Boardroom gender diversity and firm performance: Evidence from publicly listed companies in the Benelux.

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"A diverse mix of voices leads to better discussions, decisions, and outcomes for everyone."

— Sundar Pichai, Chief Executive Officer of Google.

Women belong in all places where decisions are being made. It shouldn't be that women are the exception."

— Ruth Bader Ginsburg, Associate Justice of the Supreme Court of the US.

ABSTRACT

This thesis investigates the relationship between gender diversity in boardrooms and financial performance in publicly listed companies in the Benelux. Although, there are plenty of studies that focus on the relationship between gender diversity of boardrooms and a firms financial performance, a clear study focussed on the Benelux is not present. This thesis aims for further expand using existing research by assessing the effect of gender diversity in boardrooms of Benelux publicly listed companies. This thesis analyses data containing 1,480 firm-year observations over a time period of 2014 to 2023, in which it measures financial performance through Tobin's Q and Return on Assets (ROA). A panel data regression analysis is used to examine the impact of female board representation on firm performance. The results offer empirical insight into how female representation on boards correlates with firm performance and shows inconclusive results, based on the sample data. The results present deviating evidence, no statistically significant relationship was found between female representation in boardrooms and ROA (accounting based performance measurement), but a positive relationship was seen with Tobin's Q (market based performance measurement). These mixed results indicate that the effect of gender diversity on firm performance might differ depending on the performance variables used, this highlights the need for further research.

Keywords

Female Directors, Firm Performance, Benelux, Gender Diversity, Tobin's Q.

Preface

This thesis represents the final part of my Master of Science program in Business Administration, with a specialization in financial management at the University of Twente.

The research presented in this thesis explores the relation between gender diversity and corporate financial performance in boardrooms of publicly listed companies in the Benelux. The topic reflects my interest in financial analysis and the discussion on diversity and inclusion in corporate settings.

I would like to express my gratitude towards dr. Lingbo Shen and dr. Xiaohong Huang, as they were my first and second supervisor, respectively, during this process. Their guidance, feedback and support throughout the process has been extremely helpful. I also would like to thank my family and friends in their interest in my thesis.

I hope this work contributes to the ongoing conversation on gender diversity and firm financial performance and hopefully it can serve as a useful resource for the future research.

Sincerely,

Colin Smit

Oldenzaal, May 2025.

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List of Abbreviations

ROE	Return On Equity
ROCE	Return On Capital Employed
CEO	Chief Executive Officer
CFO	Chief Financial Officer
COO	Chief Operating Officer
ROA	Return on Assets
CI	Confidence Interval
Current Ratio	Current assets / current liabilities
Tobin's Q	The Q-ratio measures the relationship between a company's market valuation and its intrinsic valuation. To say, it estimates whether a business or market is overvalued or undervalued (Wolfe & Sauaia, 2003).

1 Introduction

A significant shift is currently underway in the world, as women demand greater power and equality. This global shift towards women's empowerment can have a significant influence on large corporations worldwide. The United Nations has set a goal to achieve greater gender equality, which is “Achieve gender equality and empower all women and girls” (Nations, 2024), also known as goal 5. In the context of empowerment, this implies that more management functions in companies should be fulfilled by women, in which the effect is not precisely clear. According to Kruisinga and Senden (2017), in the Netherlands, approximately 10% of the board of directors is comprised of female representatives. All three Benelux countries have empowered gender quotas for corporate boards in order to stimulate gender diversity. The Netherlands has a 30% quota sanction free (Reguera-Alvarado et al., 2017) and Belgium has a 33% quota sanction free (Martínez-García et al., 2022), while Luxembourg has a principle that for appointing new executives, companies must consider diversity principles which include gender equality (Brasseur & Lopez, n.d.). The Corporate Governance Monitoring Committee has acknowledged that gender diversity is of importance in company boards (Goyal et al., 2021; Lückerath-Rovers, 2013). Despite this, the European regulations in place are not effective and rather inefficient (Dobija et al., 2022), as Blommaert and van den Brink (2020) state that women remain underrepresented at the absolute top of companies. According to a news article published by The Guardian, a bias in executive functions persists (Padridge, 2024). They state that these functions are still male-dominated, and although women are more represented in non-executive roles in boardrooms, the women at the top of a firm are in a minority (Padridge, 2024). The research of Blommaert and van den Brink (2020) has shown that evaluators of companies have a certain ideal managerial model in which women are at a disadvantage. It is reported that the number of women in boardrooms has decreased by more than 10% over the past two years (Padridge, 2024), based on companies in the Financial Times Stock Exchange Index (FTSE) in London. This

persistent gender imbalance raises important questions about its broader implications for corporate governance and organizational effectiveness.

Several studies have examined the relationship between board gender diversity and firm performance, with findings varying over different regions. In the United States, Carter et al. (2010) and Shao and Liu (2014) found a positive relations between female representation on boards and firm performance.

In Europe Terjesen et al. (2016) have conducted a comprehensive study over 47 countries, analyzing 3,876 public listed firms. They reported that companies with higher female representation have a higher firm performance, based on Tobin's Q and return-on-assets. Since Terjesen et al. (2016) report their findings over all countries, and not country specific, it is of interest to look closer at the companies in the Benelux and compare findings. Their set of European countries contains the Benelux, but precise empirical evidence for the Benelux is not reported. However, more focused national studies counter these findings. Smith et al. (2006) on Danish firms and Matsa and Miller (2013) on Norwegian both found that board gender diversity worsens firm performance. The Benelux can either be more in line with Europe or other local regions. Interestingly, Matsa and Miller (2013) also observed that male dominated boards were more vulnerable to negative economic environments. While La Rocca et al. (2024) reported that female representation on boards has a positive impact on a firms performance in European firms, unfortunately results were published based on all firms in all countries. Despite these contributions, there remains a gap in the literature regarding the Benelux region. Although several studies have been conducted on the gender diversity of boardrooms and its influence on a firm's financial performance, there is no specific research for the Benelux. Soare et al. (2022) has investigated the effect of a policy reform in Belgium, and for the period 2010 to 2017 reported that more female representation

in boardrooms negatively affected firm performance. Marinova et al. (2016) reported that board gender diversity has a positive effect on Tobin's Q for Dutch companies in 2007. Additionally, Lückerath-Rovers (2013) found that in the Netherlands, firms performed better if there was at least one female present in the board, these results were based only on data from 2008. Luxembourg is not a popular area for firm performance research. However, one research has found a positive relationship between female representation and financial performances in the banking sector in Luxembourg over a time period of 1999 – 2013 (Reinert et al., 2016). As empirical evidence for Luxembourg, Belgium and the Netherlands is lacking, this leaves a gap in the literature. Notably, for the period from 2014 to 2023, there is a notable lack of local and focused research examining the long-term influence of gender diversity in boardrooms. Prior studies have demonstrated a mixed correlations between female executive presence and a firm's financial performance across various global regions. However, it remains unclear to what extent these findings apply to the Benelux, leaving a gap for further research.

To Address the existing research gap, this thesis investigates the following central research question:

> ***What is the impact of female board membership on the financial performance of publicly listed companies in the Benelux?***

This research question explores whether and how gender diversity in boardrooms affects firm performance across Belgium, Luxembourg and the Netherlands. Given the mixed findings in previous research and the missing evidence for the Benelux region, this study adopts a diverse approach. If further examines if this relationship is influenced by factors like firm size, firm age, male dominated sectors and effects based on the country of origin.

To guide this study, the following sub-research questions and hypotheses were developed:

1. Does female board membership influence the financial performance of publicly listed companies in the Benelux?
    - H0: Board gender diversity will not influence the financial performance of Benelux publicly listed companies.
    - H1: Board gender diversity will positively influence the financial performance of Benelux publicly listed companies.
2. Is the effect of board gender diversity on financial performance stronger in larger firms?
    - H2: The positive effect of board gender diversity on financial performance is stronger in larger firms.
3. Is the effect of board gender diversity on financial performance stronger in male-dominated sectors?
    - H3: The positive effect of board gender diversity on financial performance is stronger in male-dominated sectors.
4. Does the impact of board gender diversity on financial performance differ between countries in the Benelux?
    - H4: The positive effect of board gender diversity on financial performance is stronger in the Netherlands, compared to Belgium and Luxembourg.

These sub-questions and hypotheses are developed to address the research objective, to determine the impact of female board membership on firm performance in the Benelux, and to find possible conditions that may influence the impact of female board membership on firm performance. This will contribute to a better understanding of gender diversity's role in corporate governance and its effect on firm performance.

To find an answer to these research questions, this thesis is composed of different parts. First, there will be the literature section, in which relevant literature is reviewed. In this section, topics such as gender, corporate governance, and financial performance are explored, but also theories like the Agency Theory, Resource Dependence Theory and the Social Identity Theory. Second, the methodology section explicitly elaborates on how the research is conducted and outlines the steps taken in the data analysis. Third, the analysis results are presented and discussed. Due to copyright restrictions, the exact details of the data used for the analysis cannot be published, as this is prohibited by the data owner. Fourth, the variables, descriptive statistics, correlations and the results from the regression analysis are presented. Fifth, conclusions will be drawn from the results in order to accept or reject hypotheses that lead to answering the research question.

This thesis uses a quantitative research approach, in which data is analyzed. From the database, ORBIS by Moody's, information on 2046 companies was retrieved. After filtering, removing incomplete records and excluding financial service companies, only companies remained that contained details of their board members' genders. This information about gender diversity in boardrooms will be analyzed against the firm's ROA, and Tobin's Q (to these metrics will be referred to as financial performances). Tobin's Q is included as it takes market-based performance into account and adjusts for industry differences. Furthermore, additional information about the industry, incorporation date, firm size, and leverage was collected to serve as control variables and dummy variables. From the incorporation date, the age of the firm was calculated by calculating the difference between the incorporation year and the year of interest (2014 to 2023). From industry, a dummy is constructed that indicates if an industry is male dominated, or not. Descriptive statistics will be presented to confirm the accuracy of the dataset. Subsequently, a correlation table will be used to rule out multicollinearity. To test the different hypotheses I use a regression analysis, which

provides outcomes at a significance level of 5% ($p<0.05$), 1% ($p<0.01$) and 0.1%($p<0.001$). To ensure the reliability of the results, a Variance Inflation Factor (VIF) test will be added.

Given the absence of studies focused on the Benelux, this research can contribute to this research gap. Since then, it has also provided the opportunity to compare the outcomes of this study with those of other regions. That might show some differences or similarities. This study examines both the executive board and the supervisory board of a company, providing a more comprehensive representation of top management that significantly influences the company's financial performance. This also makes it more comparable, as in Belgium and Luxembourg, companies have a single board of directors, whereas the Netherlands has two boards of directors. Additionally, there is an influence from age, as well as the fact that executives are also shareholders of the company. However, since some limitations must be set to limit the scope of the research, this study will focus solely on the gender aspect of board members. The study conducted in this research is most closely aligned with the work of Lückerath-Rovers (2013), which analyzed Dutch companies using year-end percentages of female directors in 2007. The major difference is that since 2007, numerous changes have occurred globally. Therefore, investigating the period of 2014-2023 in this region could provide valuable insight and contribution to a more nuanced understanding of gender diversity’s impact on corporate performance.

2 Literature Review

2.1 Social Identity Theory

The Social Identity Theory, developed by Henri Tajfel and John Turner (Tajfel et al., 1979), is a theoretical perspective that integrates the psychology of the self with the psychology of groups. It has been used multiple times to assess organizational issues, thereby demonstrating its practical significance. The theory discusses that people favor individuals of their group over individuals of the other group (Mahmood et al., 2021). In this theory, individuals categorize themselves and others based on age, gender, religion, and institutional affiliation, which can lead to favoritism, prejudice, and stereotyping (Mahmood et al., 2021). This also means that in corporate settings, male shareholders and board members may prefer other male employees to advance to higher levels within the company. This framework helps explain the gender-based barriers women face in advancing to higher positions within organizations, particularly in corporate settings. The metaphor of the "glass ceiling" is relevant here. This metaphor describes the inability of women to progress past a certain point, regardless of their qualities and achievements (Purcell et al., 2010). While the Social Identity Theory explains the psychology behind favoritism, the metaphor refers to the biases that arise from this group-based behavior. Du et al. (2022) mention that some popular explanations for "the glass ceiling" metaphor are that there are differences between men and women. Psychological differences in risk-taking, as well as a taste for competition and negotiation, are popular elements of discussion. The "glass ceiling" metaphor specifically applies to qualified individuals who are unable to reach management-level positions due to artificial barriers, including attitudinal or organizational biases (Commission, 1995).

Moreover, there is the "glass cliff" effect, an extension of the "glass ceiling" metaphor (Cao et al., 2024). This "addition" refers to appointing women to management positions during a time when the company or economy is already in crisis. Meaning that in some way, the

trouble is being blamed on the women who are in the management position at that point, while they didn't have any influence on it, but their predecessors did (Cao et al., 2024). This phenomenon has also been observed in the UK, where research was conducted on the financial performance of companies at the top of the English Female FTSE 100 Index in 2003 (Lückerath-Rovers, 2013). However, when additional research on this same topic was conducted, it became clear that the companies where these women were appointed were performing worse before their appointment than after (Lückerath-Rovers, 2013). Additionally, when women attain management positions, they are often subject to more stringent evaluations and undergo stricter scrutiny (Goyal et al., 2021). Furthermore, according to Goyal et al. (2021) and Westphal and Stern (2006), female executives without a high-end background, such as top education, face significant challenges when attempting to reach management positions and boardrooms. A critical application of Social Identity Theory suggests that these patterns stem from group-based biases within organizations. According to Erhardt et al. (2003), board diversity is associated with greater knowledge, creativity, and innovation. This increased knowledge can bring a competitive advantage. Erhardt et al. (2003) also note that executive diversity, particularly in education, has a positive impact on organizational performance and facilitates more effective strategic decision-making. This finding, by Erhardt et al. (2003), is significant since it suggests that diverse educational backgrounds, often underrepresented among executive teams due to structural biases like the glass ceiling, can bring unique perspectives that improve decision-making and firm performance. This further supports the argument that increasing the gender diversity in top leadership roles is not only a matter of equity, but also one of strategic advantages.

2.2 Resource Dependence Theory

The Resource Dependency Theory, as introduced by Pfeffer and Salancik (1978), is a theory used to examine the membership composition of boards of firms in order to acquire external environmental sources (Hillman et al., 2009). Diversity in a company can bring new talents to the firm, and a diverse board composition can provide access to valuable components that were previously inaccessible (Dwiharti & Adhariani, 2018). Furthermore, Dwiharti and Adhariani (2018) specifically highlight four major benefits that can be gained through external environment connections: access to information and expertise, establishment of communication networks, support from key organizations and groups, and the creation of legitimacy. These benefits are relevant in the context of gender-diverse boards. Female board members often bring social and professional networks, which can accompany the networks of their male colleagues. This wider range of external connections can improve the firm's ability to access specialized information and expertise. Additionally, gender-diverse boards may improve the company's legitimacy from the point of view of stakeholders, showing inclusivity and ethical governance. When brough together, these factors can strengthen strategic decision-making and ultimately contribute to improved firm performance.

According to Dănescu and Popa (2022), the gender diversity of executives has a positive impact on dividend policies, as well as additional benefits, including an increase in financial performance. Dănescu and Popa (2022) also state that this is because women are more meticulous, pay more attention to detail, and have a greater desire to adhere to procedures, standards, and legislative compliance. Simultaneously, this can lead to a more comprehensive and informed consideration when making strategic choices (Perryman et al., 2016). In the studies by Kim et al. (2020) and Laurens (2022), it was also found that female executives create firm value, as they are more involved in executive activities.

However, the interpretation that women only possess qualities like meticulousness, discipline, or stricter compliance is risky since it leans towards gender essentialism. Furthermore, while the literature suggests that more women have a positive impact (Kim et al., 2020; Laurens, 2022; Perryman et al., 2016), it is essential to consider that causality may be present. Does a higher female representation lead to better outcomes, or do forward-looking companies tend to recruit more diverse management? This question of causality remains a challenge in many studies and should be acknowledged in the application of Resource Dependence Theory (Balogh & Yonker, 2024).

A possible downside to having a heterogeneous combination of executives is that with more diversification on the board, decisions are less likely to be made efficiently. This is because, in this setting, the opinions of all board members differ significantly from one another, which can lead to longer discussions, increased potential for disagreement, and more time-consuming decision-making processes. While such diversity can bring creativity and innovation, it can also take longer to find common consent, compared to more homogeneous boards (García-Sánchez et al., 2020). Making a good decision, from the point of view of the board members, is much harder when taking all diverse perspectives into account. Although, Dwiharti and Adhariani (2018); Hillman et al. (2007); Hillman et al. (2009) conclude that the resource dependency theory is connected to diverse members of the board of directors, there should be placed more emphasis on how firms can manage gender diversity more productively. This includes developing inclusive governance practices that both leverages the strategic advantages of male and female input, and minimizes inefficiencies in decision-making.

2.3 Agency Theory

The Agency Theory is a fundamental theory that discusses the relationship between the principal and the agent. The principal is the employer of the agent, and the agent performs tasks as expected by the principal. These tasks include the power to make decisions on behalf of the principal. In large companies, where the owners are shareholders, the shareholders serve as the principals, and the board members serve as their agents. The theory discusses the mismatch of interests of all individuals, principals, and agents, in which a conflict of interest may occur if the agent does not act in the same interest as the principal. In this context, gender diversity is increasingly recognized as a factor that can enhance board oversight. According to Cao et al. (2024) the efficiency and monitoring responsibilities of women on corporate boards are increased, thereby enhancing corporate governance and reducing probabilities of conflicts of interest. Similarly, Pinto et al. (2020) highlight that effective corporate governance reduces information asymmetry and agency costs. Madhani (2017) adds that improved monitoring through a diverse board structure contributes to better performance outcomes. In combination, Madhani (2017) and Cao (2018) therefore suggest that by increasing the number of female board members, the monitoring of management is improved, which eventually leads to a better firm performance. Also, Cao (2018) states that women bring new resources to the firm. This reinforces the argument that a balance between men and women in boardrooms improves corporate governance for firms. While corporate governance is different in countries and regions, a significant aspect of corporate governance is the gender diversity of board members. Dănescu and Popa (2022) argue that previous research on corporate governance has shown that the efficiency and functioning of corporate boards can be positively affected by gender diversity. Overall, empirical studies indicate that gender diversity positively influences the effectiveness and functionality of corporate boards, reinforcing the relevance of the Agency Theory in this context (Dănescu & Popa, 2022).

2.4 Corporate Governance and Gender Diversity in the Benelux

2.4.1 Legal Systems and Shareholder Protection

Typically, there are two different types of legal systems: common law and civil law. Within these law systems there are differences in how they operate. Common law relies on judged, broader legal principles and oral arguments (Vishny et al., 2017), while civil law relies on professional judges, legal codes and written records. Within civil law, there are different types, including French civil law, German civil law, and Scandinavian civil law. According to Vishny et al. (2017) the Benelux have French-civil-law and we have gotten this from the time Napoleon Bonaparte occupied the countries (Vishny et al., 2017).

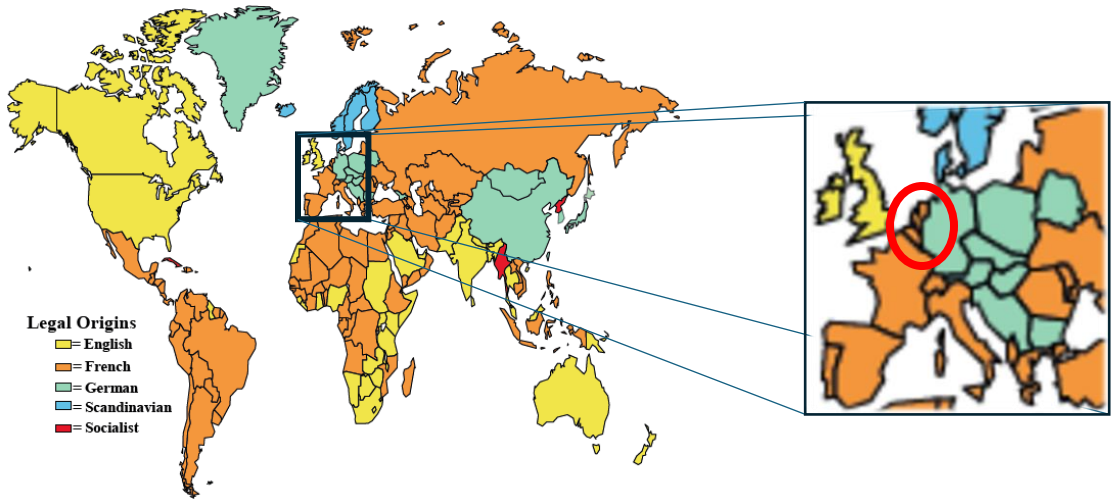

Figure 1: Global Legal Origins

Source: https://cepr.org/voxeu/columns/legal-origins

In the English common law system, investors in a company are more protected (Porta et al., 1998). Since these investors are more protected, it implies that they can take on more risk, pursue their own interests more than the company interest, and promote more gender diversity in the company (Terjesen et al., 2009). The German and Scandinavian civil law adopts a moderate stance on investor protection, whereas the French civil law offers the

least protection to company investors (Porta et al., 1998). From the perspective of Agency Theory, the weak investor protection in French civil law can imply that agency problems in these countries are more severe, resulting in higher agency costs and, consequently, less competitiveness on an international scale. On a national scale, this would not significantly influence the competitiveness outcome as much as it would internationally, since every company in the same country is subject to the same legal system. Simultaneously, there is no clear evidence that different countries favor different types of investors; rather, it appears that in common-law countries, all investors are favored (Porta et al., 1998). French-civil-law countries have heavier regulations, less security regarding property rights, and less political freedom compared to common-law countries. This greater insecurity of property rights is evident in the development of financial markets, which are less developed in civil-law countries than in common-law countries (Vishny et al., 2017). According to Porta et al. (1996), inadequate investor protection can lead to fewer small investors. This means that only larger investors and shareholders can retain their shares, as small investors will not invest capital in companies if they are not adequately protected. According to Social Identity Theory, this can lead to the dominant shareholders being more likely to favor in-group preferences, thereby continuing the “glass ceiling effect” and “the glass cliff effect”. This means that if there is greater shareholder concentration, the company will perform less well in terms of independence and gender diversity (Terjesen et al., 2009).

2.4.2 Gender Diversity Regulations

The Netherlands is far behind in the number of female executives (Lückerath-Rovers, 2010). According to Bernile et al. (2018) in 2008, the Benelux countries adopted binding quotas to promote gender diversity, but it is a relatively soft quota since there are no strict sanctions, which would be applied if a company does not meet the target set (Kruisinga & Senden, 2017). Luxembourg has a principle that companies must consider diversity principles when appointing new executives, which include promoting gender equality (Brasseur & Lopez,

n.d.). The Corporate Governance Monitoring Committee has acknowledged that gender diversity is of importance in company boards (Goyal et al., 2021; Lückerath-Rovers, 2013). Despite this, the European regulations in place are not effective and rather inefficient (Dobija et al., 2022). Despite the regulations, the growth and increase of female representation at the executive level, is rather slow and low (May 31st, 2016) (Kruisinga & Senden, 2017). This is also acknowledged by Iannotta et al. (2016) in their paper. They state that gender quotas are not a sufficient tool to increase the ratio of female board members. Although gender diversity quotas in the Benelux are made to improve board legitimacy and therefore improve access to resources, the weak enforcement of these quotas allows the social identity-based resistance to continue, and therefore it can lead to limitations of the potential benefits as described by the Resource Dependency Theory.

2.4.3 Board Structures Across the Benelux

Typically, Dutch firms use a two-tier system for their board structure (De Jong et al., 2005). Two-tier systems have two boards, one is an executive board and the other is a supervisory board (Block & Gerstner, 2016). The supervisory board is independent of the company itself (De Jong et al., 2005). The members of the executive board are appointed by the supervisory board, and the supervisory board is appointed by the shareholders (Block & Gerstner, 2016). The number of members on the executive board depends mostly on the company's size. The supervisory board size depends mostly on the share capital and the number of members within the executive board. The fact that these boards are separated leads to better division of monitoring and managing the company. This separation connects to the Agency Theory, in which it can lead to reduced agency costs and therefore improve the competitiveness of the Dutch companies.

Belgian and Luxembourgish companies use a one-tier system for their boards, which leads to a structure in which the executive and supervisory board are merged into one board of

directors (Block & Gerstner, 2016). Although it is one board, there is, however, a division between company executives and independent directors. As defined by Block and Gerstner (2016), the board of directors is divided between the Chief Executive Officer (CEO) and other executive directors (CFO, COO, etc.), a chairman (which is often the CEO), and numerous independent directors. The combination of monitoring and managing the company by one board potentially reduces their capacity of attracting diverse directors, unless independent directors are protected against the shareholder influences, suppressing out-group representation. Given the Dutch dual-board system, this study will treat the supervisory board and the executive board of Dutch firms as one board of directors. Although the boards are clearly different, the combining of the boards allows for the international comparison of the Netherlands with Belgium and Luxembourg. Female representation is therefore based on all members of both the executive and supervisory board of a company, as well as the total board of directors for Belgian and Luxembourgian companies.

2.4.4 Institutional Mechanisms and Their Impact on Governance

Unique institutional mechanisms also shape corporate governance practices. Dutch publicly listed companies can use foundations in order to protect companies from hostile takeovers (Greenberg Traurig, 2016). While this strengthens corporate stability, it can also entrench existing leadership and reduce board turnover, potentially suppress diversity.

The Netherlands also hosts the Enterprise Chamber of the Amsterdam Court of Appeal, a legal entity that allows stakeholders to initiate investigations into mismanagement (Bekkum et al., 2009). This institution enhances accountability and reinforces governance practices.

In Belgium, they have introduced loyalty voting rights. These rights are granted to shareholders who have been with a company for multiple years and aim to reduce short-termism (Declercq et al., 2023). Similarly, Luxembourg's Soparfi structures, enable tax-

efficient investments, attracting multinational investors but also concentrating shareholder power (Runcapital, 2024)

These institutional and regulatory factors shape how gender diversity in boardrooms is implemented an perceived in the Benelux. Weak investor protection, symbolic diversity measures and concentrated ownership structures pose challenges to effective governance reform. Neverthelss, identifying and focusing on boards with clear governance responsibilities, offers a viable path to assessing the role of gender diversity in improving firm performance.

2.5 Financial Performance

The relationship between gender diversity and financial performance can be explained through multiple theoretical lenses and is supported by various empirical findings. Dănescu and Popa (2022) conclude that the gender diversity of board members is positively associated with dividend policies, as well as other benefits, including an increase in financial performance. This is particularly relevant in the Benelux, where firms are embedded in civil-law legal systems with weaker investor protection, potentially enlarging agency problems. This is conceptually aligned with the Agency Theory, as gender diversity is associated with improved monitoring and corporate governance (Perryman et al., 2016). Additionally, female board members tend to pursue more risk-averse strategies, potentially resulting in reduced agency costs and a more sustainable risk profile (Perryman et al., 2016). This is important in Benelux firms, where investor protection is lower and agency costs are higher compared to common-law systems. This outcome directly supports the Agency Theory proposition that lowering agency costs improves organizational competitiveness (Hendrastuti & Harahap, 2023). Empirical findings reinforce these theoretical insights. Dobija et al. (2022) find that even under more conservative risk profiles, firm performance may continue to improve.

Similarly, Erhardt et al. (2003) mention, through other sources, that the gender diversity of boards has a positive correlation with a firm's financial performance.

Beyond internal governance, the benefits of board diversity also resonate with the Resource Dependency Theory, which suggests that diversity brings new resources to a firm, resources that were not previously available in homogeneous boards (Hillman et al., 2009). Furthermore, it aims to enhance a company's external competitiveness (Nienhüser, 2008). In the Benelux, this is relevant given the international orientation of firms operating from hubs like Luxembourg and the Netherlands, which depends on external reliability and reputations to secure investments. Laurens (2022) supports this, as her research has shown that the presence of women on boards has a significant impact on the company's stock price. The study observes that companies with 20% to 40% of women in top functions, are associated with the highest performance results. The research by Campbell and Mínguez-Vera (2008) and Conyon and He (2017) found multiple areas of increased stock value following an increase in female representation in company management. This can be explained, as female executives tend to achieve a higher ROI and EPS (Carter et al., 2010), a trend confirmed by Lückerath-Rovers (2013), who reports that more diverse companies have a 91% higher EBIT, a 11% higher ROE, and a stock price that has grown by 36%.

However, the Social Identity Theory explains that there is a gender bias in board member appointments due to group favoritism and stereotyping (Hogg, 2016). Despite performance improvements connected to female leadership, many organizations still resist diversifying the highest level of management, due to more negative evaluation of the out-group compared to the in-group, and since the often-failure of allocating resources to out-group members (Hogg, 2016). This dynamic is visible in the Benelux, where gender quotas exist but the enforcement remains weak. This might also explain the adverse market reactions to more female board members. For instance, Norway's gender quota led to a decrease in the

value of the stock (Conyon & He, 2017). These examples may suggest a market perception shaped by the social identity of individuals, in which the appointment of female executives is perceived as less valuable.

2.6 Hypotheses

The regression analysis requires various hypotheses to be accepted or rejected based on the outcome of the regression analysis.

H0: Board gender diversity will not influence the financial performance of Dutch, publicly listed, firms.

H1: Board gender diversity positively influences the financial performance of Dutch publicly listed firms.

This hypothesis is based on the Agency Theory, Resource Dependence Theory and the Social Identity Theory. The Agency Theory suggest that increased gender diversity can improve board oversight and reduce agency costs, which leads to better firm performance (Madhani, 2017). The Resource Dependency Theory suggests that women bring unique skills, perspectives and access to additional resources compared to their male colleagues. These skills, perspectives and resources can improve board effectiveness and strategic decision-making (Dwiharti & Adhariani, 2018). The Social Identity Theory proposes that boards that are gender diverse, may reduce ingroup reasoning and fosters a more constructive discussion that can lead to better strategic outcomes (Erhardt et al., 2003). Studies by Dănescu and Popa (2022) and Perryman et al. (2016) state that gender diversity, defined as more female representation, positively influences the financial performance of firms. Hence, the hypothesis predicts that the presence, in percentage, of female board members positively influences the financial performance of a firm.

H2: The positive effect of board gender diversity on financial performance is stronger in larger firms.

Larger firms might attract greater attention from investors, media, and the public (Fombrun, 1996). This can result in a more visible diversity in the board members. While simultaneously, more females can send a stronger progressive and socially responsible signal, which improves the reputation of the company (Bear et al., 2010). For the financial performance of a company, the size is also of importance since larger firms can get capital more easily (Hillman et al., 2007). Adams and Ferreira (2009) mention that in larger firms, corporate governance structures are more likely to be monitored and formalized, since there are often more shareholders who all have their opinion on governance and female representation within the company. Taken together, it is suggested that gender diversity among boards may lead to a better reputation, governance and firm performance in larger firms. The increased socially responsibility signal amplifies the positive effect of female representation in larger firms, while better monitoring of their corporate governance structures may benefit more from the contributions of a gender diverse boardroom. Therefore, the hypothesis states that the positive relationship between female representation and financial performance is stronger in larger firms, compared to smaller firms.

H3: The positive effect of board gender diversity on financial performance is stronger in male-dominated industries.

To consider the different characteristics of different industries in which variables like customer preferences and acceptance of female leadership can differ a lot, a control variable is used to find industry influences on financial performance in the dataset. This prevents overgeneralization across different industries, while some industries may have a different relationship between gender and financial performance. Elsaid and Ursel (2011) state that some male-dominated sectors may be more resistant to female leadership due to

stereotypes and informal networks, for example, in mining, construction, and heavy manufacturing. However, these sectors could benefit exponentially from female board membership since the performance impact of gender diversity may be higher in male-dominated sectors due to the homogeneous environment. Thus, while acceptance may be lower in male-dominated sectors, the profitability from increasing gender diversity could be higher. Hence, the hypothesis states that gender diversity has a stronger impact on firm performance in male-dominated sectors.

H4: The positive effects of board gender diversity on financial performance is stronger in the Netherlands, compared to Belgium and Luxembourg.

According to the institutional theory an organization is shaped by their institutional environment, which include official rules and informal norms (Lammers et al., 2014). Dutch firms have an environment with more value to gender equality, diversity and inclusiveness. This can translate into stronger stakeholder support and reputation benefits for companies that have more female executives (Terjesen et al., 2009). Simultaneously, Belgium and Luxembourg are more conservate when it comes to gender norms and have a slower progress to gender equality in executive functions (European institute 2023). These differences can lead to more female board members in the Netherlands where their presence is more likely to influence the financial outcomes positively due to stronger support and alignment with institutional norms. Additionally, the Netherlands has a two-tier board system, which separates the executive board from the supervisory board. The fact that these boards are separated leads to better division of monitoring and managing the company. This separation connects to the Agency Theory, in which it can lead to reduced agency costs and therefore improve the competitiveness of the Dutch companies. Therefore, the hypothesis states that the positive effect of board gender diversity is strong in the Netherlands.

3 Methodology

3.1 Research Approach

For this research, a quantitative approach is chosen. As stated by Taherdoost (2022) a quantitative research approach is based on numerical values, which are gained from observations in order to explain what is happening. The research in this thesis paper is most in line with the research of Lückerath-Rovers (2013) and the Correlational Research methodology as described by Taherdoost (2022).

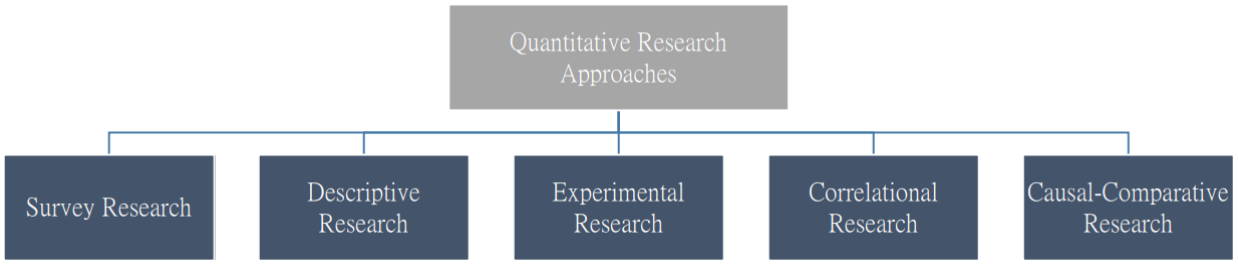

Figure 2: Quantitative Research Approaches

Taherdoost, H. (2022). What are different research approaches? Comprehensive Review of Qualitative, quantitative, and mixed method research, their applications, types, and limitations. Journal of Management Science & Engineering Research, 5(1), 53-63.

Since the data is available through a database, as described in section 3.2 Data Collection from Orbis by Moody's, this means that there is a general structure and standardization in the data that is of interest. Simultaneously, since the data is quantitative, this implies that it is more reliable and more objective (Almeida et al., 2017). In order to make sure that it is unbiased and allows for more objective interpretations, statistical tools and methods will be used, as descripted in 3.3 Data analysis. Also, this provides a better insight of trends in a large data set (Yilmaz, 2013).

3.2 Data Collection from Orbis by Moody's

The sample is collected from the database: Orbis. This database is currently owned by Moody's and provides information about various details of companies on the globe. For this research, the interest lies with the Dutch, Belgian and Luxembourgian public listed companies. Public companies have their financials published annually and more openly than private listed companies. This allows for a better availability of data and improves the possibility to validate this research if wanted.

To find relevant data, a Boolean search string was used consistent of 3 search steps. In this Boolean search string, all 3 steps were combined with AND statements, making sure that all are considered as TRUE to select companies that meet all three of the constraints. First, a filter based on region/country was applied in which Belgium, Luxembourg and the Netherlands were selected. Second, the status of the companies was set to active companies only. Finally, it was filtered on listed/unlisted companies, in which only publicly listed companies were selected. For all of the 2.027 results, return-on-assets (ROA), leverage, Tobin's Q and the sector in which the company operates (including NACE Rev. 2, core business code) were downloaded from the database. Additionally, to have some more control variables, the company size (measured as Total Assets in Millions of Euro's) was downloaded. By choosing to download the ROA and Tobin's Q, eventually results can be compared with other studies focusing on these variables (La Rocca et al., 2024; Terjesen et al., 2016).

There is one major problem with the data export from ORBIS, as it is in 'Wide' format instead of 'Long' format, which means that the data must be transformed from 'wide' to 'long' and this is done with Excel Power Query, (M-code can be found in Appendix B). Eventually this leads to a datasheet having only unique rows in which each row in the dataset is one observation for a specific firm in a specific year for a specific executive. In order to focus

more, only members of the executive board, supervisory board and board of directors will be taken into consideration in the analysis, since Belgium and Luxembourg use a single Board of Directors and the Netherlands uses an Executive Board and a Supervisory Board. (Buchheit et al., 2019; Luciano & Wang, 2018; Nguyen & Van Nguyen, 2024). Taking these 3 boards into consideration makes perfectly sense, since in the Netherlands there is the separation of the boards, and to assess total female representation, we would need both the executive board and the supervisory board consolidated information. For Belgium and Luxembourg, the Board of Directors is sufficient, since they have one board per company.

3.3 Data analysis

Now that there are 2.027 results left, the relevance and completeness of the data is being assessed, by filtering in Excel. First, a filter was applied to get companies with available data in 2023, by filtering on the last available year that is available. In this filter, 2023 and 2024 were included to make sure that empty rows are left out.

Secondly, a filter is applied to make sure that the gender of the board members is available for all. Blanks and cells with 'No data fulfil your filter criteria', 'n.s.' and 'n.a.' are filtered out, since we only can consider board members for which their gender is available.

Thirdly, we apply filters to the financial metrics exported from the Orbis database. In these filters the 'n/a'- and 'n/s'-cells are filtered out, since only cells that contain financial information are of interest to this research. Advantage with filtering is that now only rows are left in which all required data is available and no statistical errors occur later when analyzing the data (Henseler, 2023b). After all filters are applied, 146 companies remain for the analysis. From these 146 companies, 5 companies are excluded since they are in the

financial or banking sector. According to Marinova et al. (2016), these companies use a specific way of accounting and by doing so, Tobin's Q is affected.

After the data has been filtered and cleaned, it will be used to assess if gender diversity per company has significant influence on the financial metrics of the company. In the data analysis, descriptive statistics will be computed, to check completeness of the data and to find potential outliers. Cook's distance will be used to find outliers, therefore Cook's distance is set to the value of 1. If outliers are found, they will be removed from the data sample to keep validity for this research. The descriptive statistics will provide insight in the mean, median, standard deviation for all financial metrics and the distribution of gender. This will be visualized in tables, charts and boxplots.

After the descriptive statistics are done, a correlation matrix will be made. The correlation matrix shows how much the variables are correlated, with a value between -1 and +1. In which a correlation of +1 means a positive correlation that is perfectly correlated and for -1 vice versa. A correlation of 0 means that there is absolutely no correlation between variables. If there is a strong correlation between independent variables, this shows that there is a risk of multicollinearity (Henseler, 2023a). If this is the case, a principal component analysis will be conducted to reduce collinear metrics.

To get insight in the influence of the independent variable on the dependent variable, a multiple linear regression analysis will be executed. According to Henseler (2023c), a regression analysis examines linear relationships between one metric dependent variable and one or more independent variables. It can be used to make analyses of causes and for predictions. In the data analysis, the sector is used to find effects of male dominated industries through a binary dummy variable MaleDom. The firm size, the leverage (D/E ratio), firm age and the country are control variables, since these have influence on the overall

financial performance of a company. The model for the simple regression analysis is formulated as follows (Henseler, 2023c):

Model for the simple regression analysis

$$y_{it} = \beta_0 + \beta_1 * FemalePresence_{it} + \beta_2 * FIRMSIZE_{it} + \beta_3 * LEVERAGE_{it} + \beta_4 * MaleDoM_{it} + \beta_5 * FIRMAGE + \sum \gamma_t YearDummy_t + \sum \theta_c CountryDummy_c + \varepsilon_{it} \quad (1)$$

The control variable of Firm Size, is manually calculated as the logarithm of total assets (log(Total Assets)), following the research of Ding et al. (2021). The firm age is determined by subtracting the number of the current year, with the year of incorporation. The total size of the board of directors, is not taken into account since female representation is calculated as the percentage of females compared to the total number of board members. Adding board size as a variable could cause multicollinearity problems in the regression analysis.

In which the error term (ε) assumingly has a normal distribution (Henseler, 2023c):

Distribution of the Error-Term

$$\varepsilon \sim N(0, \sigma^2) \quad (2)$$

and can be calculated as the difference that the dependent variable differs from the expected value, by a random amount (Henseler, 2023c):

Difference of dependent variable from its expected value

$$y - E(y|x) = \varepsilon \quad (3)$$

For each hypotheses a slightly different regression analysis is required. This is because each hypothesis requires adding different interaction terms that provide insight into the effect of

female representation on different dummy and control variables. For the second hypotheses, an additional interaction term must be added: %Female* FirmSize. For the third and fourth hypotheses, also additional interaction terms must be added:

%Female * MaleDom and %Female * Country, respectively.

There are several outcomes of the linear regression model that are of interest. From the model summary, we can evaluate the proportion of variance in the dependent variable that is explained by the independent variables in the model (R^2), this is commonly known as the model fit. A higher R^2 tells us that the model is a better fit. In addition to the R^2, the Adjusted R^2 will also be reported, as it adjusts for the number of explanatory variables in the model and penalizes for the inclusion of unnecessary variables that do not significantly improve the model's explanatory power. A smaller deviation between R^2 and Adjusted R^2 indicates that most of the variables in the model contribute to explaining the variation in the dependent variable, this suggest that the model is well-specified without containing irrelevant predictors. From the ANOVA, we can evaluate the F-statistic that tests the null hypothesis that none of the predictors have an effect. A high F-value means that the model explains more variance than expected by chance. In combination with the p-value, the null hypothesis can be accepted ($p > 0.05$) or rejected ($p < 0.05$) and it can be concluded that the model does not or does, respectively, explains a statistically significant amount of variation in the dependent variable. From the actual regression, the coefficient table, it shows the effect of board gender diversity on the dependent variable, after controlling for leverage, firm size, year, country and male domination in sectors. It shows the effects (unstandardized) of each of the independent variables on the dependent variable, in combination with its statistical significance (p-value). Furthermore, the t-value tells how strong the evidence is that an independent variable has a positive or negative effect on the dependent variable.

4 Variables and Analysis Results

4.1 Variable Definitions and Measurements

For testing the relationship between board gender diversity and the financial performance of a firm, I will use three types of variables. Dependent variables (DV), Independent variables (IV) and control variables (CV). In order to be able to compare findings between countries, the Dutch two-tier system will be treated as a one-tier system. The dependent variables are influenced by the independent variables, in which also control variables can have an effect. Since this research is interested in the presence of female board members, the main independent variable is the female representation, calculated in percentage of females based on the entire size of the board.

For the regression analysis, it is of importance that variables are approximately normally distributed, meaning that they do not have to be completely normally distributed, but merely tend to be. They should have a skewness between -1 and 1, and the distance between the median and the mean is preferably smaller than one standard deviation.

4.1.1 Dependent Variables

By far ROA is used mostly as indicator of financial performance (Almarayeh, 2023; Fernández-Temprano & Tejerina-Gaite, 2020; Kılıç & Kuzey, 2016; Kweh et al., 2019), and in order to improve the comparability I will also use ROA to assess financial performance. Next to ROA, Tobin's Q is also used frequently in order to assess financial performance (Arora, 2022; Arvanitis et al., 2022; Brahma et al., 2021; Campbell & Mínguez-Vera, 2008; Marinova et al., 2016). In order to execute and test for robustness, a lot of studies use ROA and Tobin's Q in combination (Adams & Ferreira, 2009; Carter et al., 2010; Zhang, 2020). In order to improve comparability, this study will use ROA and Tobin's Q in order to score financial

performance. Additionally, the correlation between ROA and Tobin's Q can be assessed and possible effects can be found.

4.1.1.1 Return on Assets (ROA)

ROA gives insight in the firm's ability to generate revenue from a portfolio of its assets and is measured as historical amortized costs (Carter et al., 2010). ROA is calculated by dividing a company's net income by its average total assets. ROA measures the firm's ability to generate revenue by using its assets effectively. While checking for normality, it is found that ROA is skewed to left (-1.210), and this means that ROA is not normally distributed. Although it is a little skewed to the left, it is not out of proportion and does not require a log-transformation in order to correct for the skewness. Additionally, the median and the mean are not distanced from each other as the difference is only 0.001. To check for normality again, the distance between the median (0.040) and the mean (0.041) should be less than one standard deviation (0.091) away in order to be approximately normally distributed. As this is the case, since the difference between the median and the mean is 0.001, ROA can therefore be considered as approximately normally distributed. Hence, it is proper to use in a regression analysis.

4.1.1.2 Tobin's Q (Log(TobQ))

The general idea exists that better firms can create more economic value from a given set of assets. Tobin's Q measures the relationship between a company's market valuation and its intrinsic valuation. To say, it estimates whether a business or market is overvalued or undervalued (Wolfe & Sauaia, 2003). Tobin's Q is calculated by the sum of market value of equity plus the book value of the total debt, which is divided by the total book value of all company assets (Brahma et al., 2021). If Tobin's Q is less than one, the company uses its available resources poorly. Contrary, firms with a Tobin's Q of more than one, are expected to create more value from the usage of its available resources (Campbell & Mínguez-Vera,

2008). In the dataset, the skewness of Tobin's Q is highly to the right, which is suggests that Tobin's Q is not normally distributed. In order to correct the skewness, the logarithm was calculated. The logarithm of Tobin's Q is not unseen in literature (Dezsö & Ross, 2012; Terjesen et al., 2015), and is commonly used to reduce the skewness of the dataset. To test for normality again, as also mentioned in the previous paragraph, the distance between the median (-0.153) and the mean (-0.156) is less than one standard deviation (0.393) and therefore Log(Tobin's Q) can be considered as approximately normally distributed.

4.1.2 Independent Variables

In this study, female representation is measured in two variables. One in which the percentage of women compared to the total board size is calculated and one dummy variable that represents 1, if there is at least one female director was present that year and 0 if the board was completely male. While the representation of female directors is the main independent variable of interest, the dummy variable allows to test for robustness.

4.1.2.1 Female Presence (%Female)

This independent variable calculates the female presence on the board of directors. It is calculated for each year in this study, 2014-2023, by dividing the number of female board members by the number of total board members and multiplying it by 100 (Carter et al., 2010; Erhardt et al., 2003). By doing so we have a percentage of female board members for each year. For Female Presence the Skewness is 0.246, which is almost perfect for to be a normal distribution (skewness = 0.000). Since the skewness is between –1 and 1, the skewness does not requires a correction. Additionally, the distance between the median (0.184) and the mean (0.189) is less than one standard deviation (0.108) away, making the variable usable for a regression analysis and it is approximately normally distributed.

4.1.2.2 Dummy Female Present (DFemale)

In order to check for the effect of women to be present on a board, the dummy variable of Female Present is used. This dummy variable is 1 if in a certain year there is at least one female director on the board, and 0 otherwise (Campbell & Mínguez-Vera, 2008). By using this dummy variable the impact of at least one female director on the board can be assessed, and connects to previously executed studies (Campbell & Mínguez-Vera, 2008; Marinova et al., 2016). Although the variable has a negative skewness of -3.106, the difference between the median (1.000) and the mean (0.920) is less than one standard deviation (0.271). Based on the skewness, a correction would be in place by taking the logarithm, but since a Binary independent variable is perfectly fine for a regression analysis, we do not correct for the skewness. The binary variable does however have a very high mean compared to the possible values of 0 and 1, and therefore we can already conclude that a lot of boards contain at least one female, in many years.

4.1.3 Control Variables

Besides the effect of female representation in board on the financial performance of a firm, there are also other factors that can influence a firms performance. In order to account for these effects, a set of control variables is used to better understand the causal relation between performance and female representation. In order to control for the effect between the dependent and independent variables, 3 control variables were used.

The first control variable is the firm size, measured as the book value of total assets at the end of year, in millions of Euro's. We use the logarithm of Total Assets and therefore are in line with prior studies (Campbell & Mínguez-Vera, 2008; Dezsö & Ross, 2012; Fernández-Temprano & Tejerina-Gaite, 2020; La Rocca et al., 2024).

The second control variable is firm age, calculated by subtracting the incorporation year from the year in the panel data (2014 to 2023). To be more specific, if the data in row X would be

corresponding with 2020 and the incorporation year is 1990, we calculate the age as 30 years. This control variable is added to take the stability of older firms into account (Dezsö & Ross, 2012), arguably the firms are more experienced and therefore can make strategic choices better. Due to the high skewness of the ages in the dataset, the logarithm was used in other to correct for the skewness and make the data more usable for a regression analysis.

The third control variable is leverage, which is calculated as the ratio of total debt to total equity (Campbell & Mínguez-Vera, 2008; Simionescu et al., 2021). The leverage ratio provides insight in the portion of financing it takes on as a debt compared to the capital, or equity, that is available within the company. Due to the high skewness, the logarithm is taken. By doing so, the skewness is reduced and the distribution is more in line with a normal distribution and therefore usable for a regression analysis.

The last control variable is the sector in which the company operates. Since there are a lot of different sectors and these sectors have their own characteristics, it is of interest to take this into account. Additionally, there is a binary dummy variable for male dominated sectors, MaleDom, 1 if the sector is male dominated (Leoncini et al., 2024), and 0 otherwise, since we want to test of the influence of %Female has a weaker effect in male dominated sectors. A table can be found in Appendix C: Table of Male Dominated Industries, which was used in order to classify male dominated sectors.

4.2 Analysis Results

4.2.1 Descriptive Statistics

Figure 3 shows the mean percentage of female representation in boardrooms of the companies in the dataset. It shows a positive curve, which shows that on average the representation of women in boardrooms has increased (in percentage), over the Benelux. For the sample period of 2014-2023, the representation has increased from 15.7% to 22.7%. The

average increase over the sample period is 0.8%. For Belgium, the average female representation has increased from 17.9% to 23.9%, with an average increase of 0.4% yearly. For Luxembourg, the average female representation has increased from 19.3% to 24.8%, with an average increase of 0.45% yearly. The Netherlands has the lowest starting percentage and the lowest ending percentage, with 11.0% and 20.3%, respectively. The Netherlands does however have the highest average increase, with 0.93% yearly. From this data, we can see that the Netherlands was behind on female representation in 2014, but has managed to increase female representation more rapid than Belgium and Luxembourg.

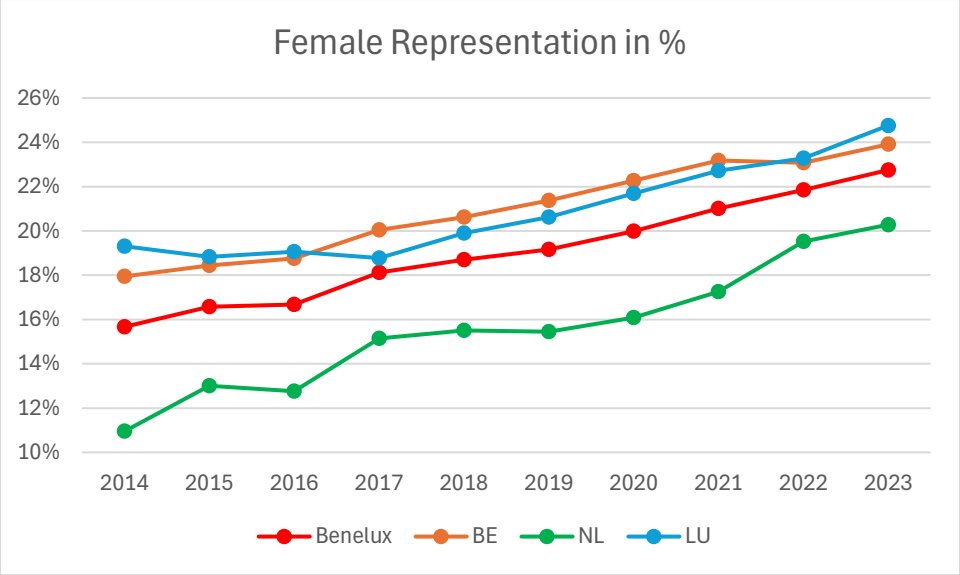

Figure 3: Average percentage of women on boards (2014-2023), for the Benelux and each country separately.

Table 1 shows the descriptive statistics of variables. As can be seen, the average number of female representation is 18.9%, with a standard deviation of 10.8% and a maximum of 57.1%. From this percentage of female representation, we can conclude that women are still a minority in the sample. Almost all firms have at least one female present in the boardroom, as the average of DFemale is 92.0%. Although there also is a company with no female board members, as the minimum value of %Female is 0.000. Note that the maximum of DFemale

is 1.000, but this doesn't imply that there is a company with 100% female board members, as this is a dummy variable. This dummy variable is binary and therefore only contains zeros and ones. We can also look at the median of %Female, which shows us that 50% of the boards of companies are made up of less than 18.4% women.

When looking to the ROA in table 1, we can see that on average a company returns 4.1% on their assets. The very small difference in the median and mean of ROA tells us that the distribution is possibly normal. From the standard deviation, minimum and maximum value we can conclude that there are some outliers, as these values differ significantly from the mean.

Tobin's Q shows a mean of 1.035 in table 1, meaning that the companies in the sample are slightly overvalued, on average. The median of Tobin's Q, of 0.703, means that less than 50% of the companies in the sample are accurately valued since it is below 1.000. Furthermore, the variable tells us that most firms are valued below replacements cost, but some are highly overvalued since the maximum value observed is 12.350.

The firm size data in table 1, TA (M€) is extremely dispersed. The mean has a value of 7,576.399 and the standard deviation (22,925.706) is almost tripled compared to the mean. The range, form minimum to maximum, is also very large as it ranges from 4.850 to 243,417.235. When looking at the leverage (calculated as Debt-to-Equity), we find a mean of 1.658. Which tells us that companies in the sample are on average more financed by debt than by equity, since the D/E > 1.000. Similarly, the median has a value of 1.109 and tells us that more than 50% of the sample has a leverage above 1 and thus is financed mostly by debt and not by equity. Surprisingly, the minimum value tells us that there is a company that is mostly finance by equity.

Table 1: Descriptive statistics before Log-translation, over the Benelux.

%Female is the percentage of female on boards, calculated as the number of females on board divided by the total number of board members. DFemale is a dummy variable for a female being present on a board, it has the value 1 if there is at least one female present in a boardroom, and 0 otherwise (Campbell & Mínguez-Vera, 2008). Tobin's Q is calculated by the sum of market value of equity plus the book value of the total debt, which is divided by the total book value of all company assets (Brahma et al., 2021). ROA is the Return-on-Assets of a company and is calculated by dividing the net income by average total assets. TA is the book-value of total assets in Millions of Euro's. Leverage is calculated as the ratio of total debt divided by total equity. Firm Age is calculated as the age of the firm in the corresponding year of the panel data set, minus the year of incorporation.

Variable	Number of Observations	Median	Mean	Std. Deviation	Minimum	Maximum
%Female	1,410	0.185	0.190	0.106	0.000	0.571
Dfemale	1,410	1.000	0.930	0.256	0.000	1.000
Tobin's Q	1,410	0.708	1.047	1.150	0.004	12.350
ROA	1,410	0.041	0.041	0.088	-0.822	0.646
Total Assets (M€)	1,410	1,150.530	7,576.399	22,925.706	4.850	243,417.235
Leverage	1,410	1.110	1.606	2.215	0.003	39.750
Firm Age	1,410	32.000	53.557	64.910	1.000	562.000

Table 2: Descriptive statistics before required Log-transformations for Belgium.

The variables are the same as in Table 1.

Variable	Number of Observations	Median	Mean	Std. Deviation	Minimum	Maximum
%Female	700	0.207	0.210	0.103	0.000	0.571
Dfemale	700	1.000	0.937	0.243	0.000	1.000
Tobin's Q	700	0.647	0.941	1.045	0.058	9.181
ROA	700	0.038	0.048	0.065	-0.267	0.646
Total Assets (M€)	700	733.610	4,867.207	22,812.651	4.850	243,417.235
Leverage	700	1.053	1.363	1.369	0.012	16.646
Firm Age	700	38.000	62.914	79.498	1.000	562.000

Table 3: Descriptive statistics before required Log-transformations for Luxembourg.

The variables are the same as in Table 1.

Variable	Number of Observations	Median	Mean	Std. Deviation	Minimum	Maximum

%Female	210	0.185	0.209	0.119	0.000	0.478
Dfemale	210	1.000	0.933	0.250	0.000	1.000
Tobin's Q	210	0.568	0.838	1.014	0.004	6.671
ROA	210	0.050	0.049	0.082	-0.464	0.449
Total Assets (M€)	210	3,958.873	8,333.524	16,296.636	18.948	88,643.395
Leverage	210	0.990	1.467	2.357	0.194	18.533
Firm Age	210	15.000	19.548	14.163	3.000	62.000

Table 4: Descriptive statistics before required Log-transformations for the Netherlands.

The variables are the same as in Table 1.

Variable	Number of Observations	Median	Mean	Std. Deviation	Minimum	Maximum
%Female	500	0.147	0.156	0.095	0.000	0.500
Dfemale	500	1.000	0.918	0.275	0.000	1.000
Tobin's Q	500	0.954	1.285	1.299	0.091	12.350
ROA	500	0.043	0.028	0.115	-0.822	0.483
Total Assets (M€)	500	1,853.554	11,051.106	24,923.961	7.443	202,128.000
Leverage	500	1.264	2.005	2.942	0.003	39.750
Firm Age	500	34.000	54.740	48.466	2.000	187.000

For the individual countries, we can see that the number of observations is higher for Belgian firms. Meaning that for the Belgian firms, the sample contained more complete variables. We can see that the sample contains 70 Belgian, 21 Luxembourgian and 50 Dutch companies, with data for each of the 10 years of interest. Next, we can see that Tobin's Q has the highest value for a Dutch company, and overall the Netherlands has the highest Tobin's Q on average. Meaning that Dutch companies are higher valued on average, compared to Belgian and Luxembourgian companies. However, the ROA for Dutch firms is 2% lower on average, compared to Belgium and Luxembourg. The ROA, in combination with the Total Assets, suggests that Luxembourgian firms generate the highest returns on average, since ROA is based on the Total Assets of a firm.

The leverage tells us that on average, Dutch firms are most financed by debt, as their leverage has the highest result. Leverage is calculated as the total debt of a company, divided by its total shareholders' equity. A leverage of 2.005 indicates that the firms debt is 2.005 times larger than the firms equity. Although this is not good or bad, it does however suggest that Dutch firms tend to finance their operations more from debt than from equity. It also indicates that Dutch companies are possibly willing to take more risk, as taking on debt can be risky.

Table 5: Descriptive Statistics after required Log-transformations, over the Benelux.

%Female is the percentage of female on boards, calculated as the number of females on board divided by the total number of board members. DFemale is a dummy variable for a female being present on a board, it has the value 1 if there is at least one female present in a boardroom, and 0 otherwise (Campbell & Mínguez-Vera, 2008). TOBQ is the Log-transformation of Tobin's Q, which is calculated by the sum of market value of equity plus the book value of the total debt, which is divided by the total book value of all company assets (Brahma et al., 2021). ROA is the Return-on-Assets of a company and is calculated by dividing the net income by average total assets. FSIZE is the Log-transformation of the book-value of total assets in Millions of Euro's. LEV is the Log-transformation of the leverage of a firm and is calculated as the ratio of total debt divided by total equity. FAGE is the log-transformation of Firm Age, calculated as the age of the firm in the corresponding year of the panel data set, minus the year of incorporation.

Variable	Number of Observations	Median	Mean	Std. Deviation	Minimum	Maximum
%Female	1,410	0.185	0.190	0.106	0.000	0.571
Dfemale	1,410	1.000	0.930	0.256	0.000	1.000
TOBQ	1,410	-0.150	-0.147	0.386	-2.398	1.092
ROA	1,410	0.041	0.041	0.088	-0.822	0.646
FSIZE	1,410	3.061	3.060	0.894	0.686	5.386
LEV	1,410	0.045	0.031	0.389	-2.472	1.599
FAGE	1,410	1.505	1.527	0.422	0.000	2.750

Table 6: Descriptive Statistics after required Log-transformations for Belgium.

The variables are the same as in Table 5.

Variable	Number of Observations	Median	Mean	Std. Deviation	Minimum	Maximum
%Female	700	0.207	0.210	0.103	0.000	0.571
Dfemale	700	1.000	0.937	0.243	0.000	1.000

TOBQ	700	-0.189	-0.173	0.339	-1.237	0.963
ROA	700	0.038	0.048	0.065	-0.267	0.646
FSIZE	700	2.865	2.844	0.815	-1.906	1.221
LEV	700	0.023	-0.008	0.372	-1.906	1.221
FAGE	700	1.580	1.616	0.389	0.000	2.750

Table 7: Descriptive Statistics after required Log-transformations for Luxembourg.

The variables are the same as in Table 5.

Variable	Number of Observations	Median	Mean	Std. Deviation	Minimum	Maximum
%Female	210	0.185	0.209	0.119	0.000	0.478
Dfemale	210	1.000	0.933	0.250	0.000	1.000
TOBQ	210	-0.246	-0.284	0.478	-2.398	0.824
ROA	210	0.050	0.049	0.082	-0.464	0.449
FSIZE	210	3.598	3.375	0.789	1.278	4.948
LEV	210	-0.004	-0.012	0.338	-0.713	1.268
FAGE	210	1.176	1.192	0.294	0.477	1.792

Table 8: Descriptive Statistics after required Log-transformations for the Netherlands.

The variables are the same as in Table 5.

Variable	Number of Observations	Median	Mean	Std. Deviation	Minimum	Maximum
%Female	500	0.147	0.156	0.095	0.000	0.500
Dfemale	500	1.000	0.918	0.275	0.000	1.000
TOBQ	500	-0.020	-0.053	0.381	-1.041	1.092
ROA	500	0.043	0.028	0.115	-0.822	0.483
FSIZE	500	3.268	3.231	0.964	0.872	5.306
LEV	500	0.102	0.104	0.421	-2.472	1.599
FAGE	500	1.531	1.542	0.442	0.301	2.272

In the multi-country study of Terjesen et al. (2016), they have reported in 2010 that on average, 8.9% of board members were female, which is 6.8% lower than our starting year (based on

the Benelux). They also reported that their sample had a log of Tobin's Q of 0.34 and a log of ROA of 0.05. This shows that the sample in this study, has lower log of Tobin's Q, but a higher ROA (see Table 5). Similarly, Naghavi et al. (2021) found a Tobin's Q of 1.64, and a board gender diversity of 14.4% in their sample, containing 46 counties which include the Netherlands, Belgium and Luxembourg. Since Naghavi et al. (2021) has not used the log of Tobin's Q, we can see that the difference between Tobin's Q is about 0.6 with the sample of this study (see table 1).

For 2013, Christiansen et al. (2016) reported that about 11.5% of board members are female in the Netherlands, 25.3% are female in Belgium and 16.0% are female in Luxembourg. The percentage of Belgian female representation is remarkably high, as the sample in the study of Christiansen et al. (2016) has a Belgian percentage of 25.3% for 2013. Indicating a drop in female representation of about 7.3% in Belgium, over a year time, compared to the starting percentage of 18% for Belgium in figure 4.

The study of Zhang (2020) shows a female representation over 2007-2014, which is comparable with Table 2 and 4. Zhang (2020) has reported an average of 11% female directors on boards in Belgium and 13% female directors on board in the Netherlands. Luxembourg was excluded in the study of Zhang (2020). Additionally, Zhang (2020) reported a ROA of 5.2% and a log-transformed Tobin's Q of 0.28, on average. Both values are higher in the study of Zhang (2020), compared to the sample in the study in this thesis (see Table 5). However, in the sample of the study in this thesis, the Netherlands and Belgium both have a higher percentage of female representation. This indicates that over time, female representation has increased in the Netherlands and Belgium.

Soare et al. (2022) reported an average female representation of 17%, for 2010 to 2017. The mean of Soare et al. (2022) is lower than the mean found for Belgium in this study, but when

comparing it with Figure 4, it fits perfectly with the increase of female representation over time in Belgium that is found in this thesis.

In the sample of Ciavarella (2017) an average of 15% was reported as the average female representation in board rooms, over the timespan of 2006 to 2016. Although the sample only contains companies in France, Germany, Italy, Spain and the United Kingdom, it does offer international comparison, as Ciavarella has reported 15% female representation on average. This indicates that the sample of Ciavarella has 4% less female representation, compared to the sample for this study (see table 5). Additionally, the standard deviation of the sample of Ciavarella (2017) is 0.12, which is comparable to the variation in this study's sample. The corresponding ROA and Tobin's Q for the sample are 4.9% and -1.21, respectively.

By comparing the statistics of the sample used in this thesis, we find that in prior research the female representation in boardrooms was lower on average. This indicates that over time the female representation in boards has increased, as expected. The only exception is the study of Christiansen et al. (2016), as they have reported a significantly higher female representation in Belgian boardrooms. Overall, the descriptive statistics show the characteristics, and provides insight into the distribution of the dataset.

4.2.2 Correlation Analysis

Table 9 shows the correlation between the variables of interest for this study. When looking at the highest value, we find 0.518*** for %Female and DFemale, which makes perfectly sense because DFemale is a dummy variable for %Female. . The lowest relationship in the correlation matrix is between TOBQ and LEV. This can be interpret that these two variables are negatively related to each other.

Table 9 also shows the relationship between %Female and other variables of interest. It suggests that only LEV is negatively related to %Female, meaning that an increase

in %Female would mean a decrease in LEV. As mentioned in chapter 2 Literature Review, women tend to be more risk averse (Bernile et al., 2018), the negative relation in the correlation matrix between %Female and LEV tends to confirm this. Next to this negative relation, %Female only has positive relations in table 9. Suggesting that %Female has positive effects on the rest of variables.

Table 9: Correlation Matrix

Variable		%Female	Dfemale	TOBQ	ROA	FSIZE	LEV	FAGE
1. %Female	Pearson's r	––						
2. Dfemale	Pearson's r	0.496***	––					
3. TOBQ	Pearson's r	0.042	0.046	––				
4. ROA	Pearson's r	0.108***	0.005	0.193***	––			
5. FSIZE	Pearson's r	0.182***	0.222***	−0.122***	−0.066*	––		
6. LEV	Pearson's r	−0.074**	0.070**	−0.336***	−0.129***	0.321***	––	
7. FAGE	Pearson's r	0.041	0.052*	0.001	0.144***	0.011	0.001	––

$*\ p < .05, \quad **\ p < .01, \quad ***\ p < .001$

There is one correlation that I want to emphasize. The correlation matrix indicates no statistically significant relationship between TOBQ and %Female, suggesting there is no evidence of an association between female representation in boardrooms and firm value, as measured by Tobin's Q.

Multicollinearity could be a problem in the dataset, which would be present if there is a strong correlation between 2 or more independent variables. But, there are no correlational values above 0.800 or below -0.800, meaning that there is no indication of multicollinearity. However, in order to be absolutely sure, in the regression analysis in the next section, a 'Variance Inflation Factor' (VIF) will be added to the output of the regression analysis. If there is no strong correlation between the independent variables, the VIF is equal to 1. VIF values above 10 will indicate multicollinearity and are serious reason for concern. When

multicollinearity is detected by VIF, it will be reported and otherwise VIF will be not be reported.

4.2.3 Regression Analysis

4.2.3.1 Regression Analysis for H1.

For H1:

> **Board gender diversity will positively influence the financial performance of Dutch publicly listed firms.**

Our standard regression analysis is required to test if H1 should be accepted or rejected, based on the multiple control and dummy variables. The results are reported in Table 10.

The values for R^2 state how well the model fits. A higher value for R^2 indicates a better model fit. It states the proportion of variance in the dependent variable that is explained by the independent variables in the model. From the R^2 it can be concluded that columns (4) have the best model fit for Tobin's Q and ROA (0.199 and 0.096, respectively), regarding the representation of female directors on boards. For the robustness check, regarding the influence of at least one female director being present on Tobin's Q and ROA, columns (8) have the best model fit (0.198 and 0.093, respectively). The Adjusted R^2 indicates

First the results for Tobin's Q will be discussed. In column (1) and (5), we find that the coefficient of %Female (0.177) and DFemale (0.071) are positive, but statistically insignificant, which suggest that there is no statistical evidence that female representation influences Tobin's Q. In column (2), it can be seen that %Female has no positive statistically significant coefficient (0.103) with Tobin's Q, but in column (6) it shows that DFemale does has a positive statistically significant coefficient (0.118**) with Tobin's Q at the 1% level of significance.

Table 10: Regression results for the effect of board gender diversity on Tobin's Q and ROA, for H1.

This table presents the results of multiple linear regressions, estimating the relationship between female representation on boards (%Female) and firm performance, measured by Tobin's Q and ROA. DFemale checks for robustness of the results, by validating if the effect of gender diversity on firm performance holds when measured by using a binary dummy variable instead of a continuous percentage of %Female. Each column represents a different regression model specification. Columns (1) and (5) show a basic regression analysis, which includes the main independent variable (%Female or DFemale, respectively). Columns (2) and (6) include control variables (FSIZE, LEV and FAGE), to account for firm characteristics. Columns (3) and (7) include controls for country and industry by adding country dummies and the MaleDom binary variable. Column (4) and (8) present the full regression specification. All specifications include year dummies.

Independent variable	Dependent Variable															
	TOBQ								ROA							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%Female	0.177	0.103	0.363***	0.367***					0.084***	0.059**	0.069**	0.049*				
Dfemale					0.071	0.118**	0.083*	0.137***					−0.001	−0.007	−0.005	−0.010
FSIZE		−0.008		−0.023		−0.013		−0.020		0.010***		0.006*		0.012***		0.009**
LEV		−0.328***		−0.359***		−0.322***		−0.370***		−0.035***		−0.036***		−0.037***		−0.038***
FAGE		0.004		−0.038		0.001		−0.040		0.029***		0.032***		0.030***		0.032***
Country(LU)			−0.111***	−0.166***			−0.111***	−0.118***			0.001	0.011			0.001	0.010
Country(NL)			0.142***	0.179***			0.125***	0.163***			−0.020***	−0.017**			−0.023***	−0.020***
MaleDom			−0.018	0.046*			−0.023	0.039*			0.026***	0.027***			0.026***	0.027***
Observations	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410
R^2	0.012	0.125	0.061	0.199	0.012	0.130	0.055	0.198	0.024	0.066	0.053	0.096	0.015	0.061	0.047	0.093
Adjusted R^2	0.005	0.117	0.052	0.190	0.004	0.122	0.046	0.189	0.017	0.057	0.044	0.085	0.008	0.053	0.038	0.083

$*\ p < .05,\ **\ p < .01,\ ***\ p < .001$

Indicating that the percentage of female representation does not significantly influences Tobin's Q, but the presence of at least one female director does, for this regression model. Furthermore, column (2) and (6) both indicate that firms leverage has a negative statistically significant coefficient (-0.328*** and -0.322***, respectively) with Tobin's Q, both at the 0.1% significance level. This indicates that a higher leverage tends to lead to a lower Tobin's Q. Columns (2) and (6) show no statistical significant coefficients for Firm Size or Firm Age, indicating that there is no statistical evidence that these independent variables tend to lead to a higher or lower Tobin's Q, in this regression model. Columns (3) and (7) both indicate female representation has a positive statistically significant coefficient (0.363*** and 0.083*, respectively) with Tobin's Q. Although, the positive coefficient in column (3) has a higher level of significance, 0.1% compared to 5% in column (7). Additionally, both columns (3) and (7) indicate a negative coefficient for Luxembourg (both -0.111***) and a positive coefficient for the Netherlands (0.142*** and 0.125***, respectively), all at the 0.1% level of significance. This suggest that Dutch firms tend to have a higher Tobin's Q, and Luxembourgian firms tend to have a lower Tobin's Q, compared to baseline country Belgium. Both column (3) and (7) indicate that there is no statistical evidence that male dominated sectors tend to lead to a higher or lower Tobin's Q. Column (4) and (8) both indicate a positive statistically significant coefficient for %Female (0.367***) and DFemale (0.137***) with Tobin's Q. Next to this, column (4) and (8) both indicate that firms leverage has a negative statistically significant coefficient (-0.359*** and -0.370***, respectively) with Tobin's Q, both at the 0.1% significance level. Columns (4) and (8) indicate a negative coefficient for Luxembourg (-0.166*** and -0.118***, respectively) and a positive coefficient for the Netherlands (0.142*** and 0.163***, respectively), all at the 0.1% level of significance. This suggest that Dutch firms tend to have a higher Tobin's Q, and Luxembourgian firms tend to have a lower Tobin's Q, compared to baseline country Belgium. Columns (4) and (8) now show a positive statistically significant coefficient, both at the 5% level of significance, for MaleDom (0.046* and 0.039*,

respectively). This suggests that Tobin's Q tends to be higher in male-dominated sectors. Both column (4) and (8) indicate that there is no statistical evidence that Firm Size or Firm Age tends to influence Tobin's Q.

As reported earlier, columns (4) and (8) have the best model fit for H1, as these columns have the highest R^2, therefore these columns will be used to draw the conclusion for H1 in chapter 5.

Lastly, regarding multicollinearity, none of the regression specifications showed a Variance Inflation Factor (VIF) above 2.000, indicating that multicollinearity is not a concern in these sets of regressions analyses.

Next, there are the results for the different regression specifications with regards to ROA. In column (1) and (5), we find the coefficient of %Female (0.084***) and DFemale (-0.001), respectively. Only for %Female the coefficient is statistically significant, at the 0.1% level, which suggest that there is statistical evidence that %Female representation influences ROA, but there is no statistical significant evidence that DFemale tends to influence ROA. In column (2), it can be seen that %Female has a positive statistically significant coefficient (0.059**) with ROA, at a significance level of 1%, but in column (6) it shows that DFemale does not have a statistically significant coefficient (-0.007) with ROA. Indicating that the percentage of female representation significantly influences ROA, but the presence of at least one female director does not, for this regression model. Furthermore, column (2) and (6) both indicate that firms leverage has a negative statistically significant coefficient (-0.035*** and -0.037***, respectively) with ROA, both at the 0.1% significance level. This indicates that a higher leverage tends to lead to a lower ROA. Column (2) and (6) also indicate that a larger Firm Size (0.010*** and 0.012***, respectively) and a larger Firm Age (0.029*** and 0.030***, respectively) both tend lead to a higher ROA. Columns (3) and (7) show a

statistically significant coefficient for %Female (0.069**), but no statistically significant coefficient for DFemale (-0.005). Suggesting that there is statistical evidence that a higher representation of female directors tends to lead to a higher ROA, but there is no statistical evidence that the presence of at least one female director leads to a decrease of ROA. Additionally, both columns (3) and (7) indicate a positive statistically insignificant coefficient for Luxembourg (both 0.001) and a negative coefficient for the Netherlands (-0.020*** and 0.023***, respectively) at the 0.1% level of significance. This suggest that Dutch firms tend to have a lower ROA, compared to baseline country Belgium. While for Luxembourg no statistical evidence is present, that firms in Luxembourg have a higher or lower ROA, compared to Belgian firms. Also, column (3) and (7) indicate that male dominated sectors have a statistical significant coefficient (0.026*** and 0.026***, respectively), indicating that a male dominated sectors tend to lead to a higher ROA. Column (4) indicates a positive statistically significant coefficient for %Female (0.049*), while column (8) shows a negative statistically insignificant coefficient for DFemale (-0.010) with ROA. Suggesting that a higher female representation in boardrooms tends to lead to a higher ROA, while there is no statistical evidence that the presence of at least one female director tends to lead to a higher or lower ROA. Next to this, column (4) and (8) both indicate that firm leverage has a negative statistically significant coefficient (-0.036*** and -0.038***, respectively) with ROA, both at the 0.1% significance level. Columns (4) and (8) also show positive statistical significant coefficients for Firm Size (0.006* and 0.009**, respectively) and Firm Age (both 0.032***). This indicates that both a higher Firm Size and a higher Firm Age tend to lead to a higher ROA. Columns (4) and (8) indicate a positive statistically insignificant coefficient for Luxembourg (0.011 and 0.010, respectively) and a negative statistically significant coefficient for the Netherlands (-0.017*** and -0.020***, respectively), at the 0.1% level of significance. This suggest that Dutch firms tend to have a lower ROA, compared to baseline country Belgium. But for Luxembourgian firms, no statistical evidence is present that indicates that firms in

Luxembourg tend to have a higher ROA, compared to Belgium. Lastly, columns (4) and (8) show a positive statistically significant coefficient, both at the 0.1% level of significance, for MaleDom (both 0.027***). This suggests that Tobin's Q tends to be higher in male-dominated sectors.

As reported earlier, columns (4) and (8) have the best model fit for H1, as these columns have the highest R^2, therefore these columns will be used to draw the conclusion for H1 in chapter 5. Regarding the deviation between R^2 and Adjusted R^2, the deviation between both variables is between 0.007 and 0.011, which is well within acceptable limits, and therefore suggest that the model does not contain excessive irrelevant predictors. Indicating that the variables included in the models contribute meaningful to the explanation of the variation in the dependent variable.

Regarding multicollinearity, none of the regression specifications showed a Variance Inflation Factor (VIF) above 2.000, indicating that multicollinearity is not a concern in these sets of regressions analyses.

4.2.3.2 Regression Analysis for H2

For H2:

> **The positive effect of board gender diversity on financial performance is stronger in larger firms.**

The results of various regression specifications, for hypothesis 2, can be found in Table 11. When adding the interaction terms, first thing that is noticed is the slight increase in the VIF for %Female, FSize, DFemale, DFemale * FSIZE and %Female * FSIZE. But since VIF stays below 5.000, there is no indication of multicollinearity in these regression analyses.

The values for R^2 state how well the model fits. A higher value for R^2 indicates a better model fit. It states the proportion of variance in the dependent variable that is explained by the independent variables in the model. From the R^2 it can be concluded that columns (4) have the best model fit for Tobin's Q and ROA, regarding the representation of female directors on boards. For the robustness check, regarding the influence of at least one female director being present on ROA and Tobin's Q, columns (8) have the best model fit.

In order to test hypothesis 2, the focus will change to the interaction terms. %Female * FSIZE indicates how the effect of female representation in boardrooms on the dependent variable changes with firm size. It examines if a higher percentage of female directors has a stronger or weaker effect in larger firms. Similarly, DFemale * FSIZE indicates how the presence of at least one female director affects the dependent variable as firm size increases. Since we already assessed all individual variables for hypothesis 1, only the interaction terms will be discussed. By including the interaction terms, the interpretation of FSIZE, %Female and DFemale changed. The coefficients for these variables now indicate the effect when the other interacting variable is equal to zero (FSIZE = 0, or %Female/DFemale = 0).

First, we will assess the results of the coefficient for %Female * FSIZE. Column (1) shows a positive statistically insignificant coefficient (0.181) for the interaction term %Female * FSIZE, suggesting that there is no statistically significant evidence that a higher representation of females on boards in larger firms, tends to lead to a higher Tobin's Q. %Female * FSIZE shows statistically significant positive coefficients in column (2), (3) and (4), with values of 0.311**, 0.223*, and 0,381*** respectively, which are statistically significant at levels of 1%, 5% and 0.1%, respectively. For %Female * FSIZE, no statistically significant effect can be found on ROA, indicating that there is no evidence in the sample that a higher female representation on boards in larger firms significantly influences ROA. This implies that in none of the

Table 11: Regression results for the effect of board gender diversity on Tobin's Q and ROA, for H2.

*This table presents the results of multiple linear regressions, estimating the relationship between female representation on boards (%Female) and firm performance, measured by Tobin's Q and ROA. DFemale checks for robustness of the results, by validating if the effect of gender diversity on firm performance holds when measured by using a binary dummy variable instead of a continuous percentage of %Female. Each column represents a different regression model specification. Columns (1) and (5) show a basic regression analysis, which includes the main independent variable (%Female or DFemale, respectively), FSIZE, and the interaction terms (%Female * FSIZE and DFemale * FSIZE). Columns (2) and (6) include control variables (LEV and FAGE), to account for firm characteristics. Columns (3) and (7) include controls for country and industry by adding country dummies and the MaleDom binary variable. Column (4) and (8) present the full regression specification. All specifications include year dummies.*

Independent variable	Dependent Variable															
	TOBQ								ROA							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%Female	−0.289	−0.842**	−0.163	−0.785*					0.212**	0.150	0.170*	0.105				
Dfemale					0.080	0.064	0.084	0.062					−0.004	−0.004	−0.004	−0.001
FSIZE	−0.088***	−0.059**	−0.133***	−0.087***	−0.073*	−0.033	−0.087*	−0.048	0.012*	0.015**	0.008	0.009	0.007	0.013	0.006	0.012
LEV		−0.336***		−0.370***		−0.332***		−0.371***		−0.034***		−0.036***		−0.037***		−0.038***
FAGE		0.004		−0.038		−0.001		−0.041		0.029***		0.032***		0.030***		0.032***
Country(LU)			−0.070*	−0.116***			−0.074*	−0.118***			0.000	0.011			−0.001	0.010
Country(NL)			0.174***	0.181***			0.148***	0.163***			−0.021***	−0.017***			−0.025***	−0.020
MaleDom			0.024	0.055**			0.009	0.039*			0.025***	0.027***			0.024***	0.027***
%Female * FSIZE	0.181	0.311**	0.223*	0.381***					−0.044	−0.030	−0.035	−0.019				
DFemale * FSIZE					0.015	0.023	0.020	0.031					0.000	−0.001	−0.002	−0.003
Observations	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410
R^2	0.031	0.131	0.088	0.207	0.030	0.130	0.076	0.199	0.028	0.067	0.055	0.096	0.018	0.061	0.049	0.093
Adjusted R^2	0.022	0.122	0.078	0.198	0.021	0.121	0.066	0.189	0.020	0.057	0.044	0.085	0.010	0.052	0.039	0.082

$* p < .05,\ ** p < .01,\ *** p < .001$

regression specifications, there is statistically significant evidence that a higher female representation in boards of larger firms, tends to lead to a higher ROA.

Second, the interaction term of DFemale * FSIZE will be assessed. For DFemale * FSIZE, there is no statistically significant effect found on ROA, or Tobin's Q. Columns (5) to (8), all show a statistically insignificant effect of at least one female director being present interacting with firm size, indicating that this interaction does not significantly influences Tobin's Q or ROA.

As reported earlier, columns (4) and (8) have the best model fit for H2, as these columns have the highest R^2, therefore these columns will be used to draw the conclusion for H2 in chapter 5. Regarding the deviation between R^2 and Adjusted R^2, the deviation between both variables is between 0.007 and 0.011, which is well within acceptable limits, and therefore suggest that the model does not contain excessive irrelevant predictors. Indicating that the variables included in the models contribute meaningful to the explanation of the variation in the dependent variable.

4.2.3.3 Regression Analysis for H3

For H3:

> **The impact of board gender diversity on financial performance is stronger in male-dominated industries.**

The results of various regression specifications, for hypothesis 3, can be found in Table 12. When adding the interaction terms, first thing that is noticed is the slight increase in the VIF for %Female, Maledom, DFemale, DFemale * Maledom and %Female * Maledom. But since VIF stays below 5.000, there is no indication of multicollinearity in these regression analyses.

The values for R^2 state how well the model fits. A higher value for R^2 indicates a better model fit. It states the proportion of variance in the dependent variable that is explained by the

independent variables in the model. From the R^2 it can be concluded that columns (4) have the best model fit for Tobin's Q and ROA, regarding the representation of female directors on boards. For the robustness check, regarding the influence of at least one female director being present on ROA and Tobin's Q, columns (8) have the best model fit.

%Female * MaleDom indicates how the effect of female board representation on the dependent variable changes in a male dominated sector. It examines if a higher percentage of female directors has a stronger or weaker effect in male dominated sectors. Similarly, DFemale * MaleDom indicates how the presence of at least one female director affects the dependent variable when the sector is male dominated. Since we already assessed all individual variables for hypothesis 1, only the interaction terms will be discussed. By including the interaction terms, the interpretation of MaleDom, %Female and DFemale changed. The coefficients for these variables now indicate the effect when the other interacting variable is equal to zero (MaleDom = 0, or %Female/DFemale = 0).

First, the coefficients for %Female * MaleDom will be assessed. In columns (1) to (4) in the regression analysis for Tobin's Q, all coefficients are positive and statistically significant at the 0.1% level. Indicating that in male dominated sectors, %Female representation on boards strongly positively influences Tobin's Q. In other words, female representation on boards influences Tobin's Q more positively, when the firm operates in a male dominated sector. For ROA, there is no statistically significant evidence that the interaction between female representation on boards and male dominated sectors, affect a firms ROA.

For DFemale * MaleDom, the presence of at least on female director on a firms board, in male dominated sectors, statistically significant influences Tobin's Q. Columns (5) to (8) all show a positive affect at a significance level of 5% for all four regression specifications. For ROA, DFemale * MaleDom has no statistically significant relationship between the presence

Table 12: Regression results for the effect of board gender diversity on Tobin's Q and ROA, for H3.

*This table presents the results of multiple linear regressions, estimating the relationship between female representation on boards (%Female) and firm performance, measured by Tobin's Q and ROA. DFemale checks for robustness of the results, by validating if the effect of gender diversity on firm performance holds when measured by using a binary dummy variable instead of a continuous percentage of %Female. Each column represents a different regression model specification. Columns (1) and (5) show a basic regression analysis, which includes the main independent variable (%Female or DFemale, respectively), MaleDom, and the interaction terms (%Female * MaleDom and DFemale * MaleDom). Columns (2) and (6) include control variables (FSIZE, LEV and FAGE), to account for firm characteristics. Columns (3) and (7) include controls for country by adding country dummies. Column (4) and (8) present the full regression specification. All specifications include year dummies.*

Independent variable	Dependent Variable															
	TOBQ								ROA							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%Female	−0.332**	−0.376**	−0.137	−0.139					0.068*	0.052	0.047	0.029				
Dfemale					0.006	0.056	0.017	0.072					−0.011	−0.012	−0.014	−0.015
FSIZE		−0.006		−0.011		−0.021		−0.019		0.006*		0.007*		0.008**		0.009**
LEV		−0.342***		−0.364***		−0.341***		−0.370***		−0.039***		−0.036***		−0.041***		−0.038***
FAGE		−0.014		−0.051*		−0.006		−0.046		0.027***		0.031***		0.028***		0.031***
MaleDom	−0.257***	−0.190***	−0.275***	−0.207***		−0.116	−0.216**	−0.148	0.012	0.016	0.015	0.017	0.001	0.009	0.002	0.011
Country (LU)			−0.097***	−0.114***			−0.0116***	−0.127***			0.002	0.011			0.001	0.009
Country (NL)			0.147***	0.178***			0.121***	0.158***			−0.019***	−0.017**			−0.024***	−0.021***
%Female * MaleDom	1.385***	1.332***	1.364***	1.320***					0.062	0.051	0.060	0.052				
DFemale * MaleDom					0.202*	0.190*	0.205*	0.199*					0.023	0.017	0.026	0.017
Observations	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410
R^2	0.045	0.161	0.093	0.229	0.015	0.139	0.059	0.202	0.043	0.085	0.054	0.096	0.032	0.078	0.048	0.094
Adjusted R^2	0.037	0.152	0.084	0.219	0.007	0.130	0.049	0.192	0.035	0.075	0.044	0.085	0.024	0.068	0.039	0.083

$*\ p < .05, \quad **\ p < .01, \quad ***\ p < .001$

of at least one female director and ROA, in male dominated industries, since columns (5) to (8) all show a statistically insignificant relationship.

The results imply that female representation on boards, in percentage and for one female director being present, has a positive effect on Tobin's Q in male dominated sectors.

However, no significant evidence was found that ROA is affected by the presence of female directors, in percentage or at least one being present, in male dominated sectors.

As reported earlier, columns (4) and (8) have the best model fit for H3, as these columns have the highest R^2, therefore these columns will be used to draw the conclusion for H3 in chapter 5. Regarding the deviation between R^2 and Adjusted R^2, the deviation between both variables is between 0.007 and 0.011, which is well within acceptable limits, and therefore suggest that the model does not contain excessive irrelevant predictors. Indicating that the variables included in the models contribute meaningful to the explanation of the variation in the dependent variable.

4.2.3.4 Regression Analysis for H4

For H4:

> **The impact of board gender diversity on financial performance is stronger in the Netherlands.**

The results of various regression specifications, for hypothesis 4, can be found in Table 13. When adding the interaction terms, first thing that is noticed is the slight increase in the VIF for %Female, DFemale, Country(NL), Country(LU), DFemale * Country(NL) and %Female * Country(LU). But since VIF stays below 5.000, there is no indication of multicollinearity in these regression analyses.

The values for R^2 state how well the model fits. A higher value for R^2 indicates a better model fit. It states the proportion of variance in the dependent variable that is explained by the independent variables in the model. From the R^2 it can be concluded that columns (4) have the best model fit for Tobin's Q and ROA, regarding the representation of female directors on boards. For the robustness check, regarding the influence of at least one female director being present on ROA and Tobin's Q, columns (8) have the best model fit.

The interaction term %Female * Country(LU) indicates how the effect of female board representation on the dependent variable changes for firms located in Luxembourg. It examines if a higher percentage of female directors has a stronger or weaker effect on firm performance in Luxembourg, compared to Belgium. Similarly, DFemale * Country(LU) indicates how the presence of at least one female director affects the dependent variable when the firm operates in Luxembourg, compared to Belgium. The same rationale holds for %Female * Country(NL) and DFemale * Country(NL). Since the effects of %Female, DFemale and the country dummies were already assessed for hypothesis 1, only the interaction terms will be discussed. By including the interaction terms, the interpretation of Country(LU), Country(NL), %Female and DFemale changed. The coefficients for these variables now indicate the effect only when the other interacting variable is equal to zero (Country = Belgium, or %Female/DFemale = 0).

For %Female * Country(LU), there is no statistically significant coefficient for the interaction between %Female and Country(LU) in any of the regression specifications (column (1) to (4)) for Tobin's Q or ROA. This suggests that a higher percentage of female representation has no significantly different effect on firm performance in Luxembourg compared to Belgium.

For the interaction term of %Female * Country(NL), there is a statistically significant interaction between %Female and Country(NL) in column (2) and (4) for Tobin's Q. This suggests that a higher percentage of female directors is more positively associated with

Table 13: Regression results for the effect of board gender diversity on Tobin's Q and ROA, for H4.

*This table presents the results of multiple linear regressions, estimating the relationship between female representation on boards (%Female) and firm performance, measured by Tobin's Q and ROA. DFemale checks for robustness of the results, by validating if the effect of gender diversity on firm performance holds when measured by using a binary dummy variable instead of a continuous percentage of %Female. Each column represents a different regression model specification. Columns (1) and (5) show a basic regression analysis, which includes the main independent variable (%Female or DFemale, respectively), country dummies, and the interaction terms (%Female * Country(LU) and DFemale * Country(NL). Columns (2) and (6) include control variables (FSIZE, LEV and FAGE), to account for firm characteristics. Columns (3) and (7) include controls for industry by adding MaleDom. Column (4) and (8) present the full regression specification. All specifications include year dummies.*

Independent variable	Dependent Variable															
	TOBQ								ROA							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
%Female	0.299*	0.127	0.299*	0.143					0.071*	0.023	0.072*	0.032				
Dfemale					0.106	0.181***	0.105	0.189***					0.015	−0.002	0.016	0.003
FSIZE		−0.013		−0.020		−0.015		−0.021		0.011***		0.007*		0.012***		0.008**
LEV		−0.361***		−0.367***		−0.365***		−0.370***		−0.033***		−0.037***		−0.034***		−0.038***
FAGE		−0.042		−0.043		−0.045		−0.046		0.032***		0.031***		0.032***		0.031***
MaleDom			−0.021	0.045*			−0.022	0.043*			0.026***	0.027***			0.027***	0.027***
Country (LU)	−0.076	−1.59**	−0.073	−0.161**	0.042	0.063	0.034	0.086	0.016	0.007	0.012	0.006	0.013	−0.004	0.024	0.011
Country (NL)	0.083	0.073	0.085	0.072	0.127	0.198**	0.125	0.208**	−0.020	−0.023*	−0.023*	−0.024*	0.015	0.002	0.018	0.008
%Female * Country(LU)	−0.167	0.173	−0.182	0.196					−0.068	0.009	−0.050	0.023				
%Female *Country(NL)	0.338	0.614**	0.343	0.604***					0.030	0.046	0.024	0.040				
DFemale * Country(LU)					−0.164	−0.199	−0.155	−0.221*					−0.012	0.013	−0.024	−0.001
DFemale * Country(NL)					−0.006	−0.034	−0.001	−0.019					−0.037	−0.022	−0.045*	−0.031
Observations	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410	1,410
R^2	0.063	0.201	0.063	0.204	0.055	0.198	0.056	0.200	0.033	0.075	0.054	0.096	0.028	0.075	0.051	0.095
Adjusted R^2	0.053	0.191	0.053	0.193	0.046	0.188	0.046	0.19	0.023	0.064	0.044	0.084	0.019	0.064	0.040	0.084

$*\ p < .05, \quad **\ p < .01, \quad ***\ p < .001$

Tobin's Q in the Netherlands, compared to Belgium. Columns (1) and (3) show no statistically significant interaction effect between %Female and Country(NL), indicating that in those regression specifications there was no statistical evidence present. For columns (1) to (4) for ROA, there was no statistical significance. Meaning that the interaction term is not significant for ROA and no significant effect was found between countries.

For the interaction term DFemale * Country(LU), there is one statistically significant interaction between DFemale and Country(LU). Column (8) for Tobin's Q, shows a statistically significant interaction (-0.221*), at the 5% significance level. This suggests thatif at least one female director is present on a board, Tobin's Q tends to be lower in Luxembourg, compared to Belgium.

For DFemale * Country(LU), there is no statistically significant interaction between DFemale and Country(LU) on ROA. Columns (5) to (8) all show statistically insignificant interactions and this suggest that there is no evidence that ROA is impacted significant when at least one female director is present on boards, when compared to Belgium.

For DFemale * Country(NL), one statistically significant interaction (-0.045*) can be found in column (7) for ROA. Indicating a slightly negative interaction between the presence of at least one female director and ROA in the Netherlands. This implies that in the Netherlands, the presence of at least one female directors tends to lead to a slightly lower ROA, compared to Belgium. Columns (5), (6) and (8) for ROA, as well as columns (5) to (8) for Tobin's Q, all indicate statistically insignificant interactions between the presence of at least one female director in the Netherlands and the value of ROA, compared to Belgium.

As reported earlier, columns (4) and (8) have the best model fit for H4, as these columns have the highest R^2, therefore these columns will be used to draw the conclusion for H4 in chapter 5. Regarding the deviation between R^2 and Adjusted R^2, the deviation between both variables is between 0.007 and 0.011, which is well within acceptable limits, and therefore suggest

that the model does not contain excessive irrelevant predictors. Indicating that the variables included in the models contribute meaningful to the explanation of the variation in the dependent variable.

5 Conclusion and Discussion

This thesis examines the relation between gender diversity of boardrooms and financial performance in publicly listed companies in the Benelux and aims to provide a better understanding of gender diversity on financial performance of firms. The financial performances of companies is measured by ROA and Tobin's Q, which is in line with prior research (Campbell & Mínguez-Vera, 2008; Carter et al., 2010; Kweh et al., 2019). In order to execute and test for robustness, studies use ROA and Tobin's Q combined (Adams & Ferreira, 2009; Carter et al., 2010; Zhang, 2020). The research uses two measures of financial performance, Tobin's Q and ROA. ROA is an accounting-based financial measure and Tobin's Q is a market-based financial measure. To examine whether and how gender diversity of boards influences the financial performance of a firm, a regression analysis was conducted and a regression analysis was conducted. Based on the results of this analysis, four hypotheses are tested and either will be accepted or rejected. Subsequently, the 4 sub-research questions will be answered based on the acceptation or rejection of their corresponding hypotheses.

To answer sub-research question 1:

> **How does female board membership influence the financial performance of publicly listed companies in the Benelux?**

Hypothesis 1 will be accepted or rejected.

H0: **Board gender diversity will not influence the financial performance of Benelux, publicly listed, firms.**

H1: **Board gender diversity will positively influence the financial performance of Benelux publicly listed firms.**

A general model was developed to test Hypothesis 1. For Tobin's Q the results shows a statistically significant positive coefficient with female board representation, both when

measured as a percentage (%Female) and as a binary dummy (DFemale). This suggest that firms with a higher percentage of female representation in boardrooms, or with at least one female director being present, tend to have a higher average Tobin's Q. Since the positive relationship between Tobin's Q and female representation is statistically significant, Hypothesis 1 is supported when using Tobin's Q as a performance measurement.

For ROA the model results are mixed. While %Female shows a statistically significant positive relations ship between female representation in boardrooms, DFemale does not indicate a significant coefficient. This indicates that a higher female representation in boardrooms tends to lead to a higher ROA, the presence of at least one female director does not show a statistically significant effect.

Although both measures of gender diversity show a significant positive relationship with Tobin's Q, only %Female is significant in explaining ROA. Therefore, the results suggest that the positive impact of board gender diversity on firm performance is more supported when performance is measured using Tobin's Q, than ROA. Hence, Hypothesis 1 is partially accepted, and sub-research question 1 can be partially answered as female representation tends to lead to a higher firm performance in publicly listed companies in the Benelux.

To answer sub-research question 2:

> **Is the effect of board gender diversity on financial performance stronger in larger firms?**

Hypothesis 2 will be accepted or rejected.

H2: The positive effect of board gender diversity on financial performance is stronger in larger firms.

To assess Hypothesis 2, two interaction terms between gender diversity (%Female and DFemale) and Firm Size (FSIZE) were added. From the regression for Tobin's Q, we can

conclude that the interaction of %Female * FSIZE is positive and statistically significant, indicating that the positive significant effect of female board representation is stronger in larger firms. For the effect of at least on female director being present in the boardroom, no statistical evidence was found. This indicates that the presence of at least on female director, does no lead to a stronger positive effect on Tobin's Q, in larger firms. This suggest that female representation, when measured as %Female, has a significantly stronger effect on Tobin's Q in large companies, compared to small companies.

For ROA, both interaction terms fail to indicate a statistically significant relation in any of the regression specification. This suggest that the effect of firm size does not significantly influence the effect of female representation on ROA, for both %Female and DFemale.

Based on these results, the evidence to accept or reject H2 is mixed. Therefore, Hypothesis 2 is partially accepted and sub-research question 2 can be partially answered accordingly. Hence, the effect of board gender diversity is stronger in larger firms when firm performance is measured by Tobin's Q and female representation is measured by %Female.

To answer sub-research question 3:

Is the effect of board gender diversity on financial performance stronger in male-dominated sectors?

Hypothesis 3 will be accepted or rejected.

H3: The positive effect of board gender diversity on financial performance is stronger in male-dominated industries.

To assess Hypothesis 3, two interaction terms between gender diversity (%Female and DFemale) and male dominated sectors (MaleDom) were added. From the regression for Tobin's Q, we can conclude that the interactions of %Female * MaleDom and DFemale *

MaleDom are positive and statistically significant, indicating that the positive significant effect of female board representation is stronger in male-dominated sectors. This suggest that female representation, when measured as %Female or DFemale, both have a significantly stronger effect on Tobin's Q in male-dominated sectors, compared to female-dominated sectors, supporting Hypothesis 3 for Tobin's Q.

For ROA, both interaction terms fail to indicate a statistically significant relation in any of the regression specification. This suggest that the effect of male dominated sectors does not significantly influence the effect of female representation on ROA, for both %Female and DFemale.

Based on these results, the evidence to accept or reject H3 is mixed. Therefore, Hypothesis 3 is partially accepted and sub-research question 3 can be partially answered accordingly. Hence, the findings indicate that the positive effect of board gender diversity of firm performance is stronger in male-dominated sectors, when firm performance is measured by Tobin's Q.

To answer sub-research question 4:

> **Does the impact of board gender diversity on financial performance differ between countries in the Benelux?**

Hypothesis 4 will be accepted or rejected.

H4: The positive effect of board gender diversity on financial performance is stronger in the Netherlands.

To assess Hypothesis 4, four interaction terms between gender diversity (%Female and DFemale) and country dummies (Country(NL) and Country(LU)) were added. From the regression for Tobin's Q, we can conclude that the interactions of %Female * Country(NL) is

positive and statistically significant, indicating that the positive significant relationship between female board representation and Tobin's Q is stronger in the Netherlands, compared to Belgium. The interaction of DFemale * Country(NL) is not statistically significant, suggesting that the presence of at least one female directors has no significantly stronger effect on Tobin's Q in the Netherlands, than it has in Belgium.

For ROA, both interaction terms, %Female * Country(NL) and DFemale * Country(NL), are not statistically significant. This suggests that female board representation, measured in %Female or DFemale, does not have a significantly stronger effect on ROA in the Netherlands, compared to Belgium. Although, column (7) for ROA indicates that DFemale * Country(NL) has a negative statistically significant coefficient, column (8) has a better model fit and is therefore used to assess Hypothesis 4.

Based on these results, the evidence to accept or reject H4 is mixed. Therefore, Hypothesis 4 is partially accepted and sub-research question 4 can be partially answered accordingly. Hence, the findings indicate that the positive effect of board gender diversity on firm performance is stronger in the Netherlands, when firm performance is measured by Tobin's Q and female representation is measure by %Female.

The empirical evidence from this research helps to understand the effects of gender diversity on financial performance of firms in the Benelux. The research provides no clear answer on the effects of gender diversity on financial performance, as multiple regressions fails to provide the same acceptation or rejection of hypotheses. For Tobin's Q, hypotheses 1 and 3 were fully accepted and hypothesis 2 and 4 were partially accepted, while for ROA only hypothesis 1 was partly accepted.

Regarding the outcomes of this study, the outcomes are not clearly in line with outcomes of previous studies. Carter et al. (2010) and Shao and Liu (2014) have found a positive relationship between gender diversity in boardrooms and the financial performance of US firms. Similar results are reported by Terjesen et al. (2016), as they found that companies with a higher female representation have a higher firm performance based on Tobin's Q and ROA. The finding in this study are partly contradictory, as for Tobin's Q, hypotheses 1 and 3 were fully accepted and hypothesis 2 and 4 were partially accepted, while for ROA only hypothesis 1 was partly accepted. The results for ROA are therefore mostly in line with local previous studies (Matsa & Miller, 2013; Smith et al., 2006), as they reported negative effects of female representation on financial performance. However, the outcome of ROA in this study is contradictory to the findings of Terjesen et al. (2016), as they reported a positive effect of female representation on ROA.

In view of the social identity theory, Erhardt et al. (2003) argue that board diversity is associated with greater knowledge, creativity and innovation, meaning that gender diversity can improve competitiveness. In this study, the mixed results might suggest that female board members do not positively influence financial performance perse. Additionally the resource dependence theory suggest, that based on characteristics of women, more female board members can lead to a more comprehensive and informed consideration when making strategic choices (Perryman et al., 2016), further reducing risk-taking (Bernile et al., 2018). Further confirmed by Kim et al. (2020) and Laurens (2022), as they reported that female board members create firm value, by bringing new resources to the firm. Regarding the outcome of this study, the results show more alignment with the possible downside of heterogeneous boardrooms, as decision-making can take longer and efficiency becomes lower, and consequently more female representation does not lead to better choices (García-Sánchez et al., 2020).

In light of the differences in corporate governance structure, the results do tend to indicate that the Dutch two-tier systems lead to better financial performance compared to the one-tier system in Belgium and Luxembourg. This is particularly indicated in the partial acceptance of Hypothesis 4 for Tobin's Q, when female representation is measured as a percentage (%Female). Dănescu and Popa (2022) noted that previous research on corporate governance has shown that the efficiency and functioning of boards can be positively influenced by gender diversity. One could argue that the separation of the executive and the supervisory boards, combined with a higher female representation, contributes to a better firm performance. Arguably, the separation and female representation may lead to improved oversight and to reduced agency costs, therefore improving the competitiveness of Dutch companies, making them more attractive to the market compared to Belgian firms.

Overall the results in this study are not clearly conclusive and the effect of female representation on publicly listed firms in the Benelux should be further investigated in order to answer the main research question:

> **What is the impact of female board membership on the financial performance of publicly listed companies in the Benelux?**

It cannot be answered clearly based on the empirical evidence in this study. The result are not fully in line and show no clear positive or negative influence of female representation in boardrooms on financial performance. Although there is more empirical evidence to say that Tobin's Q is positively influenced by female representation in boardrooms, the results fail to also confirm this for ROA. In order to be able to answer the research question fully, additional research has to be conducted on this topic.

5.1 Limitations and Future Research

This study only takes company into account that are located in the Benelux, so only in the Netherlands, Belgium and Luxembourg. This indicates that the results should be treated carefully, since the sample only contained 141 companies after data cleanup. In order to solve the study's limitation and to increase the amount of Dutch, Belgian, Luxembourgian and European empirical evidence regarding female representation and the effects on financial performance, further research is needed that assesses this relationship. Additionally, to increase the sample size (>141), also unlisted companies might be of interest. Another limitation, is the fact that the Covid-19 pandemic gets ignored in this study, while it might be of interest for the relationship between female representation and financial performance. Koimisis et al. (2024) found empirical evidence that US firms led by female CEOs are not associated with greater financial performance than US firms led by male CEOs, in the Covid-19 pandemic. But, US firms have another legal system compared to Benelux firms and the pandemic effects may result in financial distress in firms that have less female representation in their boardrooms. Another limitation is that, arguably, not all independent variables were taken into account, either due to not being available or simply not being including in this study, like the age or the experience levels of the board members.

Although there is no significance found between the independent variable and the dependent variable of financial performance (measured through ROA and Tobin's Q), it is worthy of investigating this relationship. Especially since there is not a lot of European and Benelux empirical evidence available. Through the resource dependence theory, it can be argued that although, financial performance can be measured through a lot of dependent variables, that can be influenced by a lot of independent variables, there is always the possibility that this is not a simple linear relationship. But, that it would be much more beneficial for companies to place more emphasis on how firms can manage gender diversity

more productively, through inclusive governance practices that leverage strategic advantages of male and female input, and minimize inefficiencies in strategic decision-making (Dwiharti & Adhariani, 2018; Hillman et al., 2007; Hillman et al., 2009).

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Appendices

Appendix A: Software usage relevant to this thesis.

During the preparation of this work, Microsoft Word was used. In which suggestions of Word were used to structure, correct and improve the sentences in this thesis. This also includes suggestions for word-usage in sentences, interpunction and readability.

During the preparation of this work, EndNote (reference management software) was used. EndNote uses. RIS,. BibTex or. enw for importing citation details of papers found online. After importing the details, the references (in text and in the reference list) are managed, written and formatted, by EndNote.

During the preparation of this study, JASP statistical software was used. JASP is developed by Mark a Goss-Sampson. JASP has the ability to analyze data, provide statistical insight and generate plots, figures and tables based on the input.

Appendix B: Excel Power Query M-code

```
let
    Source = Excel.CurrentWorkbook(){[Name="Table1"]}[Content],
    #"Changed Type" = Table.TransformColumnTypes(Source,{{"Company name Latin alphabet", type text}, {"company count number", Int64.Type}, {"NAICS 2022, core code (4 digits)", Int64.Type}, {"BvD sectors", type
        text}, {"sector count number", Int64.Type}, {"female presence 2023", type number}, {"female presence 2022", type number}, {"female presence 2021", type number}, {"female presence 2020", type number},
        {"female presence 2019", type number}, {"female presence 2018", type number}, {"female presence 2017", type number}, {"female presence 2016", type number}, {"female presence 2015", type number}, {"female
        presence 2014", type number}, {"ROE using Net income#(lf)2023", type any}, {"ROE using Net income#(lf)2022", type any}, {"ROE using Net income#(lf)2021", type any}, {"ROE using Net income#(lf)2020", type
        any}, {"ROE using Net income#(lf)2019", type any}, {"ROE using Net income#(lf)2018", type any}, {"ROE using Net income#(lf)2017", type any}, {"ROE using Net income#(lf)2016", type any}, {"ROE using Net
        income#(lf)2015", type any}, {"ROE using Net income#(lf)2014", type any}, {"Total assets#(lf)M EUR 2023", type any}, {"Total assets#(lf)M EUR 2022", type any}, {"Total assets#(lf)M EUR 2021", type any},
        {"Total assets#(lf)M EUR 2020", type any}, {"Total assets#(lf)M EUR 2019", type any}, {"Total assets#(lf)M EUR 2018", type any}, {"Total assets#(lf)M EUR 2017", type any}, {"Total assets#(lf)M EUR 2016",
        type any}, {"Total assets#(lf)M EUR 2015", type any}, {"Total assets#(lf)M EUR 2014", type any}, {"LN(Total assets)#(lf)th EUR 2023", type any}, {"LN(Total assets)#(lf)th EUR 2022", type any}, {"LN(Total
        assets)#(lf)th EUR 2021", type any}, {"LN(Total assets)#(lf)th EUR 2020", type any}, {"LN(Total assets)#(lf)th EUR 2019", type any}, {"LN(Total assets)#(lf)th EUR 2018", type any}, {"LN(Total assets)#(lf)
        th EUR 2017", type any}, {"LN(Total assets)#(lf)th EUR 2016", type any}, {"LN(Total assets)#(lf)th EUR 2015", type any}, {"LN(Total assets)#(lf)th EUR 2014", type any}, {"Complete?", type text}}),
    #"Filtered Rows" = Table.SelectRows(#"Changed Type", each ([#"Complete?"] = "Complete")),
    #"Unpivoted Only Selected Columns" = Table.Unpivot(#"Filtered Rows", {"female presence 2023", "female presence 2022", "female presence 2021", "female presence 2020", "female presence 2019", "female presence
        2018", "female presence 2017", "female presence 2016", "female presence 2015", "female presence 2014", "ROE using Net income#(lf)2023", "ROE using Net income#(lf)2022", "ROE using Net income#(lf)2021",
        "ROE using Net income#(lf)2020", "ROE using Net income#(lf)2019", "ROE using Net income#(lf)2018", "ROE using Net income#(lf)2017", "ROE using Net income#(lf)2016", "ROE using Net income#(lf)2015", "ROE
        using Net income#(lf)2014", "Total assets#(lf)M EUR 2023", "Total assets#(lf)M EUR 2022", "Total assets#(lf)M EUR 2021", "Total assets#(lf)M EUR 2020", "Total assets#(lf)M EUR 2019", "Total assets#(lf)M
        EUR 2018", "Total assets#(lf)M EUR 2017", "Total assets#(lf)M EUR 2016", "Total assets#(lf)M EUR 2015", "Total assets#(lf)M EUR 2014", "LN(Total assets)#(lf)th EUR 2023", "LN(Total assets)#(lf)th EUR
        2022", "LN(Total assets)#(lf)th EUR 2021", "LN(Total assets)#(lf)th EUR 2020", "LN(Total assets)#(lf)th EUR 2019", "LN(Total assets)#(lf)th EUR 2018", "LN(Total assets)#(lf)th EUR 2017", "LN(Total assets)
        #(lf)th EUR 2016", "LN(Total assets)#(lf)th EUR 2015", "LN(Total assets)#(lf)th EUR 2014"}, "Attribute", "Value"),
    #"Split Column by Character Transition" = Table.SplitColumn(#"Unpivoted Only Selected Columns", "Attribute", Splitter.SplitTextByCharacterTransition((c) => not List.Contains({"0"..."9"}, c), {"0"..."9"}),
        {"Attribute.1", "Attribute.2"}),
    #"Renamed Columns" = Table.RenameColumns(#"Split Column by Character Transition",{{"Attribute.1", "Variable"}, {"Attribute.2", "YEAR"}}),
    #"Pivoted Column" = Table.Pivot(#"Renamed Columns", List.Distinct(#"Renamed Columns"[Variable]), "Variable", "Value")
in
    #"Pivoted Column"
```

No syntax errors have been detected.

The Excel Power Query M-code, as shown in the picture above, was used to transform the data from ‘wide’ to ‘long’ format. The headers of the transformed data differ in each transformation, but the transformation principle stayed the same. To be more precise, the exact same steps were executed for all different variables of interest.

Appendix C: Table of Male Dominated Industries

The table below shows the input for the dummy variable maledominated, in order to take into account the effect of female representation in male dominated sectors.

High segregated sectors	Low segregated sectors
Female-dominated sectors	
I - Accommodation & food services	G - Distribution
P - Education	L - Real estate services
Q - Health & social work	S - Other service activities
	T - Households as employers
Male-dominated sectors	
B - Mining & quarrying	A - Agriculture, forestry & fishing
C - Manufacturing	K - Financial & insurance services
D - Electricity, gas & air con supply	R - Arts, entertainment & recreation
E - Water supply, sewerage & waste	
F - Construction	
H - Transport & Storage	
J - Information & communication	
M - Professional, scientific & technical activities	
N - Admin & support services	

Table 14: List of high and low segregated sectors.

Source: Leoncini, R., Macaluso, M., & Polselli, A. (2024). Gender segregation: analysis across sectoral dominance in the UK labour market. Empirical Economics, 67*(5), 2289-2343.*