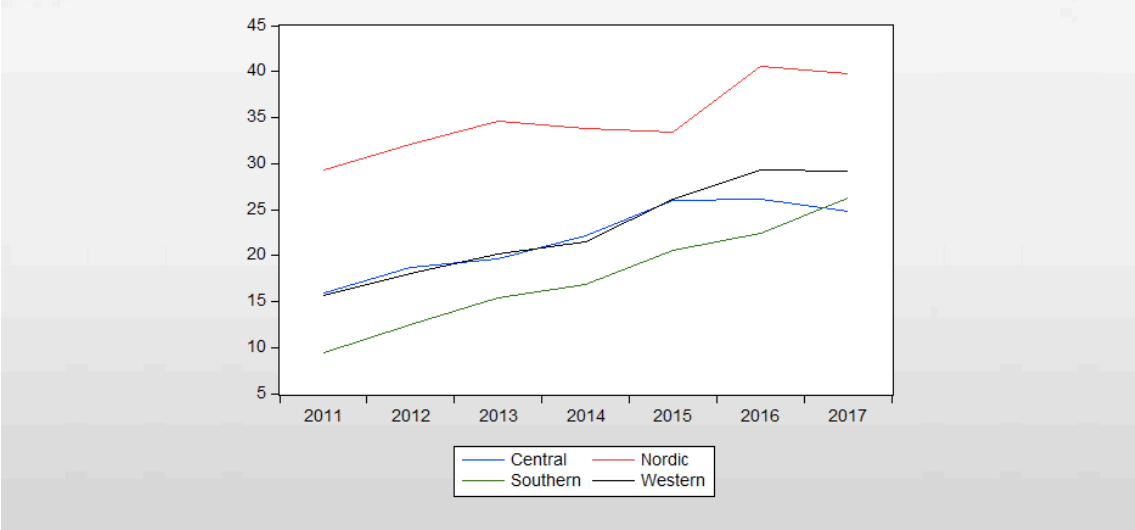

Figure 2. The percentage of female board members in European publicly traded banks by regions with total assets over 25 M Eur.

Most of the studies focus particularly on governance of nonfinancial firms and firms in unregulated industries even if the key aspects of corporate governance are relevant especially among the banking industry. For instance, the problems related to different types of ownership and control issues are relevant in the banking industry and the stakeholders of the financial institutes want to ensure that the assets are allocated effectively. Additionally, informational asymmetries are generally larger in the banking business than in the other industries. (De Andres & Vallelado 2008.)

The banking crisis of 2008 advertises how the poor governance of banks may have enormous consequences to bank performance and through that to the whole economy. Especially, the biggest banks played a significant role during the crisis and problems of the biggest banks spread to the other industries as a domino effect. After the crisis, researchers have been more interested in the banks and banks' position in the economy. For instance, the Basel Committee on Banking Supervision (BCBS) noticed the need for study, understand, and improve the corporate governance of financial institutions. The BCBS agree that corporate governance can improve the soundness of the financial system and the development of countries. (De Andres & Vallelado 2008.)

It is important to understand the differences between the governance of the banking industry and the governance of nonfinancial industry. For instance, the banks face generally larger informational asymmetries, stricter regulation, and more responsibilities when compares to the other companies of the society. (Levine 2004.) Furthermore, the governance of financial institutions is more complicated. The greater amount of parties with a stake in institutions activity lead to more complex corporate governance. Limited competition in both, managerial labor market and product market, may also impact on governance as well as the capital structure. (Adams & Mehran 2003.)

As mentioned earlier, the largest banks play an important role in the economy. They have an enormous impact on financial stability and systemic risk. The importance of the financial stability of the economy has been emphasized during the last decade because of massive costs of the recent financial crisis, the explosive growth of the volume of transactions, and the development of even more complex financial instruments. One of the main factors of the crisis of 2008 was a systemic risk which is the risk associated with the failure or collapse of a firm or an industry. The event at the firm level may trigger the domino effect and the problems may spread from the firm to the whole economy. History shows that the problems, especially in the banking industry, may rapidly spread to the other industries and in the worst case, problems may lead to the world-wide crisis. (Freixas & Laeven & Peydró 2015.)

This study focuses on the largest publicly traded banks in European countries; Austria, Belgium, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, and United Kingdom. The study investigates the impact of gender diversity on the corporate governance of the banks using the panel data analysis. The gender diversity is measured by the percentage of female board members on the board and the bank's financial performance is measured using three different performance measurement; Tobin's Q, return on assets (ROA), and net interest margin. Tobin's Q is a market-based measure for the company's valuation and ROA and net interest margin are the accounting-based measures for the company's profitability.

Also, banks operate in a more regulated environment than most of the other companies. For instance, the Basel Committee stipulated a new law in 2014, Basel III, which sets the international regulatory framework for banks (BIS 2011). Therefore, this study investigates also how bank regulation affects different types of banks: banks with many women on the board and banks with a few women on the board.

As mentioned earlier, most of the previous studies focus on the US market and excludes financial companies. Instead, this study differs from previous studies using recent data of European banks. Furthermore, the previous studies focus on either accounting-based or market-based performance measures. This study brings together both performance measures, accounting-based and market-based.

The results of this study reveal that banks with a higher proportion of female board members are more profitable measured by ROA. More gender diversified banks have approximately 1.02 % higher ROA ratio than banks with only a few or zero women on their boards. In addition, the banks with a higher proportion of female board members are expected to perform better in the future as well and these banks have 0.04 % higher Tobin's Q ratio than banks with a smaller proportion of female board members on their boards on average. However, when the financial performance is measured by net interest margin, the relationship between the percentage of female board members and bank financial performance is inverse. The banks with a higher proportion of female board members have approximately 2.37 % lower Tobin's Q. Studying how the Basel III has impacted on the bank performance in different types of banks: those with many women on their board and those with only a few, the results show that banks with many women on their board (at least 22.82 %) have 1.76 % higher Tobin's Q than banks with only a few women on their boards after the prescription of the Basel III. When the bank performance is measured by ROA or net interest margin, the results are not statistically significant indicating that the impact of Basel III does not differ across the different types of banks.

1.1.The purpose of the study

The primary goal of this study is to empirically examine the impact of female board members in the European banks on bank performance. The study focuses on gender diversity in the boardrooms and how the representation of the female board members affects the bank's financial performance. The bank's financial performance is measured by using both, accounting-based variables and market-based variable. Return of asset and net interest margin represent the accounting-based performance variables and Tobin's q measures the market-based performance. In addition, the impact of Basel III is examined among the different types of banks: banks with many female board members and banks with only a few female board members.

The reason to focus on the largest European banks measured by the total assets is their crucial role in the entire economic system explained earlier. In addition, the nature of the banking business makes the corporate governance problems of banks highly specific and important to research to understand the importance of corporate governance in the banking industry. (DeAndres & Vallelado 2008). Furthermore, European countries are rarely involved in research of corporate governance. Most of the studies use data from the US, the UK, or other singular countries but it is important to notice that the legislation variates between different countries that have an impact on corporate governance. For example, the US, the UK, and Canada have a common-law system when most of the European countries have a civil-law system. (De Andres & Vallelado 2008.)

1.2. The structure of the study

This research begins with the introduction of the purpose of the study and the presentation of the structure. Chapter two focuses on corporate governance. A theoretical framework is stated in the first part of the second chapter. The related theories; resource dependence theory, human capital theory, agency theory, and social psychological theory are introduced in chapter two. In addition, corporate governance in the banking industry is represented in this chapter, as well as, gender diversity in the boardroom and the

definition of how the gender diversity affects the corporate governance and firm value. The relationship between corporate governance and firm value is presented in the last part of this chapter. The third chapter continues by presenting the related literature and stating the hypotheses. The literature review focuses mainly on the effect of gender diversity on firm financial performance. Chapter four consists of the empirical analysis which begins with the presentation of data and variables of this study. Also, the methodology and the regression results are presented in this chapter. This study ends with the conclusions which are presented in chapter five.

2. CORPORATE GOVERNANCE

There is no unambiguous definition of corporate governance. Generally, corporate governance can be defined as the collection of control mechanisms for managing and monitoring the organization. These controlling mechanisms ensure that self-interested managers strive to the welfare of shareholders and stakeholders. The monitoring system includes at least a board of directors that supervises the management and an external auditor that evaluates the reliability of financial statements. However, the monitoring system can also be much broader including shareholders, creditors, regulators, media, investment analysts, labor unions, customers and suppliers. (Larcker & Tayan 2015: 7.)

The institutional structures, legal rules, and best practices constitute corporate governance. These three components of corporate governance also determine which party is empowered to make the particular decisions within the corporation, how the members of that parties are selected, and which norms guide decision making within the corporation. Principles of corporate governance are derived from several sources such as rules of best practices, social norms, and laws. These sources specify the rules and procedures of decision making, the distribution of rights and responsibilities, and how the performance is monitored. (Bainbridge 2012: 2.)

As mentioned earlier, a board of directors is a crucial part of the monitoring system. Besides of oversight role, the board is also expected to provide advisory functions. These responsibilities are focused on different duties even if the responsibilities are linked in many ways. The role of oversight obligates the board to supervise management and ensure that the management is acting in the interests of shareholders. To fulfill its oversight capacity, the board measures corporate performance, evaluates management contribution to performance, awards compensation, hires and fires the CEO (the chief executive officer), and oversees legal and regulatory compliance. In fulfilling its advisory role, the board consults management in the operational and strategic decision making regarding the direction of the company. The most relevant decisions are related to balancing risk and reward. An effective board member has the ability to fulfill both, oversight and advisory responsibilities. (Larcker & Tayan 2015: 57.)

According to the law, the board of directors is obligated to act in the interest of the corporation. This legal obligation is called as a fiduciary duty and it includes three components: a duty of care, a duty of loyalty, and a duty of candor. Directors have to make a decision with due deliberation according to the duty of care. Instead, the duty of loyalty states that shareholders' benefit should be promoted in conflicts of interest. The third duty, the duty of candor, requires that the board of the directors and the management of the corporation inform shareholders of all information that is important when shareholders evaluate corporation and its management. (Larcker & Tayan 2015: 66-68.)

Board members are selected based on their skills and previous experiences in a relevant industry or functions. Typically, the board consists of a mixture of professionals with different managerial, functional, or other specialized backgrounds. Preferred characteristics of a director are current or former senior-level managerial experience (CEO, president, COO, chairman, or vice chairman), international experience, or experience from relevant industry. Corporations might also seek female directors or directors with ethnically diverse backgrounds if they believe that the diversity of personal characteristics can improve and diversify the decision making in the boardroom. (Larcker & Tayan 2015: 57-58, 79-85.) Because the theory of corporate governance suggests that the structure of the board has a strong impact on the actions and management on the board, the structure also impacts on the firm performance. One dimension of the structure is the demographic diversity of the board that also affect the firm performance. (Carter, D'Souza, Simkins and Simpson 2010.)

To affecting the performance of senior executives and to motivate them to create the value of shareholders and stakeholders, executives are compensated for their work. The compensation committee together with the independent directors of the board approve the proposal of the compensation package. This compensation package can be formed from multiple sources such as annual salary, annual bonus, stock options, restricted stocks, performance shares, perquisites, contractual agreements, and other benefits. The compensation package is one of the most important board's tool to affect the senior executives and their commitment to work in the interest of the shareholders, in other

words, to improve corporation's financial performance. (Larcker & Tayan 2015: 211-215.)

2.1.Theoretical framework

Any single theory is not able to explain the relationship between gender diversity on the board and firm financial performance. When combining several theories from various fields, it is possible to create a framework for the hypothesis tested in this study. Theories from economics, organization theory and social psychology are adopted in this study.

2.1.1. Resource dependence theory

According to the resource dependence theory created by Pfeffer and Salancik (1978), the board of the directors can provide the link between the corporation and the external organizations to the corporation. They show that the links to the external organizations can provide four benefits. First of all, these links can offer additional resources such as information and expertise. Second, the links may create the channels for the communication between the corporation and important external organizations and/or groups. The third benefit is the commitments of the support by the important external organizations and/or groups. Fourth, the links may create legitimacy for the firm in an external environment.

The extension of resource dependence theory by Hillman, Cannella, and Paetzold (2000) adds the types of the director to the set of benefits. The different director types are business experts, insiders, community influentials and support specialists. These director types may offer various beneficial resources to the corporation and as a result, the more diversified board may provide more valuable resources the corporation and through that improve the firm performance.

The resource dependence theory offers the basis for the most significant arguments relating to board diversity. A more diversified board may improve the information provided by the directors of the board to the management of the firm. Furthermore, the type of the diversity is significant and female and/or ethnic minority board members may offer unique information as well as the unique talent that can lead to the improved decision making of the management. Diverse directors can also bring new perspectives and non-traditional point of views to the decision making and the problems solving. (Pfeffer and Salancik 1978.)

2.1.2. Human capital theory

Human capital theory, created by Terjesen, Sealy, and Singh (2009) is originally derived from the work of Becker (1964). Becker argues that the person's education, experience, and skills about stocks may offer benefits for the company. For the extension of Becker's work, Terjesen et al. argue that gender has an impact on human capital and women have unique human capital, as well as men have. The argument "the claim that women lack the 'right' human capital for directorships" indicates that women have unique human capital. The evidence shows that women are as qualified as men are in several aspects such as the level of education, but instead, women are less likely to have business expert experience.

The human capital theory takes a stand some arguments that are relating to the board diversity and that is stated in the resource dependence theory. According to the human capital theory, the board diversity impacts on the performance of the board of the directors and result from the director's unique human capital and different demographic factors. However, this impact may be either positive or negative for the firm financial performance. (Terjesen, Sealy, and Singh 2009.)

2.1.3. Agency theory

Agency theory, developed by Coase (1937), Jensen and Meckling (1976) and Fama and Jensen (1983a, b), is a theory about the problem which arises when management and finance, or using more standard terminology, ownership and control are separated in a firm. Agency theory is the most commonly used theoretical framework when studying and analyzing the relationship between board characteristics and firm value in the field of finance and economics. The nature of the problem occurs when parties have different goals or desires. According to the theory, managers may make detrimental decisions related to financing, investments, and payouts if they operate independently. Agency theory is developed to resolve two problems. The first problem relates to the nature of the problem, the difference between the principal's and the agent's goals, and the cost or difficulty of ensuring what the agent is doing. It is problematic for the principal to ensure that the agent acts appropriately. The other problem relates to the risk sharing and it emerges when parties have different attitudes toward risk. This is problematic because different risk preferences may lead to different actions. (Eisenhardt 1989.)

The separation of ownership and control results always costs and these costs are called agency costs. Agency costs can be separated for the monitoring costs by the principal, the bonding costs by the agent, and the residual loss and are almost always greater than zero. (Jensen and Meckling 1976.) Ang, Cole, and Lin (2000) prove with their study that the different ownership and management structures are related to the number of agency costs.

2.1.4. Social psychological theory

Westphal and Milton (2000) provide an opposite view of point. According to the study, demographically minority board members are viewed favorably by the stakeholders, but the literature is more pessimistic to define which group of demographic minorities of the board may successfully impact on the decision-making on the board. Social psychological theory is derived from the social impact theory which suggests that individuals who have majority role, have also disproportionation great amount of influence to effect on the

decision-making process in the group. Thus, the internal group dynamic may prevent the influence possibilities of minority board members.

Westphal and Milton (2000) suggest that the central finding of the literature is that demographic differences between board members may deteriorate the social cohesion of the group. Thus, social barriers may decrease the possibility that the opinion of a minority board member can affect the decision-making process. However, some studies suggest that minority board members can also impact on decision-making and they can improve the divergent thinking in the decision-making processes. According to the study of Campbell and Minguez-Vera (2008), greater gender diversity in the boardroom encourages critical thinking and results in more diverse opinions that lead to more time-consuming and less effective decision-making. When combining the theory and evidence, can be stated that the effect of demographic minority board members may be either positive or negative.

2.2. Banks and corporate governance

The governance of the banks has a central position. If managers are more likely to act in their own interests instead of the interests of principals, the effectivity of the asset allocation of the society may be harmed. Instead, if the bank manages to engage the management to act in the interest of principal, they are more likely to allocate assets efficiently. (Levine 2004.)

Most of the previous studies focus particularly on non-financial firms in unregulated industries. One reason to study only non-financial firms is the complexity of the governance of financial institutions, such as banks. When studying the governance of the banks, have to take into consideration several factors that may have an impact on corporate governance. (Adams & Mehran 2003.) According to the studies of Aebi, Sabato and Schmid (2012) and Levine (2004) financial institutions have heavier regulation and intervention by the government and higher opaqueness that affect also the governance of financial firms. Both, greater opaqueness and government regulation, may weaken

several traditional governance mechanisms. The asymmetry of information caused by the complexity of the banking industry makes monitoring of managers' decisions by stakeholders more difficult. Furthermore, banks are crucial for economic systems. They have a key role also in the payment system and they are generally highly leveraged firms. Additionally, banks protect the rights of depositors, maintain the stability of the payment system and decrease the systematic risk. Because of all these reasons, banks operate more regulated environment than other firms. (De Andres & Vallelado 2008.) Even if the countries do not tend to interfere in other industries, they generally stipulate extensive regulations in the banking industry. The regulations distort the bank's behavior and limit the normal process of corporate governance. (Levine 2004.)

Additionally, regulation can be several other impacts on corporate governance. First, regulation lowers the systematic risk, or it should lower. Even if the lower level of systematic risk can be good for society, it can come into conflict with the main target of the shareholders who have an endeavor to increase the value of the share. The conflict between these two goals generates a new agency problem. Second, regulation may weaken the effectiveness of other mechanisms of corporate governance. Especially, when regulation allows deposit insurances that restrict the supervision of the depositors, or when regulation decreases the number of operations allowed to banks. In addition, when regulation restricts the bank ownership it may have a negative impact on corporate governance and its mechanisms. (De Andres & Vallelado 2008.)

Even if informational asymmetries are observed among all industries, evidence of the study of Furfine (2001) suggests that banks suffer from larger informational asymmetries. Banks are able to change the risk composition of their assets faster than most of the non-financial firms and the quality of the loans is easier to hide for long periods of time. Furthermore, banks can also hide their problems by extending loans to their clients. Greater informational asymmetries can make the designing of the incentive contracts more difficult because the outcomes are difficult to measure, and managers can easily influence outcomes in the short-run. This opaqueness may have a negative impact on competition in labor and product markets, and it can weaken the competition. (Levine 2004.)

Because of the limited competition, heavier regulation than other industries, and higher informational asymmetry caused by the more complex environment of the banking industry, the role of boards as a function of corporate governance of banks is even more relevant. Among the banking industry, the board members should have specific knowledge of the complexity of the banking industry and this knowledge assists them to supervise management and advice management in strategical decisions efficiently. (De Andres & Vallelado 2008.)

Furthermore, Aebi et al. (2012) argue that the role of risk management in the governance structure of financial firms differs from non-financial firms. They examine are the corporate governance mechanism that is related to the risk management related to better bank financial performance measured by ROE and buy-and-hold returns during the financial crisis from 2007 to 2008. Risk management mechanisms that are used in their study are the presence of a chief risk officer (CRO) in a bank's executive board and whether the CRO reports to the board of directors or to the CEO. Their result shows that if the CRO reports directly to the board of directors, the bank performs financially better. Their stock returns were significantly higher and also the ROE was higher level during the financial crisis.

2.3. Gender diversity in the boardroom

Besides of characteristics of financial institutions, also gender diversity may have an impact on board of directors and their style of working. Women can also offer different perspectives to decision making processes and add unique experiences compared to their male counterparts. (Daily and Dalton 2003.) According to the study of Adams and Funk (2012) women are different from men in the boardroom. Their study focuses on all 288 publicly traded firms listed on the OMX and the NGM (Nordic Growth Market) in Sweden in 2005 and their survey includes all CEOs and board members of 288 publicly traded firms. Their findings suggest that female directors have different priorities than their male counterparts and these different priorities can lead to the different behavior of gender diverse boards when comparing to the traditional boards that include primarily

male directors. Their study also shows that female directors have systematically different core values and risk attitudes comparing to male directors. In addition, female directors are more benevolent and universally concerned than male but instead, male directors are more power oriented. Their results also suggest that if the gender composition of the board changes, it may have long-lasting effects on firm and firm performance.

Huang and Kisgen (2011) investigate how the firm financial and investment decisions made by female executives differ from decisions made by male counterparties. Their result suggests that male executives are more overconfident when compared to female executives. For example, men issue debt more often and undertake more acquisitions when compared to women in top management. In addition, announcement returns of acquisitions and debt issues are lower levels when they are made by men.

Even if several studies find evidence that women are more risk-averse and behave more conservative when compared to men (Faccio, Marchica and Mura 2016, Palvia, Vähämaa and Vähämaa 2015), result of the study of Berger, Kick and Schaeck (2014) suggests that changes that lead to a higher proportion of female executives increase bank risk-taking when focusing on banks and banks risk taking. Their empirical analysis covers German banks over the period 1994-2010.

Bilimoria (2006) investigate the relationship between women corporate board directors and women officers. Her investigation focuses on firms listed in the 1999 Fortune 500 list. The main purpose of her study is to investigate if the proposition of woman board directors has positive effects on the gender diversity among senior management of the firm. The findings of this study show that the greater amount of female board directors is significantly and positively related to the gender diversity of senior management. According to the article, female board directors and their visibility in the top level of the firm hierarchy may have an indirect impact on the representativeness of the female executives in other high-level positions.

2.4. Corporate governance and firm value

Several previous studies prove the impact of characteristics of corporate governance on firm financial performance. According to the studies, characteristics such as the size of the board, the board leadership structure, the compensations of the directors, monitoring activity of board, CEO's power, and diversity have an impact on firm financial performance.

Booth, Cornett and Tehranian 2002, Adams and Mehran 2003 and Adams 2009a examine the size of banks and other non-financial firms. They find that banks tend to have larger boards which may lead to problems such as difficulties in the decision-making process.

Staikouras, Staikouras, and Agoraki (2007) examine the correlation between the size of the Board of Directors and firm performance from 2002 to 2004. They focus on 58 large European banks and the particular time period is chosen because they wanted to study if the 1999 Basel Committee Paper on corporate governance for banking institutions may have an impact on the Board structure. Staikouras et al. measure bank performance by using both, market-based variable, Tobin's Q, and accounting-based variables, return of asset (ROA) and return on equity (ROE). After controlling firm-specific variables, they find a significant and negative correlation between the size of the Board of Directors and bank profitability.

When Saikouras et al. focus only on European banks, De Andres and Vallelado (2008) investigate the board of directors of 69 large international commercial banks from six OECD countries; Canada, the US, the UK, Spain, France, and Italy. They find an inverted U-shaped correlation between bank performance measured by firm market-to-book value ratio and board size. Also, a similar shaped relationship is between bank performance and the proportion of non-executive directors. According to the study, the composition and the size of the board of directors impact on directors' ability to monitor and advice management. The results show that the larger and less independent boards may offer several benefits including more effective monitoring and advising role and improved

value creation. Their panel data is obtained from the Board Index from Spencer Stuart and it is from the period of 1996-2006.

Also, Adams and Mehran (2012) focus on the correlation between the size of the Board and firm performance studying publicly traded banks and using 34 years of data. Contrary to the study of Staikouras et al., their study indicates that the size of the Board and the bank performance are positively related. According to the study, one possible explanation for the result is that there are more directors with a subsidiary directorship in larger boards.

Guest (2009) also studies the impact on board size on firm performance. He examines 2 746 listed firms in the UK over the period from 1981 to 2002. He also finds that board size has strongly and negatively correlated with firm profitability measured with Tobin's Q and share returns. Evidence of this study indicates that communication problems and difficulties with decision making can lead the decrease in the effectiveness of large boards.

Coles, Daniel and Naveen (2008) study how the board structure impacts on firm value. They find a U-shaped relation between Tobin's Q and firm size which suggests that the optimal size of the board is either very small or very large. In addition, they find that advising requirements are greater for more complex firms that tend to have larger boards and vice versa, more simple firms have normally smaller boards.

The other broadly researched characteristic of the board is CEO duality. CEO duality means that the Chief Executive Officer is also the Chairman of the Board. The results of the studies relating to the correlation between CEO duality and firm performance are not as straightforward as result relating to the relation between the size of the Board and firm performance. Duru, Iyengar, and Zampelli (2016) examine U.S. firms over the period from 1997 to 2011. They study a board leadership structure and focus on CEO duality. They find the statistically significant and negative relation between CEO duality and firm performance. Their evidence supports the argument that duality might decrease firm

performance. This argument is advanced by agency theorists and also some management scholars.

Fooladi (2011) examine board structure and firm performance. He studies four board characteristics; board independence, CEO duality, ownership structure, and board size. He finds that only CEO duality has negatively correlated with firm performance measured by ROA and ROE. On contrary, other board characteristics are not significantly associated with firm performance. Also, Adams and Mehran (2012) end up to the same conclusion of uncorrelation between board independence and firm performance in banks.

Faleye (2007) research also CEO duality and firm performance. His study ends up with the conclusion that the relationship between CEO duality and firm performance is contingent on the firm and the firm's CEO characteristics. Examining CEO duality and board independence in Malaysian firms over the period 1994-1996 Abdullah (2004) does not find a statistically significant relationship between CEO duality and firm performance, or between board independence and firm performance. His findings suggest that the board structure has no impact on firm performance in Malaysia. Iyengar & Zampelli (2009) also ended up with a similar conclusion.

Additionally, compensations of CEO and directors may have an impact on firm performance. Brick, Palmon, and Wald (2005) study the correlation between CEO compensation, director compensation and firm performance over the 1992–2001 period. They find a highly statistically significant and positive relation between CEO compensation and director compensation. In addition, both, CEO compensation and director compensation are negatively correlated with firm performance.

Powerful CEO can also affect firm performance. The study of Adams, Almeida, and Ferreira (2005) shows that the performance of the firms with greater influence power of CEO is significantly more variable. Their data is collected over the period 1992-1999 from publicly traded firms in the 1998 Fortune 500 and firm performance is measured by Tobin’s Q, stock returns and ROA. According to the study, only if executives can influence the crucial decisions, they can impact on firm performance.

Brick and Chidambaran (2010) examine how board monitoring activity affects firm value measured by Tobin's Q. Instead, board monitoring activity does not impact on firm performance measured by ROA. The results suggest that the main benefit of board monitoring is to help identify investment opportunities instead of to improve current operational performance. They use panel data from 1999 to 2005 and they also notice that the regulatory pressure, especially the Sarbanes-Oxley Act in 2002, raises board activity.

Among other characteristics that impact on firm performance, also gender diversity may have an impact on board composition and through that to firm performance. For example, studies of Carter, Simkins, and Simpson (2003), Campbell and Minguez-Vera (2008), Isidro and Sobral (2015), Farrell and Hersch (2005) have found a statistically significant and positive relationship between greater female representation in the firm and firm performance.

In contrast, there are also studies that support the argument that corporate governance has no impact on firm financial performance. According to the study of Bhagat and Bolton (2007), none of the governance measures are associated with better performance, measured by future stock market performance. Instead, they find a relationship between operational performance and both, CEO-Chair separation and stock ownership of board members.

How to measure the quality of governance can also have an impact on results. According to Brown and Caylor (2004), good governance can be positively or negatively correlated with firm performance. When they measure good governance by using executive and director compensation, the correlation is positive, but in contrast, by using charter/bylaw, the relationship is negative.

3. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Some argue that it is the tokenism that drives the selection of female board members. However, during the last decades, several studies have shown that female board members may have a significant impact on firm performance. This chapter presents the related literature and states the hypotheses which based on the previous studies.

3.1. How greater gender diversity affect firm performance

Adams and Ferreira (2009) also investigate women in the boardroom and their impact on governance and performance. Their result suggests that gender diversity has a significant impact on board governance even if the selection of female board members may be driven by tokenism. They find that female board members are more likely to join monitoring committees and have better attendance records compared to the male colleagues. Additionally, when the fraction of female board members is higher, male counterparties have fewer attendance problems. This suggests that female board members may positively impact also the behavior of their counterparties. More gender diversified boards also have more board meetings. Based on these results, they suggest that women board members have a positive impact on board governance and more gender-diverse boards allocate more effort on monitoring. Board members of more gender diversified boards attendance more often the board meetings and also schedule more board meetings. In addition, a higher percentage of their compensation is equity-based. They ended up the statement that greater gender diversity on the board is associated with negative firm performance, on average. The gender diversity adds firm value only firms with weak shareholder rights that need more monitoring. Their unbalanced panel of director-level data is collected from Standard & Poor's (S&P) 500, S&P MidCaps, and S&P SmallCap firms over 1996-2003.

In addition, Bøhren and Strøm (2010) examine the economic rationale for board regulation in place. They find that when gender diversity is lower firm can create more

value for the owner of the firm. According to their study, politicians should support the idea of less gender diversified boards.

Investigating the gender impacts on the selection of the director serving on the board and analyzing the factors that have an impact on the likelihood of boards adding a new director, Farrell, and Hersch (2005) also find evidence that women tend to serve on better-performed firms. Furthermore, they find insignificant abnormal returns on the announcement of a female director added to the board of directors. Even if the women tend to serve in better-performed firms, adding the female director to the board of directors does not lead the value creation or destruction of the firm. Instead, because of the demand for female directors, women self-select better-performed firms. The demand for female directors may result from internal preferences or external pressures to increase female representation. Their data consists of firms in unregulated industries that are listed on the Fortune 500 or Service 500 lists during the period from 1990 to 1999.

In addition, Peltomäki, Swidler, and Vähämaa (2016) suggest that firm outcomes may be dependent on gender and age of the firm's top executives. They investigate the relationship between age and gender of the firm's top executives and risk-taking among S&P 1500 firms from 2004 to 2014. Among other things, they find a strong positive association between firm riskiness, measured by total and idiosyncratic risk, and female CFO after controlling for incentives of managerial risk-taking, firm-specific attributes, and policy choices. Furthermore, they also find a positive correlation between female CEO and firm idiosyncratic risk. According to their study, the age of CEO (Chief Executive Officer) and CFO (Chief Financial Officer) is associated with lower level of idiosyncratic risk and less volatile stock returns. This result suggests that top-executives become more risk-averse when they become older. Because they state that the age of top executives is positively related to the level of risk-averse, and the female top executives tend to be younger, the effect of executive age on firm riskiness is confused the effect of gender of top executives. In addition, the age and gender of top-executive impact on financial and investment policies of firms.

Bear, Rahman, and Post (2010) investigate whether the number of women on the board of directors impacts on firm corporate social responsibility (CSR) and mediated to the firm reputation. The data is collected from Fortune's 2009 World Most Admired Companies list that based on the survey published in March 2009. The evidence of this study suggests that the number of women on the board is positively and significantly related to the strength of CSR ratings. According to the study of Williams (2003), women may provide several benefits to the board and for example, increase the sensitivity to CSR. In addition, women can bring different decision-making styles and these benefits may lead the improved corporate responsibility strength ratings (Konrad, Kramer and Erkut 2008).

Also, Hafsi and Turgut (2013) study the relationship between boardroom diversity and firm social performance. Their finding suggests that the more diversified boards are positively related to higher firm social performance.

3.2. The effect of gender diversity on firm financial performance

The first null hypothesis of this study can be stated as follows:

H01: Board gender diversity has no impact on bank financial performance measured by market performance (Tobin's Q) and accounting-based performance (ROA and Net Interest Margin).

Carter, Simkins, and Simpson (2003) examine corporate governance, board diversity, and firm value of publicly traded Fortune 1000 firms. Their study focuses on 638 of 1000 firms in 1997. To study the link between board gender diversity and firm financial value, they use both comparisons of means and regression analysis. They measure firm financial performance with Tobin's Q which is a market-based measure. Tobin's Q is defined as the sum of the market value of stock and the book value of debt divided by the book value of total assets. In addition, they control for size, industry, and other corporate governance measures and find that the higher fraction of female board members is significantly and

positively associated with higher firm value. They also find that the fraction of female members increases with board size and firm size but decreases when the number of insiders rises.

Campbell and Minguez-Vera (2008) study gender diversity in the boardroom and firm financial performance. They investigate 68 non-financial firms listed on the continuous market in Madrid from 1995 to 2000. Like Carter, Simkins, and Simpson (2003), they also measure firm financial performance using Tobin's Q instead of accounting-based measures. They find that gender diversity has a positive impact on the value of Spanish firms. In addition, according to the study, the opposite causal relationship is not significant. Most empirical results in this area are based on the U.S. data. Instead, this study offers insight into the relationship between gender diversity and firm performance in Spain. Female participation in the workforce has historically been minimal in Spain, but recently the country has introduced legislation to improve equality of opportunities. Campbell and Minguez-Vera's study shows that investors in Spain, does not avoid the firms with female board members, and greater gender diversity in the boardroom can lead to firm financial performance.

Even if most of the studies find either a positive or negative correlation between board gender diversity and firm financial performance, there are still studies that do not find any statistically significant correlation. Francoeur, Labelle, and Sinclair-Desgagne (2008) study how the participation of female directors improves the firm financial performance and they find no statistically significant differences between firms with a higher proportion of female directors and firms with fewer female directors on the board. Instead, they find a significant and positive relationship between a number of women officers and firm financial performance when firms operate in a complex environment. Firm financial performance is measured by abnormal stock returns and using the Fama and French (1992, 1993) valuation framework. Their finding suggests that the more gender diversified boards are able to generate enough value to enable normal stock returns. The data is collected during the period from 2001 to 2004 and consists of firms in the Financial Post's list of the 500 largest Canadian firms (FP500). However, this study does not address the problem of endogeneity which may have an impact on results.

The study of Carter, D'Souza, Simkins, and Simpson (2010) examine how the number of ethnic minority directors and the number of female directors of the US boards and important board committees affects to the firm financial performance. In the line with Francoeur's et al. (2008) study, they do not find a statistically significant relationship between either ethnic diversity or gender diversity and firm financial performance measured by ROA (return of assets) and Tobin's Q. According to the study, the board diversity does not impact on firm financial performance and the decisions that relate to the appointment of female or ethnic minority director should base on to the other criteria than firm financial performance. Their data is collected during the period from 1998 to 2002 and it contains firms in the S&P 500 index.

Ahern and Dittmar's (2012) study focus on Norwegian firms during the period from 2001 to 2009. In 2003, the Norwegian government legislated the new law which required that 40% of directors of Norwegian firms have to be women. Before gender quota law, only 9% of directors were women. Ahern and Dittmar investigate all public limited Norwegian firms that are traded on the Oslo Stock Exchange (OSE) anytime between 2001 and 2009. The primary goal of their study is to investigate the impact on the firm valuation of mandated female board representation. They also measure the firm value with the Tobin's Q because of the accounting change during the transition period of the quota. They find that the stock prices dropped significantly at the announcement of the law caused by the constraint imposed by the quota. Furthermore, they recognize a large decline in Tobin's Q during the following years. According to their study, the quota led the less experienced board as well as the younger board members, higher leverage and acquisitions, and the decline of operating performance. On the contrary to the other studies, the results of this study indicated the negative relationship between board gender diversity and firm financial performance.

Marinova, Plantenga, and Remery (2015) study how gender diversity affects firm performance in Netherland and Denmark. Their study contains 186 publicly traded firms in 2007 and firm performance is measured by Tobin's Q. They do not find any statistically

significant relationship between gender diversity and firm performance when the performance is measured by Tobin's Q.

Also, Terjesen, Couto, and Francisco (2015) investigate empirically whether greater gender diversity enhances firm financial performance by improving boards of directors' efficiency. The data used in this study includes 3876 publicly traded firms from 47 countries in the year 2010. In line with some earlier mentioned studies, also this study finds a positive and statistically significant correlation between greater gender diversity and firm financial performance measured by Tobin's Q and ROA. They do not consider the problems caused by endogeneity which may affect the results.

García-Meca, García-Sánchez, and Martínez-Ferrero (2015) examine listed banks from nine different countries during the period from 2004 to 2010. They measure bank financial performance also with Tobin's Q and ROA. The results of their study show that gender diversity on the board of the bank increases bank financial performance measured by Tobin's Q and ROA. In addition, the evidence of their study suggests that institutional factors such as investor protection and bank regulation regime play a significant role in this relationship.

Perryman, Fernando, and Tripathy (2016) investigate gender diversity in top management teams and whether gender diversity has an impact on firm performance and firm risk. They measure firm performance with Tobin's Q and used a relatively long time period, from 1992 to 2012 in their study. The data set contains observations from 2566 firms and firms that operate in regulated industries, financial and utility firms, are excluded in their data set. According to their study, firms with greater gender diversity in top management teams perform better and show a lower risk than firms with lower level of gender diversity.

Also, Reguera-Alvarado, de Fuentes and Laffarga (2017) examine the relationship between gender diversity in the boardroom and economic performance of Spanish firms. They measure economic performance by Tobin's Q and their study includes 125 non-financial, publicly listed firms during the period from 2005 to 2009. According to their

study, an increase in the level of female representation in boardrooms is positively correlated with economic success measured by Tobin's Q. In addition, the evidence of their study shows that the number of female board members increased by over 98 % during the investigated period. This increase was, at least partially, affected by gender quota enacted in 2007 which promotes women as boardroom members.

One of the recent researches is a study from Gordini, Niccolò and Elisa Rancati (2017) which focuses on the Italian companies. In 2011, the Italian government enforced a law which prescribes a gender quota for boards of directors. Thereby, the research examines the association between gender diversity in the Italian boardrooms and firm financial performance when the performance is measured by Tobin's Q. Their data is collected during the period from 2011 to 2014 and it contains 918 Italian listed companies. The evidence from this study suggests that the greater gender diversity in the boardrooms does not destroy the shareholder's value and more gender diversified boards may generate economic gains and other benefits for the companies.

Based on the results of the previous studies that measure firm performance with Tobin's Q, the first hypothesis tested in empirical analysis can be formed as follows:

H11: Board gender diversity has an impact on bank financial performance measured by Tobin's Q.

An early study of Shrader, Blackburn, and Iles (1997) investigates the relationship between the percentage of female board members and firm financial performance measured by return on assets (ROA) and return on equity (ROE). Their study consists of approximately 200 US firms of Fortune's 500 firms in 1992. Evidence from some tests of their study suggests that the relationship between the percentage of female board members and firm financial performance is statistically negative.

Erhardt, Werbel, and Shrader (2003) investigate the relationship between board diversity measured by the percentage of female directors or minorities and firm financial performance which is measured by the return of asset and investments. The findings of

the study suggest that board diversity is positively related to firm financial performance. Their data is collected between the years 1993 and 1998 from 127 board of the directors of large US firms. According to the study, board diversity may be related to more effective board's oversight functions. In addition, board diversity may lead to a decrease in agency issues. However, the study does not address the problems of endogeneity which may have an impact on results.

Isidro and Sobral (2015) examine both direct and indirect effects of women on corporate boards on firm value, financial performance, and ethical and social compliance. They study firms included in the Financial Times 2011 classification of the 500 largest European firms from 16 different countries over the period 2010-2012. They do not find evidence that higher female representation on the board has a direct impact on the firm value measured by Tobin's Q. Instead, they find indirect effects between female representation on the board and firm financial performance. According to the study, female board members are associated with better firm financial performance measured by return on assets and return on sales. In addition, female board members are positively associated with ethical and social compliance, which in turn, positively affect firm value.

Low, Roberts, and Whiting (2015) research board gender diversity in Asian firms between the years 2012 and 2013. They study 6952 firms that are listed in Hong Kong, South Korea, Malaysia, and Singapore stock exchange. The evidence of their study suggests that an increasing number of female board members impacts positively firm performance measured by return on assets. However, a positive correlation between greater board gender diversity appears to be diminished if the country has high female representation in the workforce and high female empowerment. These results suggest that gender quotas and forcing female director appointment may lead to reduced financial performance in countries with strong cultural resistance.

One of the most recent study, Owen's and Temesvary's (2018) study about the performance effects of gender diversity on banks boards, uses partly different performance measures as earlier studies. In their study, they apply two measures of overall bank performance, Revenue to Expense Ratio and Return on Assets ratio, and two

more bank-specific performance measures Share of Nonperforming Assets and Ratio of CEO to Average Staff Pay. According to their study, the previous mixed results related to gender diversity and firm performance are due to the fact that this relationship is U-shaped instead of linear. The evidence of their study suggests that the relationship between board gender diversity and bank performance is U-shaped. In other words, the increase of the board gender diversity is positively affected with bank performance until the threshold of the gender level is achieved. However, they find this correlation only with banks which are wee capitalized. Their research focuses on the unbalanced data 168 U.S. banks over the period from 1999 to 2015.

Based on the studies that measure firm financial performance by return on assets, the second hypothesis tested in empirical analysis can be formed as follows:

H21: Board gender diversity has an impact on bank financial performance measured by ROA (return of assets).

Several studies that use return on assets as a dependent variable apply also return on equity in their studies. However, this study focuses on banks that have a regulated amount of equity. Based on this fact, net interest margin is applied instead of return on equity and the third hypothesis tested in empirical analysis is formed as follows:

H31: Board gender diversity has an impact on bank financial performance measured by Net Interest Margin.

3.3. The impact of bank regulation on different types of banks

Also, the impact of Basel III regulation on banks with different level of board gender diversity is examined in this study and the second null hypothesis of the study is stated as follows:

H02: The impact of bank regulation (Basel III) does not differ between different types of banks: banks with many female board members and banks with a few female board members.

Based on the prior literature and the statistical information about the banks, banks have faced large changes in their operative environment which have had inescapable impacts on the banks' corporate governance and other functions as well. For that reason, this study also investigates how Basel III, which is stipulated in 2014 (BIS 2011), affects different types of banks: those with many women on the board and those with only a few. The test hypotheses are stated as follows:

H12: The impact of bank regulation (Basel III) on bank performance measured by Tobin's Q differs between different types of banks: banks with many female board members and banks with a few female board members.

H22: The impact of bank regulation (Basel III) on bank performance measured by ROA differs between different types of banks: banks with many female board members and banks with a few female board members.

H32: The impact of bank regulation (Basel III) on bank performance measured by Net Interest Margin differs between different types of banks: banks with many female board members and banks with a few female board members.

4. EMPIRICAL ANALYSIS

This chapter contains the introduction of the selected data and variables. After the introduction, the methodology of this study is presented. In addition, the last part of this chapter focuses on the empirical findings.

4.1. Data and variables

The sample used in the panel data analysis consists of the unbalanced panel data of the European publicly traded banks for the period 2011-2017. The countries are selected based on the banks' total assets per year and only banks with total assets 25 M€ or over in 2011 are selected to the sample of this study. The European countries involved in this study are Austria, Belgium, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, and United Kingdom. Due to the limitations in the availability of data, the sample contains 65 banks and 602 observations. All selected banks are publicly traded and some of those banks are rated in numerous banks. Due to the several ratings in different banks, the market value which reflects the Tobin's Q differs between different stock exchange for some of the banks. This led to an increase in the number of rated banks that are involved in this study and the total number of rated banks is 86. This means that 21 banks of 65 banks have a different market value in different stock exchange and those banks are listed twice in the dataset of this study. The period from 2011 to 2017 is chosen because of the importance of the recent effect of the board gender diversity on bank financial performance. The accounting, stock market, and corporate governance data used in this study are obtained from ThomsonReuters.

How to measure firm performance differs in prior literature and two different approaches can be found, market-based measures and accounting-based measures. In this study, both approaches are applied, and the study mainly follows the prior literature placing the dependent variables. Tobin's Q is used in some of the latest studies, such as Carter et al. (2010), Campbell and Minquez-Vera (2008), Adams and Ferreira (2009), Reguera-

Alvarado et al. (2017), and Tobin's Q is also used in this study as a measure of the market-based firm performance. Tobin's Q is defined as the sum of the market value of stock and the book value of debt divided by the book value of total assets. Tobin's Q is used to measure the investor's future expectations of the company's value and performance (Demsetz and Villalonga 2001). The companies with Tobin's Q ratio greater than 1.0 are expected to use available resources effectively and through that to create more value in the future. Instead, if the Tobin's Q ratio is less than 1.0 the company is expected to benefit poorly available resources. (Lindenberg and Ross 1981.)

Return on assets and net interest margin measure firm performance from the accounting-based perspective. Particularly, ROA (return on assets) is a widely used measure in prior literature (Shrader et al. 1997; Erhardt et al. 2003; and Isidro and Sobral 2015). The return on assets is defined as net income (before extraordinary items) divided by the total value of assets and it measures a company's profitability in relation to its total assets. In other words, ROA measures how efficiently the company's resources are utilized to generate income.

Several studies, such as Shrader et al. (1997), Staikouras et al. (2007), and Furthermore et al. (2012) use return on equity (ROE) to measure firm performance from accounting-based perspective. However, this study focuses on the banks instead of companies in the other industries and banks have a regulated amount of equity. Due to the regulations, net interest margin is applied in this study to measure firm performance by accounting-based measure, together with ROA. Net interest margin is defined as investment returns minus interest expenses divided by average earning assets and it measures a bank's success to invest its funds in relation to its expenses on the same investments. It is the gap between the interest incomes of the loans and securities that banks are received and the interest expenses of the bank's borrowed funds. Generally, the higher net interest margin ratio of the bank, the higher the bank's profitability is, and the more stable the bank is. This causality makes net interest margin ratio as one of the key profitability measures of the banks. (Ongore and Kusa 2013.)

There are numerous sources of motivation to use Tobin's Q together with accounting-based measures, ROA and net interest margin. First, Tobin's Q measures investors' expectations of the future and for that reason, it is a good proxy for a competitive advantage of companies (Montgomery and Wernerfelt 1988). It also explains the risk and focuses on the future's expected performance (Demsetz and Villalonga 2001). In addition, Tobin's Q is less sensitive for asset valuation principles that are managed by the company's management (Montgomery and Wernerfelt 1988). While Tobin's Q focuses on the future, the accounting-based measures count the company's prior performance and based on the events that have already occurred. Also, accounting-based ratios are important determinants when explaining the company's value-adding which affects to the firm performance. For instance, ROA measures produced accounting incomes to the shareholders and net interest margin measures how successfully the company has invested its funds. When applying both, market-based variable and accounting-based variables, the different aspects of firm financial performance can be captured.

The independent variable of the regression, Women %, indicates the percentage of women on the board of directors which is widely used in the literature (Adams and Ferreira 2009; Campbell and Minquez-Vera 2008). The lagged variable is used to capture the effect of earlier changes in the percentage of female board members.

Based on prior research, several country, firm, and board level control variables are defined. Size of the company is normally used as a control variable in the studies which examine the firm performance due to the fact that company's size is one of the main determinants of company value and company performance. Among other things, the company's size is related to its market returns (Fama and French 1992). Also, size is associated with greater monitoring costs due to the complexity of the bigger companies. The negative correlation between size and company performance is expected based on the results of prior literature (Carter et al. 2010; Campbell and Minguez-Vera 2008; Adams and Ferreira 2009; Isidro and Sobral 2015). In this study, the size of the company is measured by the natural logarithm of total assets. Even if the several studies have added firm age as a control variable, in this study, the firm age is excluded from the set of control

variables due to the statistically insignificant results in the previous studies (Low et al. 2015; Isidro and Sobral 2015).

Leverage ratio measures a company's debt level and it is measured by total debt to total assets. Debt is an important mechanism to force directors and managers to generate free cash flows to payments of the principal and interest. Thereby debt is one of the mechanisms for decreasing the agency conflicts (Isidro and Sobral 2015). Based on the previous researches, such as Campbell and Minguez-Vera (2008) and Isidro and Sobral (2015), the association between debt level and firm performance is expected to be negative.

Non-performing loans ratio measures a company's non-performing loans to its total loans. The studies, such as Kolapo et al. (2012) and Ghosh (2015) find the negative relationship between the bank's non-performing loans level and profitability measured by return on assets. Also, in this study, this correlation is expected to be negative. Deposit ratio measures a bank's profitability and it is defined as a bank's total deposits divided by its total assets. The relationship between the deposit ratio and bank financial performance is expected to be a positive based on Trujillo-Ponce's (2013) study. Loans to deposit ratio measures banks liquidity as well as banks credit risk. It is measured by total loans to total deposits and the higher the ratio is, the higher the risk for illiquidity and insolvency is. (Samad & Hassan 2006.) The correlation between loans to deposit ratio and bank performance is expected to be negative based on the outcome of the study of Arif & Anees (2012).

Previous researches find that the leadership structure of the firm has an impact on firm performance. In this study, leadership structure is measured by placing a dummy variable of CEO duality. CEO duality dummy represents if the position of the firm's CEO and the chair of the Board are combined. The association between CEO duality and firm performance is widely examined but as mentioned earlier, the results are not straightforward. Numerous studies (Adams et al. 2005; Faleye 2007; Adams and Mehran 2012) do not find a significant association between CEO duality and firm financial performance. However, there are also studies (Fooladi 2011; Dury et al. 2016) which find

a negative and statistically significant correlation between CEO duality and firm performance. Based on these results, the association is expected to be negative.

Board size measures the number of board members. Optimal board size may improve firm financial performance. Numerous studies (Agrawal and Knoeber 1996; Eisenberg et al. 1998; Mak et al. 2005; Guest 2009) find the negative correlation between the firm size and its financial performance. These results suggest that the smaller board size may be optimal for firms. Based on the results of these studies, the impact of board size is expected to be negative.

Independent % measures the percentage of independent board members. De Andres and Vallelado (2008) state in their study that less independent boards may offer several benefits to firms including more effective monitoring and advising role and improved value creation. However, some of the studies (Bhagat and Black 2001; Faleye 2007; Fooladi 2011) do not find any statistically significant correlation between a board with a higher percentage of independent board members and firm performance. In this study, the association is expected to be positive.

In addition, the number of board meetings is controlled because previous studies find a statistically significant correlation between the number of board meetings and firm financial performance. Vafeas (1999) find a negative association between board meeting frequency and firm performance when Ntim and Osei (2011) find that either relatively small or large number of board meetings is positively correlated with firm performance. Based on these mixed results, the correlation is expected to be statistically significant, but the direction can be either negative or positive.

Following the previous studies such as Adams and Ferreira (2009), Carter et al. (2010), Ahern and Dittmar (2012), country dummies, year dummies, and bank fixed effects are applied in the study. In addition, all control variables are lagged one period in order to capture the effect of earlier changes. One-year lag is used because Carter et al. (2010) argue that the results from one-year lag and two-year lag are essentially the same.

In the difference-in-differences estimation model, three dummy variables are used. A dummy variable of DLawYear indicates whether the Basel III has already stipulated or not. Basel III stipulated in 2014 and all years before the year 2015 get the value of 0. The years 2015-2017 gets the value of 1. A dummy variable of DWomen indicates the representation of female board members. Banks with less than 22.82 % women on their boards belong to the group of "only a few women in the boardroom" and these banks get the value of 0. The banks with 22.82 % or more women on their board belong to the group of "many women in the boardroom" and get the value of 1. This allocation based on the mean value of the percentage of female board members which is presented in Table 3. The third dummy variable, the dummy variable of DInter indicates the interaction between these two previously mentioned dummy variables.

4.2. Methods

Following Carter et al. (2003), the association between board gender diversity and bank financial performance is examined using both, the univariate test of means and the panel data analysis. Using the panel data method, firms from different countries with the different institutional environment are included in the sample which allows the elimination of unobservable homogeneity and biased omitted variables among the companies in the sample (Campbell and Minguez-Vera 2008). In addition, increased heterogeneity affects positively to the robustness and generalization of the results. Thus, a more reliable picture can be formed using the panel data analysis if compares to the cross-sectional analysis. Furthermore, the standard errors are adjusted for potential heteroskedasticity by applying the White test and the correlation between the variables is examined by using Pearson correlation test.

When studying the relationship between board characteristics such as the board gender diversity and firm performance, the possible causality problem arises. The direction of causality can be either that the board gender diversity affects the firm performance or that the firm performance effects the board gender diversity. This problem of causality may imply the join endogeneity of variables (Marinova et al. 2016.) Several previous studies

(Adams and Ferreira 2009; Hermalin and Weisbach 2003) suggest that the relationship between most of the board characteristics, including board gender diversity, and firm performance is endogenous.

Several different ways are used to solve the problems caused by endogeneity in previous researches. Following Adams and Ferreira (2009), and Carter et al. (2010), firm fixed effects are applied to solve the problem of endogeneity in this study. Instead, Carter et al. (2003), Campbell and Minguez-Vera (2007), and Carter et al. (2010) use two-stage (2SLS) or three-stage (3SLS) least squares instead of OLS to address the problem of endogeneity and some studies (Dittmar 2012; Reguer-Alvarado et al. 2017) use instrumental variables which are only correlated with percentage of female board members, but which are uncorrelated with bank performance.

Following Adams and Ferreira (2009) and Low et al. (2015) the hypotheses are tested by applying the ordinary least squares (OLS) regression equation. In the analysis, the regression is utilized to examine whether the percentage of female board members is associated with bank financial performance. The regressions that measure firm financial performance with Tobin's Q, ROA, or net interest margin are stated simultaneously as follows:

$$\begin{aligned} Perform = {} & \beta 0 + \Sigma \beta 1\ Wt\text{-}1 + \Sigma \beta 2\ TAt\text{-}1 + \Sigma \beta 3\ TDt\text{-}1 + \Sigma \beta 4\ NPLt\text{-}1 \\ & + \Sigma \beta 5\ TDt\text{-}1 + \Sigma \beta 6\ TLt\text{-}1 + \Sigma \beta 7\ DCD\ t\text{-}1 + \Sigma \beta 8\ BSt\text{-}1 \\ & + \Sigma \beta 9\ IBMt\text{-}1 + \Sigma \beta 10\ BMt\text{-}1 + \Sigma \beta 11\ CDt\text{-}1 \\ & + \Sigma \beta 12\ YDt\text{-}1 + \Sigma \beta 13\ BFEt\text{-}1 + \varepsilon \end{aligned} \qquad (1)$$

where,

Perform	Performance measured by Tobin's Q / ROA / Net Interest Margin
W t-1	Percentage of women on the board of directors
TA t-1	Ln (Total assets)
TD t-1	Percentage of total debt from total assets
NPL t-1	Percentage of non-performing loans from total loans
TD t-1	Percentage of total deposits from total assets

TL $_{t-1}$	Percentage of total loans from total deposits
DCD $_{t-1}$	A dummy variable of CEO duality (Y=1, N=0)
BS $_{t-1}$	Ln (Board size = number of directors)
IBM $_{t-1}$	Percentage of independent board members
BM $_{t-1}$	Ln (Number of board meetings per year)
CD $_{t-1}$	Country dummy
YD $_{t-1}$	Year dummy
BFE $_{t-1}$	Bank fixed effects
ε	Error term

When studying how the Basel III has impacted on banks with different level of board gender diversity, the hypothesis is tested by using a difference-in-difference estimation model. Difference-in-differences (DID) estimation model is one of the most popular models used in the applied research in economics. With this model, the impact of public interventions such as the prescription of new regulation, and other treatment of interest on outcome variables can be investigated. (Abadie 2005.) The regression that measures the difference-in-differences is stated as follows:

$$Perform = \beta 0 + \beta 1 DLawYear + \beta 2 DWomen + \beta 3 DInter + \varepsilon \qquad (2)$$

where,

Perform	Performance measured by Tobin's Q / ROA / Net Interest Margin
DLawYear	A dummy variable of Basel III (stipulated = 1, not yet stipulated = 0)
DWomen	A dummy variable of women representation (≥ 22.82 % women on the board = 1, < 22.82 % = 0)
DInter	A dummy variable of interaction between DLawYear and DWomen

A significant and positive coefficient estimate (β1>0) will confirm the research hypotheses. In case the coefficient estimate is statistically insignificant or negative, the research hypothesis is rejected.

4.3. Empirical findings

This section consists of the regression result of the investigation of the relationship between board gender diversity and bank financial performance. First, the descriptive statistics of variables is presented. After the descriptive statistics, the results from Pearson's correlation test, as well as from the univariate test of means, are presented. The section continues by stating the test results from the OLS regression analysis (equation 1). Finally, the test results from the difference-in-differences estimation analysis (equation 2) are presented.

Table 1 below reports the descriptive statistics of variables. The mean and median of Tobin's Q are near to one (1.001) and (0.990) which shows that the market value of bank reflects solely to the bank's recorded assets. The maximum value of 1.875 shows that these banks are expected to generate 87.5 % more value in the future and the minimum value of 0.867 shows that these banks are expected to benefit poorly available resources in the future. Among the largest listed European banks, the average ROA is 0.491 % and the median is 0.63 %. The mean of net interest margin is 2.279 % and the median is 1.94%.

On average, 22.799 % of the board members are women in the largest listed European banks. Banks with the highest female board members rate have only slightly over 50 % (53.850) women in their boards and still, there are banks without any female board members on their boards. These values show that even if the percentage of female board members has increased during the last years as can be seen from Figure 1, it is still at a relatively low level. The average natural logarithm of banks total assets is 19.224 and average total debt to total assets percentage is 28.994 %. The average non-performing loans ratio for the largest European banks is 9.443 % when the average deposit ratio is 47.032 % and the loans ratio is 168.929 %. 65.2 % of banks have a combined position for the position of bank CEO and the position of the Chair of the board. On average, the boards have 14.675 board members and 53.868 % of their board members are independent. However, in some banks, 100 % of board members are independent when in some banks, none of the board members are independent. The average amount of board

meetings per year is 14.366 but some banks have 68 meeting during one calendar year when some of the banks have arranged only 4 board meetings for one year.

Table 1. Descriptive statistics.

	Mean	*Median*	*Standard Deviation*	*Maximum*	*Minimum*
Tobin's Q	1.001	0.990	0.090	1.875	0.867
ROA	0.483	0.620	1.409	4.990	-12.420
Net Interest Margin	2.258	1.930	1.200	6.540	0.72
Women %	22.818	23.080	12.900	53.850	0.000
Size	19.201	19.158	1.382	21.534	16.409
Leverage	29.030	28.771	14.159	86.386	0
Non-Performing Loans	9.550	5.140	12.119	64.070	0.080
Deposits	47.195	45.945	16.889	81.800	3.100
Loans to Deposit	168.731	125.660	224.857	2823.270	66.170
CEO Duality	0.657	1.000	0.475	1.000	0.000
Board Size	14.602	14.000	4.890	30.000	2.000
Independent %	54.056	58.330	24.576	100.000	0.000
Board Meetings	14.484	12.000	7.555	68.000	4.000

Correlation between the variables is investigated by using the Pearson correlation test and the result of the test are reported in Table 2 below. As can be expected, the correlation between the Tobin's Q and ROA is statistically significant and positive (0.3061) but the uncorrelation between net interest margin and other performance variables is surprising. The correlation between board gender diversity and Tobin's Q is not statistically significant when the correlation between board gender diversity and ROA is statistically highly significant and positive. Instead, the correlation between board gender diversity and net interest margin is negative and significant.

Bank's size, as well as the leverage ratio which measures bank's debt level, non-performing loans ratio, loans to deposit ratio, CEO duality, and the percentage of independent board members are negatively correlated with Tobin's Q. Deposit ratio is the only ratio which has a positive correlation with Tobin's Q. ROA is also positively correlated with Deposit ratio, but negatively correlated with all other control variables.

However, net interest margin ratio correlates positively with the number of board members, CEO duality, deposits ratio, and non-performing loans ratio. The negative correlation exists between net interest margin ratio and leverage ratio, loans to deposit ratio, the percentage of independent board members, and the number of board meetings per year.

As can be seen from Table 2, board gender diversity is correlated with all control variables except with the number of board meetings. This points out the importance of the control variables in the regression analysis. The size of the company, leverage ratio, loans to deposit ratio, and the percentage of independent board members are positively correlated with the percentage of female board members. Instead, non-performing loans ratio, deposit ratio, CEO duality which shows if the position of company's CEO and the Chair of the board are combined, and the number of board members are negatively correlated with the percentage of the women on the board of directors.

Table 2. Correlation table.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	Tobin's Q	1												
(2)	ROA	0.3082***	1											
(3)	Net Interest Margin	0.0473	-0.0678	1										
(4)	Women %	0.0457	0.2528***	-0.2460***	1									
(5)	Size	-0.2639***	-0.0850	0.0492	0.2872***	1								
(6)	Leverage	-0.2541***	-0.2036***	-0.4412***	0.1595**	0.0562	1							
(7)	Non-Performing Loans	-0.1844**	-0.4224***	0.1075	-0.3297***	-0.3479***	-0.0271	1						
(8)	Deposits	0.2805***	0.1177	0.1773**	-0.2955***	-0.6809***	-0.6408***	0.3293***	1					
(9)	Loans to Deposit	-0.2097***	-0.0677	-0.2883***	0.2808***	-0.0716	0.7994***	-0.0040	-0.5115***	1				
(10)	CEO Duality	-0.3121***	-0.4198***	0.1841**	-0.2974***	0.1810**	-0.1115	0.2726***	-0.0922	-0.0776	1			
(11)	Boar Size	-0.0422	-0.2314***	0.1777**	-0.2968***	0.0372	0.0534	0.0570	-0.0238	-0.1550**	0.2916***	1		
(12)	Independent %	-0.2817***	-0.0758	-0.2794***	0.3626***	0.4824***	0.1940**	-0.1465*	-0.3936***	0.1395*	-0.1637**	-0.5188***	1	
(13)	Board Meetings	0.0485	-0.1824**	-0.2073***	-0.0393	-0.1963**	0.2730***	0.1506*	-0.0855	0.3237***	0.1070	-0.2455***	-0.0479	1

Pearson correlations.* significant at 10 %, ** significant at 5 %, *** significant at 1 %

Table 3 below reports the result of the univariate test of means. Based on the mean of the percentage of board gender diversity, the banks are divided into two categories: banks with zero or a few women on the board and banks with many women on the board. Banks with less than 22.82 % of female board members belong to the preceding group and banks with 22.82 % or more female board members belong to the latter group. As can be seen from Table 3, the results of the mean test are in line with the Pearson correlation test. The difference between the mean values of Tobin's Q is statistically insignificant when the difference between the means of ROA is statistically significant and positive. This means that on average, the banks with many women on their boards have a higher ROA ratio when compared to the banks with zero or only a few women on their boards. Furthermore, the banks with many female board members have lower net interest margin than banks with a few women on their boards which is also in line with the Pearson correlation test.

The mean of bank' size which is measured by the total assets of the bank and the mean of the percentage of independent board members are higher for the banks with many women in their board. Instead, leverage ratio, non-performing loans ratio, deposits ratio, loans to deposits ratio, CEO duality, number of board members, and the number of board meetings are smaller for the banks with many female members in their board than the banks with only a few women in the board.

Table 3. Comparison of banks with many females on the board to those with only a few.

Firm Characteristics	*Mean for banks with few women in the board*	*Mean for banks with many women in the board*	*Difference*
Tobin's Q	1.005	0.995	-0.010
ROA	0.329	0.681	0.352***
Net Interest Margin	2.499	1.881	-0.618***
Women %	15.162	32.100	16.938***
Size	18.703	19.797	1.094***
Leverage	30.123	27.723	-2.400***
Non-Performing Loans	11.786	6.829	-4.957***
Deposits	50.299	43.318	-6.981***
Loans to Deposit	190.790	141.920	-48.870***
CEO Duality	0.727	0.570	-0.157***
Board Size	14.911	14.228	-0.683***
Independent %	49.833	59.094	9.261***
Board Meetings	15.618	13.166	-2.452***

* significant at 10 %, ** significant at 5 %, *** significant at 1 %

Table 4 reports the OLS estimates of the relationship between board gender diversity and bank financial performance measured by Tobin's Q. The dependent variable, Tobin's Q, is a market-based measure for the bank's financial performance. Tobin's Q measures the investor's future expectations of the company's value and performance. It is defined as the sum of the market value of stock and the book value of debt divided by the book value of total assets. The independent variable, Women % (-1), is lagged value of the percentage of women on the board of directors.

As can be seen from Table 4, the association between the percentage of female board members and Tobin's Q is positive and statistically significant at 1 % level. In addition, the result in Table 4 shows the statistically significant correlation between most of the control variables and Tobin's Q. As assumed, the relationship between bank size measured by the natural logarithm of total assets, and Tobin's Q is negative and statistically significant at 5 % level. Bank's leverage ratio which is measured by total

debts divided by the total assets, also affects negatively to Tobin's Q as earlier assumed, but the estimate is not statistically significant. Furthermore, the correlation between non-performing loans ratio measured by the non-performing loans to total loans, and Tobin's Q is negative and statistically significant at 1 % level. Deposit ratio which is defined as total deposits divided by the total assets, as well as the loan ratio measured by total loans to total deposits, are both positively and statistically significantly associated with Tobin's Q.

Instead, the coefficient estimate for CEO Duality, which shows whether the position of CEO and The Chair of the board are combined or not, is negatively correlated with Tobin's Q. The result is statistically significant at 1 % level and it is in line with earlier researches (Fooladi 2011; Dury et al. 2016). As can be noticed from Table 4, this test does not find any significant correlation between board size measured as the natural logarithm of the number of board members and Tobin's Q. The percentage of independent board members is negatively and statistically significantly associated with Tobin's Q. Finally, the coefficient estimate for board meetings which is measured by the natural logarithm of the number of board meetings shows that the number of board meetings is not correlated with Tobin's Q. In addition, country dummies, year dummies, as well as the bank fixed effects are applied in the analysis to avoid the problem of endogeneity.

Table 4. Impact of board gender diversity measured by the percentage of female board members on European banks' financial performance measured by Tobin's Q.

Method: Panel Least Squares Region: Europe Dependent Variable: Tobin's Q		
Variable	Coefficient	t-Statistic
C	1.3553***	8.1794
Women % (-1)	0.0004***	2.8152
Ln Bank Size (-1)	-0.0135**	-1.9714
Leverage (-1)	-0.0001	-1.4770
Non-Performing Loans (-1)	-0.0018***	-5.2925
Deposits (-1)	0.0011***	3.9552
Loans (-1)	0.0001***	5.0654
CEO Duality (-1)	-0.0328***	-4.0110
Ln Board Size (-1)	0.0000	0.0017
Independent % (-1)	-0.0004***	-3.0282
Ln Board Meetings (-1)	0.0108	0.5763
Country Dummy		Yes
Year Dummy		Yes
Bank Fixed Effects		Yes
R-squared	0.3038	
Adjusted R-squared	0.2748	
F-statistic	10.4738	
Prob (F-statistic)	0.0000	
Number of observations	326	
Number of banks	72	

* significant at 10 %, ** significant at 5 %, *** significant at 1 %

Table 5 shows the OLS estimates of the relationship between board gender diversity and bank financial performance measured by ROA. The dependent variable, ROA is an accounting-based variable which is defined as net income (before extraordinary items) divided by the total value of assets. ROA measures the company's profitability in relation to its total assets.

Importantly, as can be seen from Table 5, the coefficient estimate for the percentage of women on the board of directors is positive and statistically significant at 1 % level. This

evidence suggests that the banks with more female members on their board of directors have approximately 1.02 % higher ROA value than banks with only a few women on their board. The estimated coefficients for the control variable are mostly in line with the estimates in Table 4 but the coefficient estimates are statistically significant only for some of the control variables.

The relationship between bank size and bank financial performance measured by ROA, as well as the relationship between leverage ratio and bank financial performance measured by ROA, are negative and statistically insignificant. However, the association between non-performing loans and ROA is statistically significant at 1 % level and negative. The coefficient estimate for the deposit ratio is positive but statistically insignificant. In line with results in Table 4, the correlation between loans ratio and ROA is positive and significant at 1 % level and the correlation between CEO Duality and ROA is negative and significant at 1 % level. The estimated coefficients for other variables, for board size, the percentage of independent board members, and the number of board meetings are statistically insignificant. These findings provide strong evidence of the positive association between the percentage of women on the board of directors and bank financial performance measured by return on assets.

Table 5. Impact of board gender diversity on European banks' financial performance measured by ROA.

Method: Panel Least Squares Region: Europe Dependent Variable: ROA		
Variable	Coefficient	t-Statistic
C	1.7346	0.7361
Women % (-1)	0.0102***	3.6744
Ln Bank Size (-1)	-0.0666	-0.7005
Leverage (-1)	-0.0060	-0.8480
Non-Performing Loans (-1)	-0.0277***	-3.1183
Deposits (-1)	0.0152	1.5748
Loans (-1)	0.0056***	4.5169
CEO Duality (-1)	-0.4126***	-7.2197
Ln Board Size (-1)	-0.0008	0.0060
Independent % (-1)	0.0008	0.2324
Ln Board Meetings (-1)	-0.0618	-0.8339
Country Dummy		Yes
Year Dummy		Yes
Bank Fixed Effects		Yes
R-squared		0.2463
Adjusted R-squared		0.2109
F-statistic		6.9631
Prob (F-statistic)		0.0000
Number of observations		291
Number of banks		72

* significant at 10 %, ** significant at 5 %, *** significant at 1 %

Table 6 reports the results from OLS regression which investigates the relationship between the percentage of female board members and bank financial performance measured by net interest margin. The dependent variable, net interest margin, measures a bank's success to invest its funds in relation to its expenses on the same investments. It is defined as investment returns minus interest expenses divided by average earning assets.

Interestingly, the estimated coefficient for the percentage of women on the board of directors is negative and statistically significant at 1 % level. The evidence suggests that

the higher percentage of female board members is associated with a decline in the value of net interest margin. On average, banks with the higher female representation percentage on the board of directors have 2.37 % lower net interest margin ratio. In line with the result in Table 5, the association between bank size and net interest margin is negative and statistically insignificant. Instead, leverage and non-performing loans ratios are statistically significant at 1 % level. The leverage ratio is negatively correlated with net interest margin when the correlation between the non-performing loans ratio and net interest margin is positive. The latter relationship is inverse when compares to the results in Tables 4 and 5.

The coefficient estimates for deposit ratio, loans ratio, and CEO Duality are statistically insignificant. Differing from the results in Tables 4 and 5, the relationship between the board size and bank financial performance measured by net interest margin is positive and significant at 1 % level. In line with the results in Table 5, the relationships between the percentage of independent board members and bank performance, as well as the number of the board meeting and bank performance, are statistically insignificant.

Table 6. Impact of board gender diversity on European banks' financial performance measured by Net Interest Margin.

Method: Panel Least Squares Region: Europe Dependent Variable: Net Interest Margin		
Variable	Coefficient	t-Statistic
C	8.3309	1.4443
Women % (-1)	-0.0237***	-6.1417
Ln Bank Size (-1)	-0.1683	-0.9689
Leverage (-1)	-0.0704***	-24.5156
Non-Performing Loans (-1)	0.0767***	4.9913
Deposits (-1)	-0.0399	-1.2863
Loans (-1)	0.0058	0.6590
CEO Duality (-1)	-0.1233	-0.9669
Ln Board Size (-1)	0.7152***	3.5641
Independent % (-1)	-0.0047	-1.2369
Ln Board Meetings (-1)	-0.0451	-0.2784
Country Dummy		Yes
Year Dummy		Yes
Bank Fixed Effects		Yes
R-squared		0.4065
Adjusted R-squared		0.3489
F-statistic		7.0596
Prob (F-statistic)		0.000
Number of observations		148
Number of banks		39

* significant at 10 %, ** significant at 5 %, *** significant at 1 %

All in all, the results in Tables 4, 5, and 6 provide strong evidence of the association between board gender diversity and bank financial performance. The evidence suggests the positive relationship between the board gender diversity and bank financial performance measured by Tobin's Q and ROA, and the inverse relationship between the board gender diversity and bank financial performance measured by net interest margin.

Next, the impact of Basel III on banks with different level of board gender diversity is examined. Table 7 reports the results of the difference-in-differences analysis. As can be

seen, when bank performance is measured by Tobin's Q, the estimated coefficient for Law Year dummy variable is negative and statistically significant at 5 % level. This result suggests that the value of Tobin's Q has decreased over the sample period. Interestingly, the coefficient estimate for Women dummy variable is negative and significant at 1 % level. This means that regardless of the prescription of new regulation, Basel III, banks with a higher percentage of female board members have a lower value of Tobin's Q when compared to the banks with a lower percentage of female board members. The coefficient estimate for interaction dummy is positive and significant at 5 % level. This result suggests that after the prescription of the Basel III, banks with a higher percentage of women on the board had 1.76 % higher value of Tobin's Q than the banks with a lower level of women on the board.

As can be seen, the estimated coefficients for the interaction dummy variable are statistically insignificant when the bank performance is measured by ROA or net interest margin. This result suggests that the impact of Basel III on ROA or net interest margin does not differ across the different types of banks: banks with many women on the board or banks with zero or a few women on the board.

Table 7. Impact of Basel III on banks with many women on the board and those banks with only a few.

Method: Panel Least Squares Region: Europe						
Dependent Variable	Tobin's Q		ROA		Net Interest Margin	
Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
C	1.0125***	579.9140	0.2755	1.3437	2.5099***	25.1285
Law Year	-0.0189**	-2.4392	0.1455	0.6748	-0.0270	-0.2687
Women	-0.0158***	-8.2922	0.4440**	2.2463	-0.4781**	-2.1376
Interaction	0.0176**	2.3419	-0.1777	0.2250	-0.2363	-1.0351
R-squared		0.0084		0.0186		0.0598
Adjusted R-squared		0.0031		0.0121		0.0477
F-statistic		1.5891		2.8841		4.9589
Prob(F-statistic)		0.1901		0.0354		0.0023
Number of observations		575		575		575
Number of banks		86		86		86

* significant at 10 %, ** significant at 5 %, *** significant at 1 %

5. CONCLUSIONS

Numerous previous researches and the theory of corporate governance support the argument that there is a link between the board structure and firm performance. One of the dimensions of board structure is the demographic diversity on the board, which may have an impact on the firm performance. However, the results from previous studies that have focused on the relationship between board gender diversity and firm performance (listed in Appendix 2.) are mixed. The purpose of this study is to provide empirical evidence on the correlation between board gender diversity and bank financial performance in large European banks. In addition, the impact of Basel III which stipulated in 2014, on the banks with different level of board gender diversity is investigated.

Focusing on the largest European banks with total assets 25 million euros or more in 2011 and controlling country, firm, and board level variables, the result of this study indicates the positive correlation between the percentage of women on the board and firm financial performance measured by ROA and Tobin's Q. The banks with more women on their board have approximately 1.02 % higher ROA ratios and 0.04 % higher Tobin's Q ratios than banks with fewer women on their boards. However, the results are inverse when the financial performance is measured by net interest margin. The Banks with higher female board members percentage have 2.37 % lower net interest margin ratios compared to the banks with lower female board members percentage. These results provide strong evidence that large European banks with a higher percentage of female board members are more profitable measured by ROA. Also, these banks are expected to perform better also in the future than banks with a lower percentage of female board members when the future's expectations are measured by Tobin's Q.

In addition, studying how the Basel III has affected bank financial performance in different types of banks regarding women portion on their boards, I find that after the prescription of Basel III, banks with a higher proportion of women on their board have 1.76 % higher Tobin's Q. This study does not find similar statistically significant correlation between the Basel III and banks with more women on their board when the bank performance is measured by ROA and net interest margin. These results suggest that

the impact of Basel III on bank market value measured by Tobin's Q is positive for the banks with more female board members. However, the impact of Basel III on bank's profitability measured by ROA and net interest margin does not differs across different types of banks: those with many women on their board and those with zero or only a few.

The hypotheses tested in this study are developed based on the previous studies and theories that are earlier presented. The result of this analysis reported in Table 4, 5 and 6 reject the first null hypothesis and confirm the test hypotheses. However, the result in Table 7 rejects the null hypothesis only partly. The first test hypothesis can be confirmed based on the empirical evidence in Table 7, but the empirical evidence is not enough to reject the null hypothesis or confirm the other two (2. and 3.) test hypotheses.

This study focuses on only the large banks in European countries and thus the results cannot be generalized. In the other continents, or in the other industries or among the smaller companies, the results may be different due to different operating environments and different principles of corporate governance.

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Appendix 1. Banks.

Country	Bank
Austria	ERSTE GROUP BANK AG RAIFFEISEN BANK
Belgium	KBC GROUP NV DEXIA SA
Cyprus	BANK OF CYPRUS
Czech Republic	KOMERCNI BANKA, A.S.
Denmark	DANSKE BANK A/S JYSKE BANK A/S
Finland	NORDEA BANK ABP POHJOLA BANK
France	CREDIT AGRICOLE SA STE. GENL. DE FRANCE NATIXIS BNP PARIBAS SA
Germany	DEUTSCHE BANK AG COMMERZBANK AG DEUTSCHE POSTBANK AG
Greece	ALPHA BANK SA NATL BANK OF GREECE EUROBANK ERGASIAS SA PIRAEUS BANK BANK OF GREECE SA
Hungary	OTP BANK NYRT
Ireland	BANK OF IRELAND PERMANENT TSB GROUP
Italy	INTESA SANPAOLO UNICREDIT SPA MEDIOBANCA SPA BANCO BPM SPA UNIONE DI BANCHE BANCA MONTE PASCHI BPER BANCA SPA BANCA CARIGE BANCA POPOLARE

Italy	BANCA PICCOLO CREDITO EMILIANO SPA
Netherlands	ING GROEP N.V.
Norway	DNB ASA
Poland	POWSZECHNA KASA BANK PEKAO S.A. SANTANDER BANK
Portugal	BANCO COMERCIAL PORT BANCO BPI, S.A. BANCO ESPIRITO SANTO
Spain	BANCO SANTANDER SA BANCO BILBAO VIZCAYA CAIXABANK BANKIA BANCO SABADELL BANKINTER S.A. BANCO POPULAR ESP. BANCO ESPANOL DE CREDITO
Sweden	SWEDBANK AB SKANDINAVISKA ENSKILDA BANKEN SV. HANDELSBANKEN AB
Switzerland	UBS GROUP AG CREDIT SUISSE GROUP JULIUS BAER BANQUE CANT VAUDOISE
UK	HSBC HOLDINGS PLC LLOYDS BANKING GROUP BARCLAYS PLC ROYAL BANK STANDARD CHARTERED TSB BANKING

Appendix 2. Table of previous studies.

Year	*Research*	*P. measure*	*Effect*
2003	Carter, Simkins and Simpson (2003) 1997 Fortune 1000	Tobin's Q	Positive
2008	Campbell and Minguez-Vera 1995-2000 Madrid stock exchange	Tobin's Q	Positive
2008	Francoeur, Labelle and Sinclair-Desgagne 2001-2004 FP500	Abnormal stock returns	Insignificant
2009	Adams and Ferreira 1996-2003 US Firms	Tobin's Q and ROA	Negative
2010	Carter, D'Souza, Simkins and Simpson 1998-2002 SP 500	Tobin's Q and ROA	Insignificant
2012	Ahern and Dittmar 2001-2009 Oslo stock exchange	Tobin's Q	Negative
2015	Marinova, Plantenga and Remery 2007 Netherland & Denmark	Tobin's Q	Insignificant
2015	Terjesen, Couto and Francisco 2010 47 different countries	Tobin's Q and ROA	Positive
2015	García-Meca, García-Sánchez and Martínez-Ferrero 2004-2010 9 different countries	Tobin's Q and ROA	Positive
2016	Perryman, Fernando and Tripathy 1992-2012 2566 firms*	Tobin's Q	Positive
2017	Reguera-Alvarado, de Fuentes and Laffarga 2005-2009 Spanish stock exchange	Tobin's Q	Positive
2017	Gordini and Rancati 2011-2014 Italian stock exchange	Tobin's Q	Positive
1997	Shrader, Blackburn and Iles 1992 Fortune 500	ROA and ROE	Negative
2003	Erhardt, Werbel and Shrader 1993-1998 US Firms	ROA and ROI	Positive
2015	Isidro and Sobral 2010-2012 European 500 largest firms	ROA and ROS	Positive
		Tobin's Q	Insignificant
2015	Low, Roberts and Whiting 2012-2013 Asian firms	ROA	Positive
2018	Owen and Temesvary 1999-2015 U.S. Firms	ROA + 3 other	U-Shaped

* data from Compustat and ExecuComp