The Effect of Gender and Age Diversity's on Firm Performance: A Study of West European Banks

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Abstract Currently, the business world is marked by numerous inequalities, including those related to gender. Women are undervalued and underrepresented, although the existing literature cannot provide hard evidence that they underperform. The aim of this paper is to tackle this problem by investigating how firm performance is affected by women. The relationship between the share of women and the average age on a board and firm performance, and to what extent the relationship between the share of women and company performance is related to their age will be examined. The panel data of 35 banks located in the Netherlands, Germany or Belgium over the period from 2014 to 2023 is used. Using a pooled OLS regression and fixed effects models, an insignificant relationship was found between the average board age and the firm performance of banks. However, a positive and significant effect was found of the share of female board members on firm performance, which strengthens when the average age of the women is higher. Ultimately, it appears unwise for companies to undervalue women.

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Chapter 1 Introduction and Relevance

1.1 Introduction

In today's modern society, the pursuit of equality and diversity is a hot topic. Numerous articles, including Reddy and Jadhav (2019), have written about how women are underrepresented and undervalued in business, especially when it comes to positions in the upper management of companies. The numbers from IFC, International Finance Corporation, of the year 2023 show that globally only 23.3 percent of board seats, 8.4 percent of board chair, 6 percent of CEO, and 17.6 percent of CFO positions are held by females. Firms and organizations are encouraged to create a working environment where men and women are valued equally. Some countries have introduced gender quotas to reduce the inequality between men and women in the business world. The gender quota laws aim to address the ethical concern of women underrepresentation, despite the equal competence (Terjesen et al.,2015).

The effectiveness of the quota has been studied in several countries, including the Netherlands (Jongen et al., 2019) and Norway (Yang et al., 2019). The findings of Jongen et al. (2019) suggest that the share of women in top management positions is increasing slightly faster in countries with corporate governance targets compared to those without. However, this increase is significantly smaller than what is seen with the introduction of quotas. Additionally, it is uncertain if the targets are the direct cause of this growth. Yang et al. (2019) tested the causal effects of the Norwegian gender-balancing quota. Their results show a high effectiveness of the quota on the share of women directors on the boards of firms. The gender quota was introduced in Norway in 2003. A strong increase in the gender diversity ratio of the board, indicated by the share of females, is shown from the year 2004.

Moreover, Yang et al. (2019) suggest a negative correlation of firm performance, and the firms' risk with the proportion women on the board of directors by the quota. Several other studies argue that gender diversity improves the overall performance of companies. Increasing the female representation on the board is necessary to positively influence the economic results of a firm. Gender diversity brings new and different ideas, skills, and views to the board. The board's diversity also boosts the equality between men and women which brings a firm advance on ethical and social ground (Reguera-Alvarado et al, 2017). Additionally, many recent articles in the literature show a significant and positive correlation between gender diversity of the board and firm performance (Brahma et al., 2021; Kılıç and Kuzey, 2016; Marinova et al., 2016; Moreno-Gómez et al., 2018; Reguera-Alvarado et al, 2017). However, it has not been studied yet whether the effect of the gender diversity of the management board of a firm is affected by the different characteristics of the females in question. This study is interested in the role of the average age of the female board members in the effect of the gender diversity ratio on firm performance. Furthermore, it also examines whether the positive

relationship between the share of women on the board of directors and corporate performance holds in the context of banks The research questions are as follows:

1. *What is the relationship between the share of female board members and firm performance?*
2. *What is the relationship between the average age of board members and firm performance?*
3. *To what extent is the relationship between the share of women on a board and firm performance different when the average age of the women is higher?*

The literature contains articles studying the effects of other management board characteristics on firm performance. Such as board independence, CEO duality, (Pucheta-Martínez and Gallego-Álvarez, 2020), board meeting, directors accounting expertise (Johl, et al. ,2015), ethnic diversity and age diversity (Abdullah and Ku Ismail, 2017). The average age of board members was also of interest to a few researchers. Bonn et al. (2004), for example, studied the average age of the board of directors and firm performance. They found a significant and negative relationship between the average age and firm performance in their sample. Although, Platt and Platt (2012) argue that the chance of bankruptcy declines in the age of the corporate board.

Other studies investigate the effects of the age of the CEO of firms. The age of CEOs is significantly and positively correlated with the organic growth (Barba Naveretti et al., 2022) performance (Cheng et al., 2010), the level of corporate performance (Fabrizi et al., 2014; Lee et al., 2018; McCarthy et al., 2017), and the chance of bankruptcy (Platt and Platt, 2012) of firms. The intellectual capabilities of CEO, such as knowledge and experience, improve by their age (Parker, 2009; Sitthipongpanich and Polsiri, 2015).

The findings from the many articles suggest there seems to be a connection between gender diversity or the average age of the board and firm performance. Nevertheless, it has not previously been studied whether the average age of female members has a significant impact on the relationship between gender diversity and firm performance. In this paper the relationship between the share of women and the average age on a board and firm performance are studied, and to what extent the relationship between the share of women and company performance is related to their age.

In the next part, section 1.2, the social and scientific relevance of the research will be explained. Chapter 2 includes the theoretical framework, in which the answers to the research questions are substantiated with existing literature. The institutional context will also be briefly discussed here. The next part, chapter 3, contains all the information regarding the data used in this paper. In chapter 4 the methods used will be explained. Followed by chapter 5 where the results of the study are discussed. Ultimately, chapter 6 includes the discussion and conclusion.

1.2 Relevance

1.2.1 Social Relevance

This paper investigates the relationship between the share of women and the average age on a board and company performance, and to what extent the relationship between the share of women and company performance is related to their age. Studying the relationship between the gender diversity of the board and the firm performance is socially relevant for several reasons. Firstly, researching gender diversity helps identify the inequalities in the boardroom further and can lead to measures that promote more equal representation. Although there is currently a lot of policy attention on this issue, there remains limited understanding of the consequences of these encouraging policy measures. Understanding the relationship contributes to a more inclusive and effective business community, which can eventually lead to better economic and social outcomes. The results of this study will suggest whether increasing the female share on the board correlates with the firm performance of banks. Based on the results of this paper banks get a better indication of the relationship and can make decisions that improve their process.

The second relationship examined in this paper is between the average age of all board members and firm performance. The first reason why studying this relationship is socially relevant, is because it also helps identify the inequalities in the boardroom and can lead to measures that promote more equal representation. Furthermore, the results of this paper will argue whether a higher average age leads to better firm performance. Older members could be more experienced and have more expertise. However, younger board members can bring new ideas and technologies to the board. Furthermore, an older board can contribute to the image of stability to the clients. On the other side it can also show that the firm is not able to adapt to modern. Only a few articles wrote about the relationship between the average age of the board and firm performance, which means that the companies may have little understanding of this. Investigating this relationship will increase companies' insights, allowing them to make better decisions regarding the age of board members for performance purposes.

Lastly, it is studied how the average age influences the relationship between the proportion of women on the board of directors and the firm performance of banks. Previous studies have already shown that the gender diversity of the board can potentially lead to better decision-making, innovation and firm performance. The results of this paper allow firms to better optimize their board composition, due to the new insights into how the different dimensions of gender and age diversity interact and influence each other. It gives an indication whether a board with older or younger female members perform differently. Due to the new information, firms can make more thoughtful and effective choices regarding the selection of new board members. Furthermore, it contributes to discussions about the importance of inclusivity and equality within business. The results can help policymakers develop more effective strategies for promoting gender equality in business. Moreover,

policymakers can design programs that support women throughout their careers, from young professionals to experienced leaders.

1.2.2 Scientific Relevance

The research first contributes to the literature about gender diversity and firm performance. This relationship is a highly interesting topic in modern society. However, it has not been previously studied with the sample used in this paper. A few articles studied the effect of gender diversity on bank performance using a big sample gathered from many different countries or just one country. The results of this paper will increase the knowledge of West European banks regarding this topic. Furthermore, the existing articles suggest various kinds of relationships. Some suggest a relationship that is positive and significant, negative and significant, and others a non-significant relationship. The results of this paper will help clarify the effect of gender diversity on firm performance, especially in the banking industry.

Besides, studying how the average age of all board members relates to firm performance is also of scientific importance. The literature regarding this subject is scarce, since the association between those two has been studied in only a few articles. However, multiple articles argue the different and significant effects of the CEO age. Based on these articles, it can be suggested that such effects also arise among other management members of lower levels, in this case the board of directors. This paper will clarify whether the effects of average age of the board members appear too. In addition, the added information in this area can improve the regulations implemented by policymakers and companies. This paper focusses on a selected number of banks located in the western part of Europa. Consequently, the results of this study will apply to a limited group of firms. Due to the limited time and data availability the sample is relatively small. In an ideal world, this study's findings apply to many more firms in many more countries, but unfortunately that is not possible. Hopefully this paper is the basis for many more studies concerning this subject. Therefore, it is important to expand the literature on the average age of board members.

Lastly, studying the relationship between the proportion of women on the board of directors and the firm performance of banks is influenced by the average age fills a gap in the existing literature. It adds new knowledge in the effects of gender diversity and the average management age. The impact of women's age on the influence that women have on boards has never been examined. Therefore, it introduces a new perspective on this subject. The results add on to the information about how companies can put together an even better management board. The outcomes of the research can help firms with creating more effective governance structures and diversity policy. Eventually, this may improve the sustainability, overall performance, and gender diversity of the management board of businesses. Overall, this paper builds on something important to the current literature

Chapter 2 Theoretical Framework

2.1 Gender Diversity

The current literature contains extensive research about the effect of gender diversity in the boardroom on firm performance. Many industries and countries are used as samples for researching this topic. In the discussed articles the gender diversity ratio is used as an indicator for proportion of female members on the board. According to many articles, diversity is purported to significantly positively correspond to a firm's performance. For example, evidence has been found for a positive and significant correlation between the gender diversity and the Tobin's Q, ROA (Brahma et al., 2021), risk-taking (Bhat et al., 2020), governance (García-Meca et al., 2015), board monitoring intensity (Ararat et al., 2015), profitability (Ferreira, 2010) of companies.

Some articles only argue a potential relationship or an even more significant positive one when the share of female board members reach a certain threshold. For example, Gyapong et al. (2016) studied this association using the data of 245 South African listed firms over the period from 2008 to 2013. The findings argue that a firms' value is suggested to be even more affected when there are at least three females present on the board. In addition, De Masi et al. (2021) studied the relationship between women on the board and board monitoring tasks based on group categories identified in the Kanter's theory. This management theory suggests how a company operates affects the attitudes of the personnel. In their study they used a sample of the largest listed companies in Spain, Italy and France over the period from 2007 to 2017. The sample was divided based on different board characteristics, regarding the percentage of female board members. The outcomes of the article propose that only if the gender diversity ratio reaches a value of at least 33% the correlation of women on board monitoring tasks is positive and statistically significant (De Masi et al., 2021).

Furthermore, some papers highlight the different qualities and experiences women have in contrast with men, which may positively influence the performance of the firm. Women bring new and different perspectives, experiences, and networks to the boardroom, which is positively related to firm performance (Fernández-Temprano et al., 2020). Women possess certain leadership qualities better than men, such as cooperation, collaboration, and interpersonal sensitivity (Ely and Rhode, 2010). In addition, Eagly, and Johannesen-Schmidt (2001) studied the differences in leadership style between men and women. Men tend to have better the agentic characteristics, such as aggressive, ambitious, dominant, forceful, independent, daring, self-confident, and competitive. The communal characteristics are ascribed more strongly to women, such as affectionate, helpful, kind, sympathetic, interpersonally sensitive, nurturant, and gentle.

However, some articles do mention the potential negative effects of the boards' gender diversity. Böhren and Ström (2005) examined firms listed on the Oslo Stock Exchange over the period 1989 to 2002. The results propose that an increase in the share of women on the board has a negative

effect on Tobin's Q. This is in line with the argument that higher heterogeneity on the board leads to less effective decision-making. Furthermore, women are less likely to challenge their male counterparts when they are a minority in the boardroom. Therefore, the correlation between a small percentage of female board members and board performance is insignificant (Kakabadse et al., 2015). Moreover, gender diversity may reduce group cohesion, increase member dissatisfaction, and eventually increase a firm's turnover (Broome et al., 2010). Lastly, Adams and Ferreira (2009) found a potentially significant negative effect of board diversity on overall firm performance in their sample. However, they do mention that women have fewer attendance problems, which indicates they are more likely to be present at monitoring committees.

This paper uses the data of banks located in the countries Germany, the Netherlands and Belgium is gathered. Therefore, to obtain an expectation regarding the first hypothesis, the findings of studies using banks as sample too are examined explicitly. A considerably larger share of articles in the literature provide evidence for the possible significant and positive relationship between gender diversity in the management board and various measures of banks' business performance. Garcia-Meca et al. (2015) support the potential relationship between gender diversity and bank performance with their findings. They examined the data of 159 banks located in nine different countries over the period from 2004 to 2010. The outcome of the study showed a significant and positive correlation between the share of female board members and the bank performance, indicated by the Tobin's Q and ROA, in the sample. In addition, Owen and Temesvary (2018) used the data of 90 US bank holding companies over a period from 1999 to 2015 period. Their results showed that the relationship between gender diversity on the board and bank performance is non-linear, indicating a certain threshold. Their findings propose that the share of female board members has a positive effect on the performance once a certain threshold level is reached. Several other studies showed that gender diversity positively corresponds to bank performance in their sample, including Galletta et al. (2022), Jabari et al (2021), Endraswati (2018), Mateos de Cabo et al. (2012), and Mohammed et al. (2018). After reviewing the current literature, the first hypothesis is:

H1: There is a significant positive relationship between the proportion of women on the management board and the firm performance of banks.

2.2 Average Age

Research on the relationship between the average age of the management board and firm performance is far less common in literature. One of the articles which did study the effects of the average age on the boardroom is Jonson et al. (2020). The research used a sample of 130 Firms located in Australia from the ASX 500 All Ordinaries over the period from 2011 to 2015. They suggest a positive correlation between the average age of the board and the quality of the boardroom. The age of

members is associated with their experiences and has a positive influence on company performance, as measured by ROA. In addition, the results by Arnaboldi et al. (2020) suggest a positive association between older than average boards and bank profitability, measured by stock returns and standard deviation, in their sample of Chinese banks during the Eurozone crisis.

Generally, the average age of management board members varies between 50 and 65. Several studies show similar values of the average age of directors, for example the mean values in some articles are 54.2 (Adams, 2010), 54.6 (Daggson and Larsson, 2011), 55.7 (Chang et al., 2017), 57.3 (Khaireddeni et al., 2020), 57.7 (Arnaboldi et al.,2020) 59.9 (Horváth and Spirollari, 2012) and 60.3 years (Anderson et al., 2004). Therefore, the age of board members is quite comparable between various firms. Board members tend to be relatively old in most cases, consequently when the average age is lower it is assumed that the age diversity is higher. Since articles about the effect of average age of the board are scarce, articles that mentioning the effects of age diversity are reviewed.

Moreover, Xu et al. (2014) argue that the average age of the board reflects the directors' monitoring incentives and experiences. Older directors could bring more valuable experiences, accumulated in the industry, to the board (Jhunjhunwala and Mishra ,2012). On the contrary, younger members in the boardroom are more likely to take risks and implement structural changes to improve the firm's prospects (Horváth and Spirollari, 2012). Moreover, the study by Jhunjhunwala and Mishra (2012) argues that younger members are protential more familiar with innovative technologies.

Talavera et al. (2018) studied the effect of age diversity on bank performance in China, using the sample of 97 Chinese banks over a time spam from 2009 to 2013. The results suggest that the age diversity of boards is negatively correlated with the profitability of a bank. They support it with the argument that the heterogeneity among the directors' views on prudence, risk and wealth is likely to start internal conflicts in the decision-making process. The board may not function effectively and therefore can cause a decrease in bank profitability. In addition, Arnaboldi et al., (2020) claim a negative relationship between board's age diversity and overall bank performance, indicated by multiple measures. They used a sample of publicly listed commercial banks from EU countries from 2007 to 2015.

In contrast, Fernandes et al. (2017) believed diversity, including age, leads to better decisions and performance due to the different points of view and perspectives brought to the board. The study used the data of 72 listed European banks during a financial crisis. The results showed a positive and significant association between age diversity and bank performance during a financial crisis. Additionally, age diversity on the board is potentially positive related to the shareholders value (Hagendorff and Keasey, 2012), corporate governance, human resources, human rights, and environmental activities (Beji et al., 2020) of banks.

In other industries, the effects of age diversity are also investigated. Kanakriyah (2021) found an insignificant association between age diversity and performance in the sample of industrial and service companies and Song et al. (2020) in the lodging industry. The results from the article by Li et al. (2020) however suggest that the organizational performance is positively correlated to the age diversity of the board via human and social capital. They used survey data from Society for Human Resource Management, regarding manager-report workplace. Moreover, Dagsson and Larsson (2011) argue the potential positive effect of age diversity on firm performance, measured by a firm's ROA, using a sample of companies listed on the OMX Stockholm exchange. However, the results also suggest that the effect only accounts for firms with a market capital below 150 million euros. Lastly, Hafsi and Turgut (2013) mention the negative correlation between age diversity and social firm performance. They examined a random sample of 100 companies listed in the S&P500 Index. The results propose that when the age diversity of the board increases, the social performance of a firm lowers. Substantiated with the argument, the decision-making process may be slowed due to a generation conflict within the board.

The various articles mentioned show inconsistent results of the potential relationship between the average age or age diversity of the board and firm performance. In this paper, this association is studied, using a sample of 35 banks in western Europe. The second hypothesis is:

H2: There is a significant positive relationship between the average age of the management board and firm performance of banks

2.3 Gender Diversity and Average Age

It has not previously been studied whether the relationship between gender diversity and company performance is influenced by their average age. Nevertheless, Haist et al. (2000) studied the interaction effect in question on academic performance and on academic difficulty. They used a sample of all students of 3 medical school classes at one institution. The results showed a significant interaction between gender and age in the prediction of both academic performance and academic difficulty. They suggest that an older women performed better in 3 classes at one medical school than younger women and older man. Furthermore, the outcome of the research by Steffensmeier et al. (1998) showed that the correlation between gender and a person's sentencing is significantly stronger for men than for females, which suggest a significant interaction effect between gender and age. Analyzing both articles leads to assumption of a potential interaction effect between age and gender.

Another interesting study to mention is by Buse et al. (2014). They studied interaction effect between racial/ethnic diversity and gender diversity on internal and external governance practices. The findings suggest that when the gender diversity on the board increases, the negative correlation of racial/ethnic diversity and external board practices weakens. The results even show a potential positive

correlation of racial/ethnic diversity and external governance practices when the gender diversity of the board is of considerable size. These findings suggest that characteristics of the management board may interact with each other. Unfortunately, no other relevant articles are found to support this claim.

Gender diversity is expected to have a positive and significant effect on firm performance (Brahma et al., 2021; Bhat et al., 2020; García-Meca et al., 2015; Ararat et al., 2015; Ferreira, 2010). Therefore, the first hypothesis stated a significant positive relationship between the proportion of women on the management board and the firm performance of banks. In addition, older individuals bring more valued experiences and skills to the management board of firm, which positively influences firm performance (Jonson et al., 2020; Xu et al., 2014; Jhunjhunwala and Mishra ,2012; Horváth and Spirollari, 2012). As a result, the second hypothesis expects a significant positive relationship between the average age of the management board and firm performance of banks. Conducting the reviewed literature and the hypotheses leads to the third and last hypothesis of this paper:

H3: The relationship between the proportion women on the management board and firm performance of banks is larger when the average age of female board members is higher.

2.4 Contributions to the Literature

 First, this article contributes to the existing literature regarding gender diversity in the business world. Many articles wrote about the possible relationship between gender diversity on the board and firm performance, including in the banking industry. However, the findings in this area are inconsistent. Therefore, investigating this relationship can help to clarify the relationship in question. Furthermore, this study also examines the relationship between the average age of board members and corporate performance. To date, only a verry few articles have examined this relationship. Consequently, this research contributes to literature that argues the effects of the average age of directors. Finally, it looks at how the effect of gender diversity of the board of directors on firm performance is influenced by the average age of the female members. This has not been investigated before, so it certainly contributes to literature. It enriches the knowledge concerning the understanding of interaction effects within boards.

Chapter 3 Data

3.1 Data and Sample Collection

This research uses panel data from banks located in the countries Germany, the Netherlands and Belgium over a period from 2014 to 2023. Banks are obliged to regularly disclose financial information to their supervisors. This ensures that economic information from these business types is easier to find and more complete, unlike other sectors, which explains the choice of the entity type. However, the data regarding the characteristics, including age, of board members is harder to gather. Collecting the needed and complete information for only 1 country leads to an unusable small dataset. Therefore, the data of banks established in three different countries is used to significantly increase the sample size. In addition to the fact that the three countries Germany, the Netherlands and Belgium border each other, which ensures the necessary similarities, they are also all members of the European Union. Meaning they all follow EU regulations and fall under the supervision of the European Central Bank (ECB). The obtained data is likely to be comparable, which simplifies the analysis.

The research requires data of the selected banks regarding the variables, ROAA, leverage ratio, total assets, gender diversity, age of board members and board size. The panel data from the years 2014 to 2023 is mainly gathered from the Orbis Bank Focus database and the annual reports of the banks. Orbis Bank Focus is a database provided by Bureau van Dijk, a global provider of business information. It contains information on countless financial institutions worldwide. The value firm size and performance are derived from the database Orbis. Furthermore, the detailed information about the composition of a firm's board of directors is hand-collected and mostly obtained from the annual reports of the banks concerned. The database Orbis provides some information regarding the board of directors but is incomplete and unusable in most cases. The information about the members of the board of directors was taken from the banks' annual reports and, if necessary, supplemented with the help of other websites, such as LinkedIn and Marketscreener. In total, data was collected from 35 banks over a period of 10 years with 16 banks located in Germany, 12 banks in the Netherlands and 7 banks in Belgium, resulting in 350 firm-year observations. The banks are selected based on whether the needed information is available and complete. Collecting the data takes a lot of time and not all banks release the necessary information for this research. As a result, the sample size is on the small side.

3.2 Institutional Context in Sample Countries

This study uses a sample of banks located in the Netherlands, Germany or Belgium. Since all three countries are members of the European Union (EU), they face similar regulations. All banks established in the EU are subject to the supervision and legislation of the European Central Bank

(ECB). In this section the programs introduced by the ECB regarding gender targets will be briefly explained.

The first program they introduced in 2012 aimed to double the share of women in manager positions over the period from 2013 to 2019. The target of female senior managers was 28% at the end of 2019 and the final percentage exceeded this by 2 percentage points, namely 30%. However, the target of 35% women in all management positions was not achieved in 2019. There was an increase from 17% in 2013 to 30% in 2019.

In 2020, the ECB announced a new program to improve the gender balance of employees at all levels. The new target is to fill at least half of the open and new positions with females on all levels. Furthermore, the program aims to increase the female share to a percentage between 40% and 51% at the end of 2026. The ECB will oblige banks to meet with their strategies regarding diversity and banks that do not check the rules will face sanctions

3.3 Gender Quota in Sample Countries

In the Netherlands there has been a women's quota since 2022. The data provided by the database SER shows the average percentage of women on the management board in the Netherlands from the year 2012. SER is a database that publishes the data of large companies report on the male-female ratio in their top and sub-top levels for every year. In the timespan from 2012 to 2022 gender diversity ratio shows a slightly upward trend from 7.4% to 14.7%. However, since the country implanted the gender quota in 2022, the ratio of management board members who were appointed in 2022 consisted for 27% women, indicating change is on the way.

In Germany the woman quote existed since the year 2016. The law requires one hundred major companies on the German DAX index to appoint at least 30% women to top positions. Statista, a German online platform that collects and publishes statistical data, shows the information regarding the gender diversity of the management board of the top 100 firms of the country of the years 2006 till 2023. The data shows a slightly upward trend from 0.2% in 2006 to 5.3% in 2015. After this period the quota was implemented, and the upward trend becomes a little steeper. At the end of 2023 the share of women in the management board has a value of 19.4%, indicating an increase of 14.1% since the year 2015. Suggesting that the implementation of the new law in Germany has promoted gender diversity within companies.

Lastly, Belgium introduced a law in 2011 based on which women have a guaranteed minimum representation on the board of directors. Furthermore, in 2017 the mandatory minimum quota of 33% female board members, will come into effect for all listed companies in Belgium. OECD, Organization for Economic Co-operation and Development, provide the data of the share of women on the board of

the largest publicly companies in Belgium for the years 2010 to 2022. The data shows a total increase of 28.8% over a time span of twelve years. In 2010 the share of female board members was 10.5% and in 2022 39.3%. The trend shows a strong and almost linear increase without sudden outliers. Just like for the other two countries, it suggests that the gender quote influences the gender diversity on the board.

3.4 Variables

3.4.1 Dependent Variable

In this study, a company's ROAA, Return on Average Assets, is used as a measure of firm performance. The ROAA is a globally recognized benchmark that makes it possible to compare the performance of different banks. Furthermore, banks' primary activities are to manage and utilize assets, making ROAA specifically relevant to this sector. In addition, ROAA normalizes profitability relative to assets, making it easy to compare banks of different sizes. The metric ROAA indicates a firm's profitability in relation to its total average assets during a period, generally a financial year. ROAA is calculated by dividing net profit by average total assets and the ROA, Return on Assets, by the total assets at the end of the period. Generally, the ROAA is a more accurate measure of a company's profitability. This is especially accurate in situations where there is significant variation in the value of a firm's assets during the period. The ROAA is therefore used as an indicator of firm performance and derived from the database Orbis Bank Focus.

3.4.2 Independent Variables

The independent variables are mainly collected using annual reports. The first independent variable is defined by the share of female board members of a firm. Subsequently, a dummy variable was created based on this variable, taking a value of 1 if companies have a gender diversity ratio of 0.25 or higher, in case it is lower it takes a value of 0. The variable is conducted to test the suggestion of previous articles that there is certain threshold in the relationship between the board's gender diversity and firm performance (Gyapong et al., 2016; De Masi et al., 2021). The next independent variable reflects the average age of the (entire) board. According to findings of several articles age is associated with the experiences and capacities of individuals, under which Mahlo and Windsor (2021). Personal information is extracted from the banks' annual reports and, if necessary, supplemented by other sites. The fourth independent variable is like the previous one, but only concerns the age of the female board members. Finally, there is an independent categorical variable for the different countries. The variable takes a value of 0 for the banks established in the Netherlands, 1 for the German banks and 2 for the Belgian banks.

3.4.3 Control Variables

To increase the validity and interpretation of the results, control variables are added to the regressions. The choice of variable is supported by findings from current literature. The first added control variable indicates the firm size, defined by the total assets of a company (Carter et al., 2010). Evidence in the current literature shows a positive relationship between the firm size and the ROA (Doğan, 2013). The value of the total assets was divided by 1 billion for the analysis in this research. The database Orbis is used for deriving this information. The second control variable included in the regression is a firm's leverage, specified by the ratio of firm debt to total assets (lyukhin, 2015). The current literature shows evidence for both a negative (Iqbal& Usman, 2018) and a positive (Ibhagui& Olokoyo, 2018) relationship between the leverage and the ROA of a firm. However, most of the cases show a significant relationship, which indicates the relevance of adding the variable into the regressions. The leverage ratio data is derived from the annual or disclosure reports of the firms. The last added continuous control variable is the size of the board of directors, measured by the number of members on the board of directors. Previous studies already provide evidence for the relationship between board size and business performance. Some articles suggest a significant and positive relationship (Alabdullah et. al, 2018) while other a significant and negative relationship (Guest, 2009).

3.5 Descriptive Statistics

Table 1.1 includes the descriptive statistics of the entire data set. The mean values show a couple of things. Firstly, that the selected banks have an average share of 17.3% female board members. This percentage provides evidence for the underrepresentation of women in businesses. Secondly, the average age of the directors in the data is 53.3 years (about 3 and a half months)the leverage ratio has an average value of 6.5%, indicating that the banks have a strong capital buffer in relation to their total exposure. Fourthly, the average age of female board members is 51 years, thus female board members are on average younger than male board members. Fifthly, the average ROAA of the data set is 0.519, meaning that the banks in question achieved on average a profit of 0.519% on their average total assets over a given period. Lastly, the average board size is 5.5 members, and the average total assets are 245.5 billion euros. Indicating the banks are on average large companies.

Furthermore, the minimum and maximum values of the gender diversity variable show that there are boards consisting out of only male directors, but not with only women (maximum 66.6%). The variable average age, which indicates the average age of the members, shows a small range from 44 to 60 years. Articles including that of Mahlo and Windsor (2021) explain this, namely that people's qualities and capacities develop with time and life experiences. Members of the board of directors have a great responsibility and therefore also require certain qualities and capabilities. From the table

the age range of the female members of the board takes on a broader range. This is striking, but there is no logical explanation. The number of observations of this variable is lower than other variables, because not all firms had female board members every year

Table 1.2 provides an overview of the differences between the mean values of the variables per country. The first thing that stands out is the low value of banks in Germany for the average share of female board members compared to the other two countries. In addition, it is also striking that the company size of the banks in Germany is also a lot higher. The explanation for this is simply that the data from the smaller banks in Germany was incomplete and unusable. Finally, the ROAA of Belgian banks takes on a remarkable value (0.979) compared to banks from the other two countries (NL: 0.445 and DE: 0.374). The banks within the sample located in Belgium seems to perform considerably better. They achieved a profit of 0.979% on their average total assets over the given period. The other countries show a value of less than half of it. The remaining variables in the table do not show any notable differences that require further explanation.

The last table with descriptive statistics was formed using a dummy variable for the share of women on the board of directors. It takes a value of 0 if the share of women on the banks' board of directors is lower than 25% and a value of 1 if it is higher. Based on this, the sample was divided into two groups shown in table 1.3. Column (a) shows the descriptive statistics of the group of banks where the share of women on the board of directors is lower than 0.25 and in column (b) of the group the share is higher or equal to this number. The table shows that banks with a share of female board members is higher or equal to 0.25 on average perform better. The average value of ROAA, which defines business performance, is higher for this group. The other variables do not show a striking difference in value.

Chart 1 visually shows the average percentage of women on the board of directors per country per year. The already discussed low value of the gender diversity ratio of the banks located in Germany compared to the other two countries, is clearly visible here. Furthermore, it is noteworthy that Dutch and Belgian banks scored relatively low in 2021, while German banks scored relatively high.

Table 1.1 Descriptive Statistics Dataset

VARIABLES	N	Mean	sd	Min	Max
Gender diversity	350	0.173	0.168	0	0.666
Average age	350	53.31	2.944	44	60
Leverage	350	0.0650	0.0450	0.0180	0.690
Average F.age	216	51	4.930	37	65
ROAA	350	0.519	0.891	-1.630	7.280
Board size	350	5.5	2.293	2	13
Total Assets	350	245.5	436.8	1.581	3,011
Country Group 0	120	0	0	0	0
Country Group 1	160	1	0	1	1
Country Group 2	70	2	0	2	2

Table 1.2 Descriptive Statistics of Mean Values by Country

	NL		GE		BE	
VARIABLES	N	Mean	N	Mean	N	Mean
Gender diversity	120	0.209	160	0.132	70	0.204
Average age	120	52.78	160	53.29	70	54.29
Leverage	120	0.0690	160	0.0570	70	0.0765
Average F.age	82	49.90	84	51.32	50	52.27
ROAA	120	0.445	160	0.374	70	0.979
Board size	120	5.100	160	5.368	70	6.486
Total Assets	120	199.8	160	315.1	70	165.1

Table 1.3 Descriptive Statistics by Share of Female Board Members

Female share		(a) <0.25					(b) ≥0.25			
VARIABLES	N	Mean	Min	Max	sd	N	Mean	Min	Max	sd
Gender diversity	226	0.0677	0	0.235	0.0845	124	0.365	0.250	0.666	0.0959
Average age	226	53.57	44	60	2.709	124	52.85	44.70	59.30	3.291
Leverage	226	0.0636	0.0200	0.690	0.0499	124	0.0676	0.0180	0.222	0.0345
Average age females	92	50.10	37	65	6.367	124	51.67	40	59.60	3.381
ROAA	226	0.358	-1.630	7.280	0.656	124	0.813	-0.590	4.810	1.153
Boardsize	226	5.415	2	13	2.264	124	5.653	2	11	2.348
Total assets	226	228.6	3.017	1,728	360.9	124	276.4	1.581	3,011	549.2

Chart 1 Average Gender Diversity Ratio per Year by Country
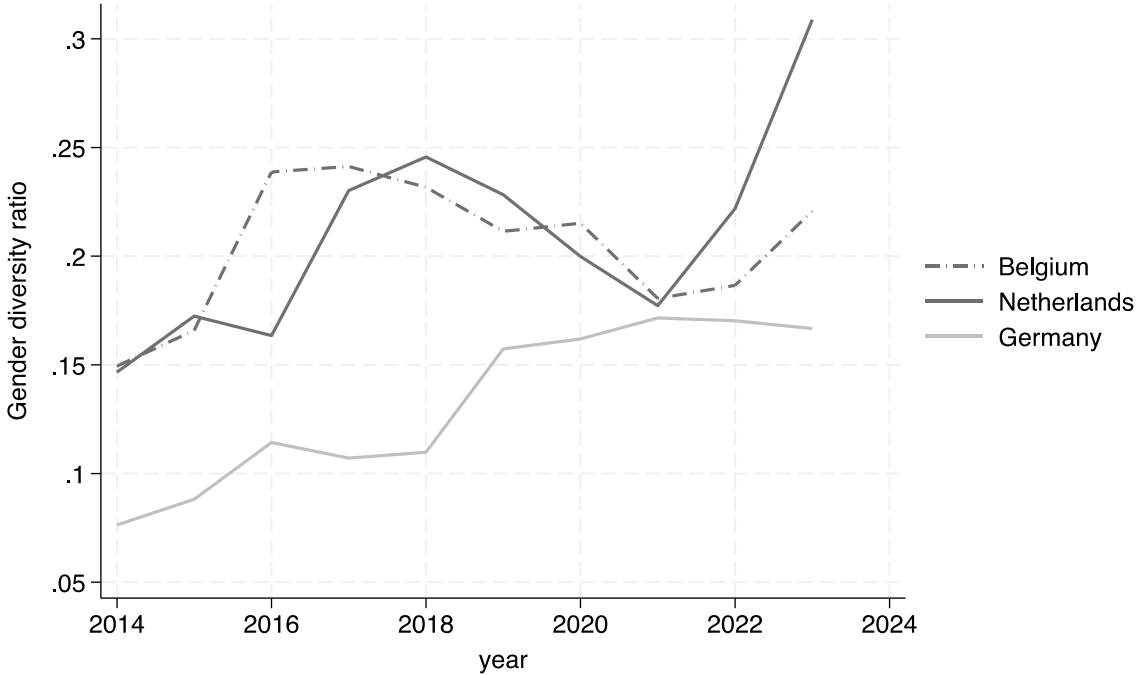
Chapter 4 Methodology

4.1 OLS Regression Model

The aim of the research is to study the relationship between between the gender diversity and average age of the board and company performance, and to what extent the impact of female board members is influenced by their age. The research first uses a OLS regression model using the panel data structure.

The first regression has the proportion of women on the management board as the main independent variable and the firm's ROAA (Return on Average Assets) as the dependent variable. The first regression will test whether there is a significant positive relationship between the proportion women on the management board on firm performance (*H1*).

$$1. \quad Y_{it} = \alpha_0 + \beta 1 Female_{i,t} + \beta 2 x_{i,t} + \epsilon_{i,t}$$

The dependent variable, Yit, is the ROAA of a firm, which indicates the performance of the banks in question. The ROAA is calculated by dividing a company's net income by the average total asset value of a financial year. α is the constant term in the regression models and *β1*, *β2* and *β3* are the estimated coefficients of the associated variables. $Female_{i,t}$ is the variable in the first regression that reflects the share of female members on the board. $X_{i,t}$ is a vector of all control variables, total assets, leverage ratio and board size. Lastly, $\epsilon_{i,t}$ the error term, *i* represents all the different companies and *t* is the year of the measurement.

The next regression tests the presence of a positive significant relationship between the average age of the management board on firm performance (*H2*). It contains the average age of the people on the management board as independent variable and the ROAA of the firm as the dependent variable.

$$2. \quad Y_{it} = \alpha_0 + \beta 1 Age_{i,t} + \beta 2 x_{i,t} + \epsilon_{i,t}$$

The regression in which $Age_{i,t}$ indicates the average age of the entire board.

The last regression uses an interaction term. It first includes the proportion women on management board and their average age as independent variables. The next added independent variable is the interaction term between the proportion women on the management board and their average age. The dependent variable is the ROAA of the firm. Including the interaction variable makes it possible to study whether the relationship between the proportion women on the management board on firm performance is different when their average age is higher *(H3)*.

$$3. \quad Y_{it} = \alpha_0 + \beta 1 Female_{i,t} + \beta 2 Female\ Age_{i,t} + \beta 3 (Female \times Female\ Age)_{i,t} + \beta 4 x_{i,t} + \epsilon_{i,t}$$

The regression in which $(Female \times Female\ Age)_{i,t}$ is the interaction term between the proportion women on the management board and their age.

4.2 Hausman-test

The Hausman test is a statistical hypothesis test used to decide whether a fixed-effects (FE) or random-effects (RE) model fits the regression the best. The main difference between the two models lies in the assumptions about the correlation between unobserved effects and independent variables. The FE-model assumes that the unobserved effects are correlated with the independent variables, while in the RE-model the unobserved effects are assumed to be uncorrelated with the independent variables. The null hypothesis of the Hausman test is that the RE- model is appropriate, while the alternative hypothesis is that the RE-model is not appropriate.

H0: Random effects model is appropriate

Ha: Random effects model is not appropriate

The hypotheses are tested for each regression used in this paper. Table A1 in the appendix shows the results of the Hausman-test. The test statistic of each regression has a value smaller than 0.05, making a fixed-effects model most appropriate for all. The fixed-effect model ensures robustness by controlling for unobserved, time-invariant heterogeneity. Using the OLS and fixed effects model makes a thorough analysis possible and enhances the validity and reliability of the research findings.

4.3 Fixed Effect Model

The use of the fixed effect model in addition to a panel regression model provides the necessary advantages. This research uses a panel data set, which means there is a chance of the presence of endogeneity. Endogeneity means that there may be a correlation between an explanatory variable in the model and the error term. In other words, a variable not included in the model influences one included. The fixed effects model can control time-invariant characteristics. Time-invariant characteristics do not change and are stable throughout the entire observation. Adding fixed effects to the panel regression model could be important for the causal inference in this study. Because the bank data is examined annually, there may be time-invariant heterogeneity. First, *time fixed effects* $x_{i,t}$ are added to the model. Secondly, *country fixed effects* $U_{i,t}$ are added to the model. This controls the unobserved heterogeneity between the three countries that may influence the banks' operating performance (ROAA). The regressions for the fixed-effect model are as followed:

1. $Y_{it} = \alpha_0 + \beta 1 Female_{i,t} + \beta 2 x_{i,t} + U_{i,t} + \epsilon_{i,t}$

2. $Y_{it} = \alpha_0 + \beta 1 Age_{i,t} + \beta 2 x_{i,t} + U_{i,t} + \epsilon_{i,t}$

3. $Y_{it} = \alpha_0 + \beta 1 Female_{i,t} + \beta 2 Age_{i,t} + \beta 3 (Women \times Age)_{i,t} + \beta 4 x_{i,t} + U_{i,t} + \epsilon_{i,t}$

Chapter 5 Results

5.1 Panel Regression Model

Table 2 presents the results of the initial regression analysis designed to test the first hypothesis. The variable of interest for this research, *gender diversity*, has a positive value in all the columns with a significance level of 0.01. The results of the model including board size as an additional control variable suggest that a higher share of female members on the board of directors is positively related to banks' ROAA. When the percentage of women on the board increases by 1%, the ROAA is on average approximately 0.9 levels higher, ceteris paribus. Remarkably, the coefficient of the Gender diversity lowers when the control variable for the number of members is included in the model, indicating a possible correlation between the share of female board members and the total number of board members. However, the table provides sufficient evidence to support the first hypothesis. The null hypothesis that stated no significant effect of the proportion women on the board on firm performance is rejected.

the results show a positive and significant relationship between a firm's leverage and the ROAA. However, the table shows a negative and significant relationship between the total assets and the dependent variable, which suggests lower business performance for bigger firms. Lastly, the results provide evidence of the positive relationship between the number of board members and firm performance.

Table 2 Regression Model with Gender Diversity as Main Independent Variable

VARIABLES	(1) ROAA	(2) ROAA	(3) ROAA
Gender diversity	1.017***	1.048***	0.899***
	(0.279)	(0.274)	(0.260)
Leverage		2.527**	2.163**
		(1.029)	(0.977)
Total assets		-0.000343***	-0.000603***
		(0.000106)	(0.000109)
Board size			0.135***
			(0.0211)
Constant	0.343***	0.258***	-0.375***
	(0.0673)	(0.0970)	(0.135)
Observations	350	350	350
R-squared	0.037	0.088	0.184

Table 2 shows the results of the panel regression model where the gender diversity ratio was used as the main independent variable. The first column shows the model that only uses gender diversity as an independent variable. The control variables Leverage and Total assets have been added in the second column. In the third column, the model from column two has been further expanded with the variable Board size. Standard errors in parentheses and *** $p<0.01$, ** $p<0.05$, * $p<0.1$ indicating the significance.

Table 3 presents the results of the regression analysis designed to study the second hypothesis. The results show that the relationship between the average age of board members and a company's ROAA loses significance when controlling the size of the management board. The average age of board members is no longer a significant independent predictor of a bank's ROAA. It suggests that the relationship seen in the second column can be largely explained by differences in board size. Adding the management board size as a control variable seems to have been important for the relationship between the average age of the board members and the dependent variable. The table does not provide sufficient evidence to confirm the second hypothesis. Thus, the null hypothesis of no significant differences cannot be rejected. Furthermore, the table once again shows a significant positive relationship between a company's leverage and ROAA and a significant negative relationship between company size and ROAA.

Table 3 Regression Model with the Average Age of the Board Members as Main Independent Variable

VARIABLES	(1) ROAA	(2) ROAA	(3) ROAA
Average age	0.0311*	0.0339**	0.0151
	(0.0161)	(0.0158)	(0.0153)
Leverage		2.843***	2.404**
		(1.042)	(0.991)
Total assets		-0.000315***	-0.000581***
		(0.000107)	(0.000110)
Board size			0.137***
			(0.0217)
Constant	-1.141	-1.396*	-1.059
	(0.861)	(0.846)	(0.805)
Observations	350	350	350
R-squared	0.011	0.062	0.158

Table 3 shows the results of the panel regression model where the average age of all the board members was used as the main independent variable. The first column shows the model that only uses the *average age* as an independent variable. The control variables *leverage,* and *total assets* have been added in the second column. In the third column, the model from column two has been further expanded with the variable *board size*. Standard errors in parentheses and *** $p<0.01$, ** $p<0.05$, * $p<0.1$ indicating the significance of each variable

Table 4 shows the results of the regression model including the interaction term of the proportion of female board members and their average age. The results again show the importance of the control variable for board size. Adding this variable causes a loss of significance of the independent variable gender diversity. The share of women on the board no longer has a significant explanatory role for the dependent variable, ROAA. This suggests that the significant relationship between gender diversity and ROAA, seen in the third column, can largely be explained by the number of members on the board. Furthermore, there is still a positive relationship between the interaction term and the dependent variable with 0.1 significance level. On average, for every one-year increase in the average age of the women, the effect of the proportion female board members on firm performance increases with 0.221 units, ceteris paribus Older female board members appear to be more strongly. The results of this regression model provide evidence to reject the null hypotheses of no significant differences. Furthermore, the table once again shows a significant positive relationship between a company's leverage and ROAA and a significant negative relationship between company size and ROAA.

Table 4 Regression Model with the Interaction Term as Main Independent Variable

VARIABLES	(1) ROAA	(2) ROAA	(3) ROAA	(4) ROAA
Genderd diversity	1.544***	-13.11*	-15.07**	-8.805
	(0.515)	(7.721)	(7.527)	(6.521)
Average age femals	0.0153	-0.0473	-0.0522	-0.0470
	(0.0130)	(0.0353)	(0.0346)	(0.0298)
(Gender diversity x Age of female members)		0.288*	0.320**	0.221*
		(0.151)	(0.147)	(0.127)
Leverage			2.623**	2.328**
			(1.214)	(1.046)
Total assets			-0.000372***	-0.000615***
			(0.000123)	(0.000110)
Board size				0.231***
				(0.0268)
Constant	-0.614	2.563	2.842	0.928
	(0.675)	(1.800)	(1.779)	(1.548)
Observations	216	216	216	216
R-squared	0.048	0.063	0.131	0.359

Table 3 shows the results of the panel regression model where the interaction term of the gender diversity and the average age of the female board members is used as the main independent variable. The first column shows the model that only uses *gender diversity* and *average age females* as independent variables. The interaction term is added in the second column. The control variables *leverage* and *total assets* have been added in the third column. Lastly, in column four the regression is further expanded with the variable *board size*. Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1 indicating the significance of each variable

5.2 Fixed Effects Model

Table 5 shows the results of the fixed effects model of the three conducted regressions for this research (column 1: regression 1, column 2: regression 2 and column 3: regression 3). The results of the fixed effects model provide further evidence for the negative and significant relationship between a bank's size and its ROAA. This relationship was already visible in each of the previous panel regressions. However, most of the other independent variables do not play a significant explanatory role for the ROAA within the fixed effect model. This suggests that the effect of the variables in question is not due to changes within a unit over time, but due to the differences between units. Besides the constant term in column 1 and the independent variable *total assets*, the only variable with a significant value within the fixed effect model is the average age of the female board members (column 3). However, in the panel regression model this variable did not have a significant value (table 4 column 4). It suggests that this variable is mainly influential through changes within units over time. The results in Table 3 show that the average age of board members does not have a significant impact on a bank's ROAA. The results of the last fixed effects model suggest that the association between the share of female

board members and ROAA is not significant, and not significantly different when their average age is higher, ceteris paribus.

Table 5 Fixed Effects Model

VARIABLES	(1) FE	(2) FE	(3) FE
Gender diversity	-0.148 (0.261)		3.724 (3.033)
Average age		0.0222 (0.0148)	
Leverage	-0.519 (0.703)	-0.589 (0.700)	-0.626 (0.414)
Total assets	-0.000423** (0.000209)	-0.000418** (0.000208)	-0.000301** (0.000118)
Board size	-0.0202 (0.0264)	-0.0243 (0.0264)	-0.00500 (0.0207)
Averge age females			0.0282* (0.0145)
(Gender diversity x Average age females)			-0.0725 (0.0599)
Constant	0.718*** (0.179)	-0.444 (0.785)	-0.699 (0.729)
Number of observations	350	350	216
R-squared	0.074	0.080	0.138
Country FE	YES	YES	YES
Year FE	YES	YES	YES

Table 3 shows the results of the fixed effects models. The first column shows the model with *gender diversity* as the main independent variable. The second column contains the model with *average age as* the main independent variable. In the last column the model with the interaction term as the main independent variable is presented. All the regressions contain the full set of control variables. Standard errors in parentheses and *** $p<0.01$, ** $p<0.05$, * $p<0.1$ indicating the significance of each variable

Chapter 6 Discussion and Conclusion

6.1 Discussion

6.1.1 Hypothesis Results

In this paper the relationship between the share of women and the average age on a board and firm performance are studied, and to what extent the relationship between the share of women and company performance is related to their age. The data of 35 banks located in Germany, Netherlands or Belgium is used to estimate OLS regressions and fixed effects models. In short, the results of this paper show a significant and positive correlation between the share of female board members and the firm performance of the banks and, which is strengthened when the average age of the women is higher. Furthermore, the relationship between the average age of board members and the performance of banks is insignificant.

The first hypothesis stated a significant positive relationship between the proportion of women on the management board and the firm performance of banks. The results in table 2 show that the ROAA of the banks is positively affected by the share of female board members. Suggesting, banks profit when they increase the gender diversity of the board. Therefore, the null hypothesis was rejected. The findings concerning the first hypothesis correspond to the expectations prior to the study. Several studies already suggested the positive effect of gender diversity, including Galletta et al., (2022), Jabari et al (2021), Endraswati (2018), Mateos de Cabo et al. (2012), and Mohammed et al. (2018). The positive effect of female board members could be due to the new perspectives, experiences and leadership styles they bring to the room. Women possess certain leadership qualities and characteristics better than men, for instance cooperation, collaboration and interpersonal sensitivity (Ely and Rhode, 2010).

The second hypothesis stated a significant relationship between the average age of the management board and firm performance of banks. The results in table 3 provide no sufficient evidence for the effect of the average age of the board on the ROAA. Therefore, the null hypothesis could not be rejected, which was against the expectations prior to this research. The results correspond to the findings by Kanakriyah (2021), which also suggest an insignificant relationship. A potential argument is that although a higher gender diversity leads to more diverse perspectives, experiences and values, it can also lead to conflict and a lack of consensus. Consequently, the decision-making process can be delayed or become complicated.

The last hypothesis in this paper stated that the relationship between the proportion of women on the management board and firm performance of banks is larger when the average age of female board members is higher. The results in table 4 showed significant and sufficient evidence to confirm the hypothesis. The significance of the interaction term suggest that older female board members are more strongly associated with ROAA compared to younger women, which aligns with the

expectations prior to this study. The articles by Haist et al. (2000) and Steffensmeier et al. (1998) already showed the potential significant interaction effect between age and gender in different settings. A possible explanation is that older women bring more knowledge and experience to board, which they accumulated in the industry unlike younger females.

6.1.2 Limitations

This paper faces a couple of limitations. First, the sample used in the research is limited to banks located in the Netherland, Germany and Belgium, which is relatively small. This may limit the generalizability to the whole population and the statistical power of the findings of the study. The sample is too small to draw broader conclusions. A sample of 35 selected banks located in the Netherlands, Germany and Belgium is used. All the data regarding the information of the management board was hand collected from the annual reports of the banks examined. Due to the limited time and data availability the dataset is relatively small and just a fraction of all the banks located in the studied countries. If the sample included more banks the statistical power of the study would improve, which lead to a greater possibility to detect significant relationships between the variables. In addition, the generalizability to the population also increases due to a bigger sample, making the conclusions more reliable and more widely applicable. The possibility of detailed subgroup analysis, such as investigating the differences between countries or banks, arises.

The three countries are all members of the European Union, so they face similar regulations from the European Central Bank (ECB). The study's findings are likely generalizable to other countries in the European Union. Countries located in other continents face other regulations, therefore a replication of this study may lead to different results here. The findings of this research are potentially less relevant for other regions with different economic and cultural contexts. Nevertheless, the choice of the banks did not depend on firm specific characteristics, but on the availability of complete datasets. As a result, the sample includes both large and small banks, which leads to a movement of the results towards a mean value that may correspond to the industry averages.

The second limitation is the number of years that could be examined. Both the data derived from the database Orbis Bank Focus and the annual reports were only available for a certain period. It varies between banks from which year annual reports are available. Some banks have only disclosed recent annual reports and therefore could not be used. In addition, the desired annual data derived from Orbis was also not available for multiple businesses. Eventually, a complete dataset of 35 west European banks over the period from 2014 to 2023 was conducted. Ideally the dataset would include information about many more banks and years. In a period of 10 years the economies can change a lot in the term of growth and participation of females. Adding more years and more banks located in Europa strengthens the results and may show a stronger relationship between the independent and

dependent variables. The influence of temporary fluctuations or one-time events on the results decreases, making the findings more representative of the firm's performance over time.

An additional limitation of the research is the limited measurement of firm performance. This paper only used a firm's ROAA, return on average assets, as an indicator for firm performance. Although there exist many more variables that indicate the performance of a firm, such as earnings per share, return on equity, gross margin, revenue and net income. Using multiple metrics for business performance provides benefits to the research interpretation. First, it provides a more complete picture of company performance when both financial and non-financial measurements of performance are examined. Additionally, it allows for a better comparison between firms and their competitors. It helps with the identification of the best practices and the areas that need improvements. Lastly, the use of only one or a few measures can cause a distorted or incomplete picture of performance. Adding more measurements of performance can solve this problem.

This paper is also limited due to a restricted set of control variables. Control variables help to isolate the effect of the independent variable by accounting for other factors that influence the performance of banks. Including more relevant control variables allows us to rule out potential disturbing factors that could bias the relationship between the variables of interest.

Another important limitation of the paper is that it is not causal in nature. The study is based on observations instead of experimental manipulations. Therefore, no conclusive cause-and-effect relationship can be observed between the researched variables. It is not possible to identify with certainty that the change in one variable is caused by another variable. In this paper only correlations could be identified. If the research included experimental manipulations a cause-and-effect relationship could be confirmed

The last limitation of this research is the potential distorted results due to selection bias. Only banks from which all necessary information had been released were used. As a result, most banks could not be included in the sample. The selection of the banks can lead to a bias if the sample is not representative of the whole population in the examined countries. If many more banks could be included, the bias will decrease, and representativeness will increase

6.1.3 Future Research
This study is the first to examine the potential effect of average age on the relationship between gender diversity of the management board and corporate performance. The results provide evidence and new insights on the relationship between the share of female board members and firm performance. As mentioned in the limitations, ideally the data set would have been larger. Therefore, it is recommended for future research to examine the relationship using a bigger sample. For instance, the data set used in

this paper could be extended with the data of banks located in countries that are also member of the European Union. As a result, the statistical power increases, the generalizability is better, and the chance of bias decreases.

In addition, it is likely to assume that the regulations in other parts of the world differ from the ones in Europe. Consequently, it is also interesting to investigate the data of different continents or to obtain possible differences or similarities in the association between gender diversity and firm performance. Or if sufficient data is available, countries can also be compared with individually. Moreover, this paper only researched the banking industry, so its results are not generalizable to other industries. As a result, it may also be interesting in the future to replicate the study in other industries.

Based on the previous section which argues the limitations of the research it may also be important in future research to add more years and control variables. The actual effect of the independent on the dependent variable will be better isolated. Lastly, it is recommended for future research to use other measures of performance. In this paper, only the ROAA of the banks indicated firm performance. Measures of financial performance, such as revenue, market share, profitability and cash flow can also be used in future studies. In addition, financial performance may not be the only thing effected by the share of female on the board. The correlation with social performance may also be interesting to study in the future.

6.2 Conclusion

Quantitative research has been conducted into the effects of gender diversity and average age on firm performance, indicated by the ROAA. The findings of the study show that the firm performance increases by the proportion of women on the board, which was in line with the expectations based on the reviewed literature prior the study. In addition, the findings suggest an even stronger positive effect when the average age of the women is higher, which also corresponds to the prior expectations. However, the results showed an insignificant relationship between the average age of all board members and firm performance. Although, prior to the research a positive and significant was expected. The findings are somewhat remarkable. Since the overall average age of the board members has no effect on the firm performance, but the influence of the proportion female board members is strengthened by the average age. In conclusion, this research has shown a significant positive association between the gender diversity of the management board and firm performance, which is strengthened by a higher average age of the females.

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Appendix

Table A1. Results of the Hausman-test

REGRESSION	Test Statistics (Prob>chi2)	Appropriate model
Gender diversity	0.0010	Fixed effects
Average age	0.0060	Fixed effects
Interaction	0.0009	Fixed effects