

# The impact of independent and diverse non-executive directors on the firm's performance

Name student: Jeroen Lückerath

Student ID number: 510495

Supervisor: Gianluca Antonecchia Second assessor: Brigitte Hoogendoorn

Date final version: 13/08/2022

The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

## Table of contents

Chapter 1.	Introduction.....	3
Chapter 2.	Theoretical review.....	5
2.1.	Diversity in corporate governance.....	5
2.1.1.	Literature review.....	5
2.1.1.1.	Theory.....	6
	Resource dependency theory.....	6
	Agency Theory.....	6
2.1.1.2.	Empirical studies.....	7
	Talent pool.....	7
	Different perspectives.....	7
	Critical Mass.....	8
2.1.2.	Diversity Aspects.....	8
2.1.2.1.	Gender diversity.....	8
2.1.2.2.	Nationality diversity.....	9
2.1.2.3.	Age diversity.....	11
2.2.	Board independence.....	12
2.3.	Board composition.....	14
Chapter 3.	Data & Methodology.....	15
3.1.	Data description.....	15
	Dependent variables.....	15
	Independent variables.....	16
	Control variables.....	17
3.2.	Empirical methodology.....	18
3.3.	Robustness checks.....	19
Chapter 4.	Results.....	21
4.1.	Descriptive statistics.....	21
4.2.	Correlation-analysis.....	22
4.3.	Regression-analysis.....	25
Chapter 5.	Discussion/conclusion.....	30
Chapter 6.	References.....	32
Chapter 7.	Appendix.....	39

## Chapter 1. Introduction

In this thesis, I investigate the impact of independent and diverse non-executive directors on firm performance for Dutch listed companies. The Netherlands uses a two-tier governance structure. The executive directors' management board is separate from the supervisory board, the non-executive directors. Internationally, the one-tier governance structure is dominant; executive and non-executive directors jointly form the board. However, in both systems, the executive directors manage the company daily, and non-executive directors monitor, advise and appoint the executive directors as a side-position. The influence of non-executive directors on the executive director's decisions depends on different aspects. For example, by appointing the executives, they choose who runs the firm, by approving the firm's strategy, they influence directions, and by controlling the risks, the executives are willing to take they intervene in business opportunities. This means that although non-executives are not the daily decision makers in a company, they influence these decisions, which impact firm performance.

Several studies investigate whether this impact of non-executives on firm performance depends on who sits on the (supervisory) board or on how much power or influence these non-executive directors have on the decisions made by the executives. For example, with non-executives with similar demographic characteristics, homogenous boards could lead to groupthink and tunnel vision group (Erhardt et al., 2003; Kang et al., 2007). From an economic perspective, it might be sub-optimal for a company to exclude part of the different perspectives in decision making Brammer et al. (2007). Also, when discussing strategy with the executives, the non-executives should challenge the executives, and this will only be possible when diverse perspectives are from a diverse board (Erhardt et al., 2003). Furthermore, Agency Theory suggests that executive directors are opportunistic managers who only take their interests as a guideline. Therefore effective monitoring is only possible if the non-executives are independent of the executives and the company and have a certain power to correct them.

This study will investigate the following research question: Does the presence of independent and diverse directors impact the firm's performance of Dutch public limited companies in the years 2015-2021?

Therefore, this study investigates whether the non-executives directors impact firm performance for Dutch listed companies. It will first investigate if the diversity of demographic characteristics of non-executives, as a proxy of different perspectives on the board, improves company performance. These demographic characteristics are gender, age and nationality. Furthermore, it will investigate whether the proportion of non-executives in the total board, so the numerical power of the number of non-executives as opposed to the number of executives, improves company performance. Higher power of non-executives means more influence, and if the input of

non-executives improves decision-making on the board, it should lead to higher company performance. However, too many non-executives could also lead to contra-productive outcomes, for example, because a larger board is more distant and feels less committed (Coles et al., 2008). Lastly, it will investigate whether these two aspects interact with each other. A relatively bigger supervisory board means more possibilities to appoint board members with different perspectives (diversity). Consequently, as Critical Mass Theory suggests, the board will more easily achieve a certain diversity threshold (Liu et al., 2014).

This study is relevant for several reasons. Previous studies have not yet examined the impact of the combination of three demographic characteristics (gender, age and nationality), as a measure of total diversity, on firm performance in the Dutch context. The focus of most research on the impact of diversity until now was gender diversity (Lückerath-Rovers, 2013), but this is only one aspect of diversity. Age and nationality could be of added value in this kind of research, while these characteristics might be more distinguishing between people's perspectives than gender. Furthermore, when investigating the impact of non-executive directors on the firm's performance, the researchers should also take the relative power of the non-executive into account. The results of this study could add relevant information on what the optimal board size and number of non-executives in a board would be to have sufficient power to impact decision-making by executives but without taking over their management role.

Several parties can use the results, such as companies and executive search firms, when searching for new board members, investors who want to analyse which companies to invest in, and policymakers when addressing diversity enhancing measures.

## Chapter 2. Theoretical review

This research examines the gender, age and nationality diversity and the proportion of non-executive directors on a firm's board. This section first addresses the literature on the relationship of diverse directors and firm performance. Second, the effect of the relative power of non-executive directors on firm performance. And last, the interaction between the board's diversity and the proportion of non-executive directors. There is not one universal theoretical framework for the two components; multiple theories will lead to the hypotheses.

### 2.1. Diversity in corporate governance

#### 2.1.1. Literature review

According to Walt and Ingley (2003) board diversity means that directors add different characteristics and expertise to the board's decision-making process. Diversity can be observed, for example, gender, age and ethnicity, i.e. the demographic characteristics of a director. However, other diversity characteristics are more cognitive and cannot be observed, for example, education, experience, values and personality (Erhardt et al., 2003; Maznevski, 1994). Research on board diversity focuses mainly on demographic characteristics (Erhardt et al., 2003), probably because it is easier to measure than non-demographic characteristics.

In recent years, the board of directors has become more diverse in several countries. For example, for Fortune500 companies, the proportion of women and other minorities on the board increased from 26% in 2010 to 39% in 2020. This increase in diversity in the boardroom has several reasons. First, nowadays, women and minorities form a more significant proportion of the workforce, changing the pool of potential candidates for different positions. This ultimately impacts the divisions of board seat positions (Shrader et al., 1997). Second, the absence of women and minorities in the boardroom has been subject to societal disapproval globally. According to the study of Farrell and Hersch (2005), appointing more female directors is also a response to this outside pressure to appoint more diverse directors. Also, companies that commit themselves to include more female directors in the boardroom have more minorities on the board and vice versa (Carter et al., 2003). An example of the impact of such outside pressure is the substantial increase of appointments of black directors at S&P500 companies following the Black Lives Matter movement in 2020 (32% in 2020, while around 12% and 11% in 2018 and 2019 ). Third, many countries install soft or hard (quota) laws to increase diversity on their boards. In the Netherlands, as of 2021, listed companies must have at least 30% female non-executive directors.

This paragraph will further look at the theoretical perspectives of the benefits of board diversity, the economic arguments for board diversity and finally show research on the three distinct demographic characteristics of the directors (gender, nationality and age).

#### 2.1.1.1. Theory

From a theoretical perspective, the Resource Dependency Theory of Pfeffer and Salancik (2003) and the Agency Theory of Jensen and Meckling (1976) describe the benefits of diversity in the boardroom. Carter et al. (2010) state that Resource Dependency Theory provides more solid evidence than Agency Theory, but they both support the benefits of board diversity on the firm's financial performance.

##### *Resource dependency theory*

Pfeffer and Salancik (2003) argue that companies depend on several environmental dependencies, including different groups of stakeholders. For good corporate performance, boards of directors must form essential links between the company, its environment and the external resources on which a company depends (Lückerath-Rovers, 2013). This link has the following advantages for the company. First, it provides multiple resources useful to the firm, such as expertise and information. Second, it makes communication with important external partners of the firm easier. Third, it provides support from important stakeholders. Fourth, it provides the necessary external legitimacy for the company, such as customers and government agencies (Carter et al., 2010; Pfeffer & Salancik, 2003). Diverse types of directors, with different backgrounds and expertise, provide the company with multiple valuable resources, which should lead to better performance (Carter et al., 2010). In this respect, Liu et al. (2014) refer to the different life experiences and perspectives of women directors, which can make their firms more easily to the society and especially to other women (both as customers and workers).

##### *Agency Theory*

Agency Theory (Jensen & Meckling, 1976) states that non-executive directors have an essential role in controlling and monitoring managers in order to protect the interests of shareholders (Fama & Jensen, 1983). This theory assumes that executive directors are opportunistic, self-serving managers who only pursue their interests and non-executive directors, on behalf of the shareholders, should oversee management (Hillman & Dalziel, 2003). To ensure a close alignment of interests between shareholders and managers, the non-executive directors monitor and, if necessary, dismiss ineffective managers (Kang et al., 2007). According to Erhardt et al. (2003), agency theory suggests that CEOs may need independent oversight. Moreover, the board's supervisory role may be more effective if they consider a wider and more diverse range of opinions, leading to more conflict and better decision-making. However, Carter et al. (2003) argue that including different perspectives by increasing diversity does not necessarily positively affect monitoring managers, as minority board members could be marginalised.

#### 2.1.1.2. Empirical studies

Different studies address the advantages and disadvantages of diversity in the boardroom. Democratic and ethical arguments say it is unfair to exclude people from positions of power. Economic arguments think it is sub-optimal for companies to exclude part of the talent pool or different perspectives in decision making (Brammer et al., 2007). The main reason Brammer et al. (2007) provide is that more diverse boards are more demographically similar to the various stakeholders, such as customers, employees and investors, which has both direct and indirect benefits for performance. Because this paper studies the effect of diversity on the firm's economic performance, it focuses on the economic arguments of diversity in the boardroom.

##### *Talent pool*

Companies make better use of the full range of intellectual capital available by taking a broader perspective on the talent pool and thus including more diverse directors (Daily et al., 1999). Diverse boards could enhance their effectiveness (Adams, Renée B. & Ferreira, 2009) and reflect better the diverse customers and employees (Erhardt et al., 2003). According to Rose (2007) it will also positively affect the internal competition in the firm, as minorities know that the top functions are based on skills and not only on demographic characteristics. Arguments that the talent pool of more diverse directors is not big enough and that there is a 'slow pipeline' should also be debunked, according to Singh & Vinnicombe (2004), while the talent pool is big enough.

##### *Different perspectives*

Diversity increases the number of perspectives assessed in decision-making. In this way, it contributes to the discussion, exchange of ideas and performance of the non-executive board (Erhardt et al., 2003; Kang et al., 2007; Schippers et al., 2003).

More diverse perspectives lead to better decisions and analysis. It increases the level of creativity, for example, because there is less emphasis on conformity to past standards (Cox & Blake, 1991). Besides monitoring, boards also have the task of giving advice, and gender-diverse boards link to higher quality board deliberations on complex issues (Huse & Solberg, 2006; Kravitz, 2003; Liu et al., 2014).

More diversity in boards may not only positively impact decision-making. Diversity may adversely impact group dynamics (Erhardt et al., 2003), diverse teams lead to more complexity and costs to control and coordinate (Dwyer et al., 2003), and the decision process may take longer while the board takes in different perspectives (Rose, 2007). This is also the main reason that in well-governed firms, board diversity may decrease firm performance (Adams & Ferreira, 2009).

However, according to Maznevski (1994), these disadvantages can be overcome by better integration and communication. Erhardt et al. (2003) and Dwyer et al. (2003) claim that the benefits of board diversity will significantly affect firm performance once the board context is supportive.

### *Critical Mass*

Research on the benefits of diversity shows contrary and often not comparable outcomes, which different statistical methods, data, and periods investigated cause (Carter et al., 2010). Also, several studies refer to a certain critical mass of diversity before the advantages in decision-making become apparent. For example, Liu et al. (2014) found that once a board includes three or more women, there is a substantially greater impact on firm performance than with two or less women. According to Rose (2007), the minority could unconsciously adopt the ideas of the majority which prevents a potential performance effect. Also, as mentioned before, diverse board members may be marginalised, which means that even increasing diversity and different perspectives does not necessarily positively affect monitoring managers (Carter et al., 2010).

### 2.1.2. Diversity Aspects

#### 2.1.2.1. Gender diversity

More studies examine the effect of the board's gender diversity on firm performance, compared to age and nationality diversity. There are two potential reasons for this: First, the board's gender diversity is the subject of the (normative) debates leading to diversity quotas in several countries, including the Netherlands. Second, a director's gender is easier to distinguish than his or her age or national origin (Lückerath-Rovers, 2013).

Gender diversity can significantly affect board inputs and corporate governance (Adams & Ferreira, 2009). Female board members debate more issues (Ingley & Walt, 2005), ask more questions (Bilimoria & Wheeler, 2000), take into account a broader range of stakeholders (Adams et al., 2010), are more prepared for board meetings (Pathan & Faff, 2013) and are present more often at meetings (Adams & Ferreira, 2009). More gender-diverse boards also provide more public disclosure (Gul et al., 2011), positively relate to social reputation (Byron & Post, 2016) and hold their CEO accountable more often for bad performances (Adams & Ferreira, 2009). Furthermore, female directors focus more on the social responsibility of a company, and male directors consider the financial performance more important (Terjesen et al., 2015). Although this could implicate that women on boards harm a firm's economic performance, it could still mean that the combination of both corporate social responsibility and economic performance would be optimal, which will be under investigation in this paper.

Brammer et al. (2007) that the number of women directors can depend on the sector in which the company is located. He finds more female directors in Retail, Utilities, Media and Banking, probably because, in these sectors, linkage with relevant stakeholders is essential for the firms. Extra



female directors can create new links with customers, employees or government institutions, which aligns with the Resource Dependency Theory (Pfeffer & Salancik, 2003).

The papers studying the effect of gender diversity on a firm's performance show mixed results. Many studies find a significantly positive relationship between gender diversity and firm performance (Campbell & Mínguez-Vera, 2008; Carter et al., 2003; Erhardt et al., 2003; Liu et al., 2014; Lückerath-Rovers, 2013). Other studies find a significant negative effect of gender diversity on firm performance (Adams & Ferreira, 2009). Finally, a few studies find no effect (Carter et al., 2010; Kochan et al., 2003; Miller & del Carmen Triana, 2009; Rose, 2007).

Most papers use a sample of US firms; Campbell and Mínguez-Vera (2008), however, find a significant positive effect of gender diversity on firm performance with 68 firms from Spain from 1995 to 2000. The paper of Liu et al. (2014) adds to that by showing a positive relationship between gender diversity and firm performance in China. However, they show that the positive effect is primarily caused by the female executive directors than the female non-executive directors (Liu et al., 2014).

In contrast, the results of Adams and Ferreira (2009) suggest that, on average, firms with higher gender diversity perform worse than firms with lower gender diversity. But, they also find that diversity positively impacts the performance of companies with weak governance, where additional board monitoring would benefit their firm value. In contrast, firms with strong governance could ultimately decrease firm value with a more gender-diverse board (Adams & Ferreira, 2009). Finally, Farrell and Hersch (2005) do not find a significant relationship between gender diversity and firm performance, but they do find that there are higher levels of gender diversity in well-performing firms. They explain that the demand for female representation on the board, due to internal preferences or external pressure, allows female directors to choose the better-performing companies (Farrell & Hersch, 2005). Although Miller and del Carmen Triana (2009) find a significant and positive relationship between gender diversity and a firm's innovation levels, they cannot conclude that gender diversity has a direct positive effect on firm performance.

In conclusion, female board members affect board inputs and corporate governance. Whether this leads to higher firm performance is not sure, it would probably depend on the current level of the firm's governance.

#### 2.1.2.2. Nationality diversity

Multiple researchers studied the effect of nationality diversity on firm performance; however, there still is no clear answer to the question. This research will only look at nationality diversity and the number of foreigners, not cultural diversity.

There are advantages and disadvantages to firms appointing a foreigner as a board member; these will highly depend on the firm's complexity and internationalisation (Frijns et al., 2016). According to Fidanoski et al. (2014), large companies appoint foreign directors because they could bring additional and valuable expertise to the board, which a domestic director might not be able to do, especially about the market of his nationality. Secondly, having a foreigner on the board demonstrates to the international financial market that the company is improving its corporate governance, thereby strengthening the company's reputation in this market (Oxelheim & Randøy, 2003).

However, the addition of a foreign director to the board can also be a disadvantage, as the director has less information about domestic affairs (Ujunwa et al., 2012), and it can also lead to more communication problems and conflicts on the board (Luo, 2005; Pearce & Zahra, 1992). To summarise, having a more national diverse board can strengthen the firm's international position. On the other hand, it could hurt the firm's domestic position.

Multiple previous studies on the effect of nationality diversity on firm performance find a positive effect (Carter et al., 2003; Erhardt et al., 2003; Miller & del Carmen Triana, 2009; Nielsen & Nielsen, 2013; Oxelheim & Randøy, 2003; Ujunwa et al., 2012), more minor studies find a negative effect (Frijns et al., 2016; Masulis et al., 2012), and only a few find no effect (Carter et al., 2003; Darmadi, 2010; Rose, 2007). Ujunwa et al. (2012) and Oxelheim and Randøy (2003) both find that adding a foreign director is also essential for companies that are already cross-listed on an international market and even adding a foreign director adds more long-term value than a cross-listing. Miller and Triana (2009) find that innovation and reputation are mediators of the relationship between a nationality diverse board and firm performance. They find that a diverse nationality board produce more diverse ideas, leading to higher innovation. Higher nationality diverse boards also increases the company's reputation by signalling value and norm compliance. Nielsen and Nielsen (2013) also show that nationality diversity helps increase firm performance. However, it is pivotal to consider relevant layers of context (e.g. team, industry and national context) to understand when and under what conditions diversity benefits companies. They find that board tenure, firm internationalisation, and industry complexness strengthen the impact of nationality diversity on firm performance.

Nevertheless, studies do not all show positive effects. Masulis et al. (2012) show that a foreign director harms firm performance, especially when the business abroad is less critical. They give some possible reasons for the negative effect; foreign directors show a worse attendance record, have less power over the CEO and misreport the financials more often intentionally. Frijns et al. (2016) also show an adverse effect of nationality diversity on firm performance. However, both studies find that the negative effects become less or zero when the size of foreign sales and operations increases,

then the foreign directors can contribute substantially to the foreign operations through their background and expertise (Frijns et al., 2016).

The possible reason for finding no relationship between nationality diversity and firm performance is that the minority could unconsciously adopt the ideas of the majority, which prevents a potential performance effect, as previously explained (Rose, 2007).

In conclusion, the magnitude of effect an international board member highly depends on the relevant layers of context a firm operates. Having a more national diverse board can positively affect firm performance in an international context; however, it can also decrease firm performance when it will only enhance conflict or when the foreigner is socialised unconsciously.

### 2.1.2.3. Age diversity

Studies focus less on age diversity than nationality and gender. According to Kang et al. (2007) most directors are old and experienced managers who now, during their retirement, sit on other companies' board. In contrast, the younger age groups are seen as less experienced. However, there is a growing interest in age diversity. One possible reason is that traditional age norms no longer apply in organisations; this is due in part to greater competition and international markets (Shore et al., 2009). Kang et al. (2007) gives the second potential reason for an increase in age diversity on boards, which is that companies want multiple diverse perspectives on their board and partly through succession planning. Nevertheless, even though there has been an increase in age diversity on boards, relatively few researchers are studying its impact, and the results of the few studies are mixed (Kunze et al., 2011).

Although there is limited research on age diversity in boards, some studies find a positive association between age diversity and performance (Engelen et al., 2012; Li & Harrison, 2008) and other studies find a negative association (Abdullah & Ku Ismail, Ku Nor Izah, 2017; Darmadi, 2010; Mahadeo et al., 2012). However, some of these studies have their limitations for this research. Mahadeo et al. (2012) had problems collecting the age information for part of the directors. Darmadi (2010) studies only the effect in a developing country (Indonesia).

Nonetheless, we can take insights from these studies. Li et al. (2011) suggest that age diversity can improve performance in certain situations, at specific companies and in particular industries. The study of Engelen et al. (2012) is quite similar to this study. They researched Dutch limited companies during the financial crisis of 2007. They show that increasing age diversity in supervisory boards in The Netherlands has positive effects up to a certain point. After that, it will hurt the firm's performance.

Overall, a limited number of papers study the effect of age diversity on firm performance, making it difficult to conclude about age diversity on the board, which makes it essential to study the

possible effect of age diversity. This study expects that age diversity has a significant impact on firm performance, especially under certain conditions.

I expect that board diversity increases the firm's performance. For diversity in general, and for the three diversity aspects: gender, nationality and age, therefore hypothesis 1 is the following:

**Hypothesis 1** The greater the diversity on the board, a combination of gender, nationality and age of the non-executive directors, the better firm performance

**Hypothesis 1a** The greater the gender-diversity of the board, the better firm performance

**Hypothesis 1b** The greater the nationality-diversity of the board, the better firm performance

**Hypothesis 1c** The greater the age-diversity of the board, the better firm performance

## 2.2. Board independence

Corporate governance is the system whereby a company is directed (by the executive directors) and controlled (by the non-executive directors), to balance the interests of the shareholders and other stakeholders.

An essential task of the non-executive board is to supervise management to ensure that management follows shareholders' interests to the best of their ability (Terjesen et al., 2015). Three key theoretical perspectives have different views on whether non-executive directors may impact firm outcomes: Agency Theory, Stewardship Theory and Resource Dependency Theory.

First, according to the Agency Theory, non-executive directors minimise the inherent agency conflicts between the owner (the shareholders) and management interests. The theory believes that non-executive directors have fewer potential conflicts of interest, can provide greater integrity, and offer impartiality (Terjesen et al., 2015). It also suggests that a greater proportion of non-executive directors have more prior business experience, which may enable them to be better at monitoring managers (Fama & Jensen, 1983; Kiel & Nicholson, 2003).

In contrast to the Agency Theory, Stewardship Theory finds no support for a positive effect of a larger supervisory board, which would ensure better decision-making and monitoring (Donaldson & Davis, 1994; Kiel & Nicholson, 2003). Stewardship Theory claims that, because managers can usually be trusted, no potential agency conflict will arise between shareholders and managers. Proponents of Stewardship Theory contend that having a majority of executive directors links to superior firm performance, as they work to maximise profit for shareholders (Kiel & Nicholson, 2003). A disadvantage of non-executive directors is, according to Donaldson and Davis (1994), because non-executive directors work part-time for the firm, they will find it difficult to influence management

and performance. An advantage of executive directors would be that they have a better knowledge of the company and the sector in which it operates, which could improve its performance (Andres et al., 2005; Bhagat & Black, 2008). Stewardship Theory also believes that executive directors are naturally trustworthy and, out of fear of jeopardising their reputation, will not harm shareholders' interests (Donaldson, 1990; Donaldson & Davis, 1994). Executive directors, who feel the need to perform well, could also work better without a larger proportion of non-executive directors (Donaldson & Davis, 1994).

Third, Resource Dependency Theory supports a greater proportion of non-executive directors because a larger proportion of non-executive directors allows for more valuable links with external organisations, which would be beneficial for the company. Resource Dependence Theory believes that non-executive directors must form essential links between the company, its environment and the external resources on which a company depends (Lückerath-Rovers, 2013). Non-executive directors can contribute to their firm's performance by offering insightful knowledge and linkage to external resources (Terjesen et al., 2015).

Furthermore, studies investigating the relationship between the proportion of non-executive directors and firm performance are inconclusive. Kiel and Nicholson (2003) and Li and Harrison (2008) find that a higher proportion of non-executive directors would benefit firm performance in some circumstances. Hermalin and Weisbach (1991) and Bhagat and Black (2001) find that the proportion of non-executive directors on the board has no significant impact on firm performance. The results of three other studies suggest that having a higher proportion of non-executive directors would harm a firm's performance (Agrawal & Knoeber, 1996; Andres et al., 2005; Yermack, 1996). The findings of Andres et al. (2005) support that a board should find the right combination in combining executive director's expertise and non-executive independence.

Furthermore, Coles et al. (2008) find a firm-specific maximum for the proportion of non-executive directors, which depends on factors such as technology and the firm's sector. Rosenstein and Wyatt (1997) add that an additional executive director to a non-executive director-dominated board improves firm value, and so does adding a non-executive director to an executive directors-dominated board. These findings suggest that the proportion of non-executive directors follows an inverted "U-shape", meaning that once a firm reaches its firm-specific optimum, adding non-executive directors will decrease firm performance.

Taken together, this paper hypothesises:

**Hypothesis 2** The higher the relative power of the board, a greater proportion of non-executive directors on a company's board, the better firm performance.

### 2.3. Board composition

This study's primary goal is to find the effect of the board's diversity and the proportion of non-executive directors on firm performance. As argued in Hypothesis 1, more diverse boards lead to better decision-making, monitoring and advising than less diverse boards. Hypothesis 2 expects that a higher proportion of non-executive directors leads to better firm performance, through more effective monitoring and forming more valuable links for the firm.

Furthermore, this paper expects that boards with a greater proportion of non-executive directors will enhance the positive impact the board's diversity has on firm performance. This hypothesis follows critical mass theory, which states that a potential performance effect may not occur for small diversity numbers. Because the minority board members unconsciously adopt the ideas of the majority (Rose, 2007), they are less motivated to 'swim against the tide' (Faleye et al., 2011), and they may be marginalised (Carter et al., 2010). When diversity is beyond that certain critical mass, which is only possible in larger boards, the positive effect of diversity will increase.

Terjesen et al. (2015) give the second possible explanation for a positive interaction effect. According to Terjesen et al. (2015), stakeholders may interpret a large board of non-executive directors with few diverse directors as 'friendly', with less power over the executive board and management as self-serving. A large and diverse board will cause the opposite, and stakeholders may be more willing to share the firm's goals.

Taken together, this study expects for total diversity as well as for the three diversity aspects:

**Hypothesis 3** Ceteris paribus, the positive effect of a diverse board (gender, nationality and age) on firm performance is higher when there is a greater proportion of non-executive directors on the board

**Hypothesis 3a** The positive effect of a gender-diverse board on firm performance is higher when there is a greater proportion of non-executive directors on the board

**Hypothesis 3b** The positive effect of a nationality-diverse board on firm performance is higher when there is a greater proportion of non-executive directors on the board

**Hypothesis 3c** The positive effect of an age-diverse board on firm performance is higher when there is a greater proportion of non-executive directors on the board

## Chapter 3. Data & Methodology

This section first describes the data sample and the multiple variables I will use. Secondly, it will look at the hypotheses and the methodology to test these hypotheses. Lastly, it discusses the robustness checks.

### 3.1. Data description

The sample contains yearly data for seven years from 2015 to 2021. The sample only contains Dutch publicly listed companies. It is necessary to have publicly observable firms, to identify the diversity effect on firm performance. The firm's annual report contains (historic) board information, such as the person's board title, tenure, gender, nationality, and age of each board member. I calculate the number of non-executive directors and the different demographic diversity variables using the director data. Each board member is a board member in a specific year if he or she is a board member on the first of September. This board information merges with a dataset from Orbis, which contains firm-specific information, such as the number of employees, sectors, Tobin's Q and ROA.

#### *Dependent variables*

To measure the impact on firm performance I use a financial accounting variable (*Return on Assets; ROA*) and a stock-market-based data variable (*Tobin's Q*). These two measures differ in time perspective, where accounting results focuses on events that have already occurred. Tobin's Q shows the future expectations of the firm's performance (Demsetz & Villalonga, 2001). This study uses return on assets as an accounting-based measure and Tobin's Q ratio as a market-based measure, in line with many researchers (Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Carter et al., 2010; Erhardt et al., 2003). *Tobin's Q* is a good proxy for firm performance since it reflects the market's future earnings expectations and shows a firm's competitive advantage (Campbell & Mínguez-Vera, 2008). *ROA* indicates the accounting income (Carter et al., 2003).

The computation of Return on Assets (ROA) is defined as follows:

$$\text{Return on Assets (ROA)} = \frac{\text{Net income}}{\text{Total assets}}$$

Where, net income is a company's operating income after deducting depreciation, amortisation, interest and taxes. Total assets are the book value of the company's total assets (Erhardt et al., 2003).

The computation of Tobin's Q is defined as follows:

$$\text{Tobin's } Q = \frac{\text{Total market value of the firm}}{\text{Total assets of the firm}}$$

Tobin's Q provides a clear indication of firm performance: investors expect firms with a Tobin's Q ratio greater to use their resources effectively, and with Tobin's Q less than one use their resources poorly (Campbell & Mínguez-Vera, 2008). In summary, firms with a higher Tobin's Q perform better than firms with a lower Tobin's Q.

### *Independent variables*

I use variables that capture board diversity and board power as independent variables. This study uses three different demographic variables, age, gender and nationality. Gender consists of two groups, male and female; Nationality also consists of two groups, Dutch or foreign; Age is divided into three generations, based on research by Becker (1992) who states that age can be better distributed by generations than age limits. The three generations are the Babyboomers (1940-1955), Generation X (1956-1970) and the Pragmatic generation (1970-1985).

The heterogeneity in the board is calculated using the Blau index (Blau, 1977). Previous studies use the Blau index (Darmadi, 2010; Fidanoski et al., 2014; Miller & del Carmen Triana, 2009).

The Blau index is calculated using the following formula:

$$B = 1 - \sum (Pk^2)$$

$P$  stands for the percentage of board members in each available category for the diversity variable and  $k$  is the total number of categories per diversity variable.

The higher the value of the Blau index, the greater the degree of diversity on the board. The minimum is always zero. However, the maximum differs between the demographic diversity variables, depending on the number of categories. The maximum score for a variable is  $(k-1)/k$ . Following this formula, gender and nationality both have the same theoretical maximum, namely 0.5. However, age nationality has a theoretical maximum of 0.75. To compare these variables, they need to be corrected within these differences in the number of groups. Agresti and Agresti (1978) show the formula required for this correction. The procedure is Blau index per variable multiplied by  $k/(k-1)$ . After this correction, the maximum for the three demographic diversity variables is 1.0, and the three variables are comparable.

Although the hypotheses are about total diversity in this study, important insights can still be found from the results of the three demographic variables. Total Diversity is defined as follows:



$$\text{Total Diversity} = \frac{\sum \text{Gender Diversity, Age Diversity, Nationality Diversity}}{3}$$

Lastly, the power of the board is the number of non-executive directors relative to the executive directors. Although the definition of the total board includes both executive and non-executive directors, many studies (Terjesen, 2015) only refer to the non-executives when addressing the board. In this study I follow the same terminology where Board Power is more precisely Supervisory Board Power. Board power is defined as follows:

$$\text{Board Power} = \frac{\text{Number of non – executive directors}}{\text{Number of executive directors}}$$

### *Control variables*

I will also use three control variables: Board Size, Firm Size and Sector. Control variables are needed in this study because other factors may affect the probability of a more diverse board of directors, a higher proportion of non-executive directors and better financial performance.

Following multiple studies, the firm's size should be in the model as a control variable. Even though studies examining the impact of firm size on firm performance show mixed results, most studies tend to find that firm size is positively related to financial performance (Adams & Ferreira, 2009; Carter et al., 2010; Fama & French, 1992). *Firm Size* is the natural logarithm of the firm's total employees. *Board Size* is measured as the number of non-executive directors on the board. This follows some studies (Carter et al., 2003; Darmadi, 2010).

Lastly, the model includes sector dummies for the firm's sector. The specific sectors are divided into eight sector groups, which follows the distribution of the Orbis database:

1. Construction
2. Financial
3. Manufacturing
4. Retail trade
5. Services
6. Transportation and Communication
7. Wholesale Trade
8. Other

The coefficients of the sector dummies will not be shown in the tables, as this is not the purpose of this study. *Sector* will state "yes" if it is controlled. Future research should reveal whether there is a significant difference between the sectors.

I exclude some firm-year observations from the sample; Firstly, this research excludes banks and insurance companies. Because the dependent variables can have different meanings for financial than non-financial firms, due to leverage levels and economic effects. Secondly, Special purpose acquisition companies (SPACs) have the only purpose of acquiring another firm and only exist for a few years; therefore, these companies are not relevant for this study. Third, in a year where a firm has less than three non-executive directors, this firm-year observation is dropped. Because this firm-year observation cannot reach the maximum BlauAge index. Lastly, the analysis will not include a firm-year observation when relevant data is missing for this firm-year observation.

After collecting all data, I detected and adjusted the outliers because outliers can lead to biases in the impact of the independent variable on the dependent. The dependent variables, ROA and Tobin’s Q, both have outliers. Adjusted values replace the outliers for ROA by winsorising the top and bottom of the sample with 5% and for Tobin’s Q by winsorising only the top of the sample with 5%, the results without adjusted values are shown in the appendix.

The sample eventually consists of 453 observations from 2015 to 2021 for 83 unique Dutch listed firms. The number of firms in any year varies from 54 in 2015 to 72 in 2021. This variation is because firms may merge, delist, or go public, the supervisory board may fall below three people, or financial data is missing for the firm-year observation during the sample period.

3.2. Empirical methodology

This paper studies the relationship between the non-executive board’s diversity, the board’s power and firm financial performance. The dataset contains information for the same set of unique Dutch-listed firms over multiple periods. Figure 3.1 shows the conceptual model for this research. The conceptual model includes the hypotheses and the expected direction of the hypotheses.

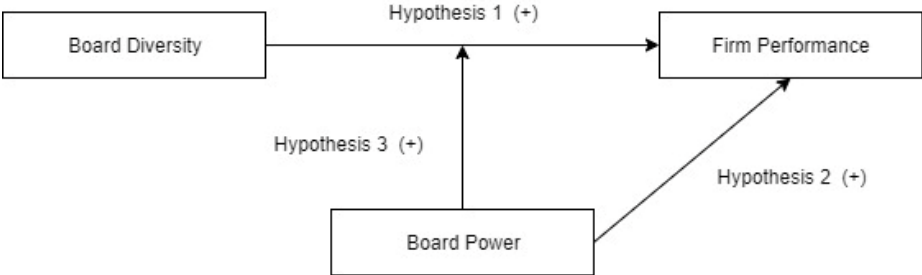


Figure 3.1 Model of hypotheses

The dataset contains unbalanced panel data because some firms have missing data for different periods. I conduct the unbalanced panel study through a multivariate linear regression model. This study uses the random effects model, as both the Hausman test and the Breusch-Pagan test show that the random effects model is appropriate in this analysis (results available in the appendix).

This study has three hypotheses, which I test using two different models. For all the models, the following applies:

$i$  = the company as a unit of analysis,  $t$  = a particular year as a unit of analysis, and  $\epsilon$  = the error term.

The first hypothesis tests the relationship between the diversity, gender, age and nationality, on the non-executive board and firm performance. Hypothesis 1 expects a more diverse non-executive board of directors to impact firm performance positively. Consequently, the hypothesis predicts  $\beta_1$  to be larger than zero. The second hypothesis tests the relationship between the relative power of the non-executive board and firm performance. Hypothesis 2 expects  $\beta_2$  to be larger than zero, as it expects that a higher board's power positively affects its financial performance.

$$\begin{aligned}
 [1] \quad FirmPerformance_{it} &= \beta_0 + \beta_1 * BoardDiversity_{it} + \beta_2 * BoardPower_{it} + \beta_3 * FirmSize_{it} + \beta_4 \\
 &* BoardSize_{it} + \beta_5 * Tenure_{it} + \beta_6 * Sector_{it} + \epsilon_{it}
 \end{aligned}$$

Lastly, the third model tests the interaction effect of the total diversity within the non-executive boards of directors and the board's power on firm financial performance. To help interpret the effect of the interaction, *Board Power* transforms into a discrete variable (*D\_BoardPower*); the variable takes value 1 when the proportion of non-executive directors is above the median and when it is below the median of the distribution. The third hypothesis expects that the impact of diversity the non-executive board on financial performance becomes greater when the non-executive board has more power. Therefore, the hypothesis expects  $\beta_3$  to be larger than zero.

$$\begin{aligned}
 [3] \quad FirmPerformance_{it} &= \beta_0 + \beta_1 * BoardDiversity_{it} + \beta_2 * D\_BoardPower_{it} + \beta_3 \\
 &* BoardDiversity_{it} * D\_BoardPower_{it} + \beta_4 * FirmSize_{it} + \beta_5 * BoardSize_{it} + \beta_6 \\
 &* Tenure_{it} + \beta_7 * Sector_{it} + \epsilon_{it}
 \end{aligned}$$

### 3.3. Robustness checks

This study will also use two different robustness checks to see whether the results hold under other circumstances or are somewhat based on chance. The first robustness check is to lag the

independent variables in order to mitigate the endogeneity problem and hence be used as a robustness check. Appendices C, D and E show the results for the robustness checks.

## Chapter 4. Results

This chapter presents the results and formulates an answer to the hypotheses. First, I present the descriptive statistics. After that, the Pearson's correlation matrix. Furthermore, I show the results regarding the hypothesis.

### 4.1. Descriptive statistics

Table 4.1 shows the descriptive statistics for the dependent, independent and control variables. The sector dummies are not included. The table presents the number of observations, the mean, the standard deviation, the minimum and the maximum for each variable. The first thing to notice is that the number of observations is inconsistent over the variables, caused by missing firm-year data for some variables. The *Return on Assets (ROA)* values ranges from -15.80% to 16.33%, with a mean value of 3.10% and a median of 3.92%, this shows that most of the firms have positive *ROA*. *Tobin's Q* has a mean value of 1.16 and a median of .88, meaning that the market undervalues most of the firms in this sample but, on average, overvalues the firm in the sample.

Furthermore, the results on *Gender Diversity* ( $\mu = .68$ ,  $M = .75$ ) show that boards with more gender diversity are more common than age or nationality-diverse boards. *Age diversity* follows with a mean of .61 and a median of .67. *Nationality Diversity* has the lowest mean and median ( $\mu = .52$ ,  $M = .64$ ). The average *Board Diversity* is .60, and the maximum is .96, showing that no board has an ultimate diverse board. The minimum *Board Diversity* is 0, meaning that there are boards with no diversity at all. Most firms have more than twice the number of non-executive directors than executive directors ( $M = 2$ ); on average, firms also have more non-executive directors than executive directors ( $\mu = 2.45$ ). The minimum *Board Power* shows that no firm has more dan twice the number of executive directors than the number of non-executive directors (min. = .5)

Finally, the results of the control variables provide evidence that the average board size is 5.43, and the minimum and maximum are 3 and 15 board members, respectively. The minimum for the firm size is 1.79, and the maximum is 13.47. The average tenure of the board of directors is 4.46 years and the maximum *Tenure* is 14.70 years.

**Table 4.1** Descriptive statistics

Variables	Obs.	Mean	Median	Std. dev	Min	Max
<b>ROA</b>	439	3.10	3.92	6.92	-15.80	16.33
<b>TobinsQ</b>	431	1.16	.88	1.02	.03	4.32
<b>Board Diversity</b>	453	.59	.60	.22	0	.96
<b>Age Diversity</b>	453	.61	.67	.24	0	1
<b>Nationality Diversity</b>	453	.52	.64	.42	0	1
<b>Gender Diversity</b>	453	.68	.75	.32	0	1
<b>Board Power</b>	453	2.45	2.00	1.33	.5	13
<b>Firm Size</b>	424	7.81	7.91	2.24	1.79	13.47
<b>Board Size</b>	453	5.43	5	2	3	15
<b>Tenure</b>	453	4.46	4.24	2.27	.13	14.70

*Note.* The dependent variables are winsorised; the diversity variables are calculated using the Blau-index; Firm Size is the natural logarithm of the total employees.

#### 4.2. Correlation-analysis

The Pearson's correlation matrix gives an overview of all the variables and their correlations with the other variables.

Table 4.2 reveals some significant correlations between variables. Starting with the dependent variables, *ROA* and *Tobin's Q* are positively correlated ( $\rho = 0.19$ ,  $p < 0.001$ ), which is not very striking since these are two different variables representing both firm performances. *Gender diversity* positively correlates with *ROA* ( $\rho = 0.19$ ,  $p < 0.001$ ). It is the only independent variable that correlates with a dependent variable. The correlation implies that more gender-diverse boards lead to a higher return on assets (*ROA*). *Board Diversity* and *Board Power* do not seem to correlate with financial performance, which contrasts the hypotheses. *Tenure* correlates with both financial performance measures; however, it has a negative correlation with *Tobin's Q* ( $\rho = -0.13$ ,  $p < 0.01$ ) and a positive correlation with *ROA* ( $\rho = 0.11$ ,  $p < 0.05$ ).

*Board Diversity* correlates highly with all other variables except the dependent ones. It is only logical that it is highly correlated with the three demographic diversity variables, as it is the weighted

average of these three variables. The correlation with *Board Size* ( $\rho = 0.38, p < 0.001$ ) implies that bigger boards are also more diverse, and the correlation with *Firm Size* ( $\rho = 0.21, p < 0.001$ ) implies that more significant firms have more diverse boards.

Furthermore, *Board Power* correlates with all the diversity variables, indicating that the higher the power of the board has, the more diverse the board is in every demographic characteristic. *Board Power* is also highly correlated with *Board Size* ( $\rho = 0.45, p < 0.001$ ), which is only logical as well as board size measures the number of non-executive directors.

*Nationality Diversity* and *Gender Diversity* positively correlate with each other ( $\rho = 0.20, p < 0.001$ ). It seems that boards with more women directors are also the boards with more foreign directors, which is in line with Carter et al. (2003). *Age Diversity* does not seem to correlate significantly with *Gender Diversity* or *Nationality Diversity*.

Additionally, *Firm Size* and *Board Size* are highly correlated ( $\rho = 0.63, p < 0.001$ ). This is consistent with the findings of Andres et al. (2005), who show firm size positively relates to the number of directors on the board. *Firm Size* highly positively correlates with *Board Diversity* ( $\rho = 0.21, p < 0.001$ ), *Gender Diversity* ( $\rho = 0.26, p < 0.001$ ) and *Nationality Diversity* ( $\rho = 0.24, p < 0.001$ ). However, it negatively correlates with *Age Diversity* ( $\rho = -0.14, p < 0.01$ ). So, where more significant firms are more diverse in gender and nationality, it is less diverse in age than smaller firms.

As last, *Tenure* negatively correlates with *Board Diversity* ( $\rho = -0.19, p < 0.001$ ), *Age Diversity* ( $\rho = -0.20, p < 0.001$ ), and *Gender Diversity* ( $\rho = -0.16, p < 0.001$ ). This can be because firms that have only recently started to focus on increasing their board diversity and are therefore replacing their long-serving directors. *Tenure* has a slightly positive relation with *Tobin's Q* ( $\rho = 0.11, p < 0.01$ ) and *BoardPower* ( $\rho = 0.10, p < 0.01$ ).

**Table 4.2** Pearson's correlation matrix

Number	Variables	1	2	3	4	5	6	7	8	9	10
1	ROA	1									
2	TobinsQ	0.19***	1								
3	Board Diversity	0.09	0.05	1							
4	Age Diversity	0.06	-0.05	0.36***	1						
5	Nationality Diversity	0.07	-0.02	0.74***	-0.01	1					
6	Gender Diversity	-0.02	0.16***	0.64***	0.05	0.20***	1				
7	Board Power	-0.01	0.04	0.20***	0.13**	0.12*	0.12*	1			
8	Firm Size	-0.07	0.16***	0.21***	-0.14**	0.24***	0.26***	0.07	1		
9	Board Size	-0.05	0.09	0.38***	0.12*	0.34***	0.24***	0.45***	0.63***	1	
10	Tenure	-0.13**	0.11*	-0.19***	-0.19***	-0.04	-0.16***	0.10*	0.05	-0.03	1

*Note.* The dependent variables are winsorised; the diversity variables are calculated using the Blau-index; Firm Size is the natural logarithm of the total employees; \* p<0.05, \*\*<0.01, \*\*\*<0.00



### 4.3. Regression-analysis

This section presents the estimates from the analyses. First, I test the hypotheses in Table 4.3, which presents the effects of the total diversity of the board and the power of the board on financial performances, using *Tobin's Q* and *ROA*. After the results I will show the disaggregated diversity indices. Table 4.4 shows the effects of the three disaggregated diversity variables on *ROA*. Lastly, Table 4.5 presents the effects of the three diversity variables disaggregated diversity variables on *Tobin's Q*.

Table 4.3 presents the estimates from the analysis on each of the dependent variables. First, columns numbered (1) show the results of *Board Diversity* and *Board Power* on financial performance, using *ROA* and *Tobin's Q* as proxies. Second, columns denoted as (2) introduce the interaction term of *Board Diversity* and *D\_BoardPower*. Columns (2) estimate the coefficients of *Board Diversity* and *D\_BoardPower* on firm performance, measured by *ROA* and *Tobin's Q*.

*Board Diversity* has a positive and statistically significant impact on *ROA* ( $\beta = 3.41, p < 0.05$ ) and *Tobin's Q* ( $\beta = 0.36, p < 0.05$ ). This would support hypothesis 1 that the board's total diversity relates positive and significant with the firm's financial performance. However, this supports impact is no longer significant when the model includes the interaction with the board's power model (*D\_BoardPower*), as the coefficients of *Board Diversity* becomes statistically insignificant in the columns (2).

Further, the estimates of *Board Power* as independent variable indicate that it has a negative but statistically insignificant impact on *ROA* and *Tobin's Q*. The result suggests that having at least twice as many non-executive directors than executive directors negatively impacts the firms' *Tobin's Q* ( $\beta = -0.37, p < 0.05$ ). These findings thus would lead to rejection of hypothesis H2, that a higher board power have a positive impact on firm financial performance.

Third, the interaction between *Total Diversity* and *D\_BoardPower* is positive but not significant on *ROA*. However, it has a positive and statistically significant association with *Tobin's Q* ( $\beta = 0.64, p < 0.05$ ).

The results of *D\_BoardPower* on *Tobin's Q* indicate that having twice as many non-executive directors than executive directors has a negative impact on the firms' performance, but for these firms the impact of the boards' total diversity on *Tobin's Q* increases.

No statistically significant coefficients of the independent variables can be found on *ROA*.

With respect to the control variables, *Firm Size* has in both analyses a significant positive impact on *ROA*. *Tenure*, on the other hand, has a negative and significant association with *Tobin's Q*.

**Table 4.3** Linear regression results for the relationship between board diversity and the firms' financial performance

Variables	ROA		Tobin's Q	
	(1)	(2)	(1)	(2)
<b>Board Diversity</b>	3.41**	3.14	0.36**	0.05
	-1.63	-2.12	(0.18)	(0.23)
<b>Board Power</b>	-0.29		-0.03	
	(0.33)		(0.04)	
<b>D_BoardPower</b>		-1.48		-0.37*
		-1.71		(0.18)
<b>BoardDiversity##D_BoardPower</b>		0.87		0.64*
		-2.70		(0.28)
<b>Board Size</b>	-0.01	-0.04	0.00	-0.02
	(0.31)	(0.28)	(0.04)	(0.04)
<b>Firm Size</b>	0.68**	0.65**	-0.06	-0.06
	(0.32)	(0.31)	(0.05)	(0.05)
<b>Tenure</b>	-0.17	-0.15	-0.04**	-0.04**
	(0.16)	(0.16)	(0.02)	(0.02)
<b>Constant</b>	-0.17	0.35	1.86***	2.10***
	-3.64	-3.72	(0.59)	(0.60)
<b>Sector dummies</b>	Yes	Yes	Yes	Yes
<b>R-sqr</b>	0.19	0.21	0.15	0.13
<b>Observations</b>	424	424	416	416

*Note.* Standard errors are in brackets; the dependent variable is winsorised; the diversity variables are calculated using the Blau-index; Firm Size is the natural logarithm of the total employees; \*  $p < 0.1$ , \*\*  $< 0.05$ , \*\*\*  $< 0.01$ .

Tables 4.4 and 4.5 show the sub-effects of *Gender Diversity*, *Age Diversity* and *Nationality Diversity* on the firm's financial performance. Table 4.4 uses *ROA* as proxy of financial performance, and table 4.5 uses *Tobin's Q* as proxy. The columns numbered (1) show the results of the models using the disaggregated diversity variables, *Board Power* and the control variables. The columns denoted as (2), includes *D\_BoardPower* and the interaction term between the diversity variables and the *D\_BoardPower*.

In Table 4.4 the estimate from *Gender Diversity* shows a significant positive impact on *ROA* in column (1) ( $\beta = 2.60$ ,  $p < 0.01$ ), *Board Power* has a negative and insignificant association with *ROA*. In column 2 the impact of *Gender Diversity* becomes statistically insignificant. However, the interaction

term of *Gender Diversity* and *D\_BoardPower* show a positive and statistically significant impact on *ROA* ( $\beta = 4.72, p < 0.01$ ), while *D\_BoardPower* on its own has a significant negative effect ( $\beta = -4.19, p < 0.01$ ). These results imply the same as the previous results on total diversity, that having twice as many non-executive directors than executive directors harm the firms' performance, but the impact of the boards' gender diversity on Tobin's Q becomes greater in these firms.

The results show no significant association between the other two diversity variables, *Age Diversity* and *Nationality Diversity*, and *ROA*. The interaction term between either of these demographic variables and *D\_BoardPower* also demonstrates no significant link. *Board Power* also has a negative but not significant impact on *ROA* in the analyses with *Age Diversity* and *Nationality Diversity*.

*Firm Size* does have a significant and positive impact on *ROA* in each analyses but the second, with the interaction of *Gender Diversity* and *D\_BoardPower*.

**Table 4.4** Linear regression results for the relationship between the board’s gender, age and nationality diversity and the firm’s return on assets

Variables	ROA		ROA		ROA	
	(1)	(2)	(1)	(2)	(1)	(2)
<b>Gender Diversity</b>	2.60***	0.39				
	-1.00	-1.30				
<b>Age Diversity</b>			0.19	-1.09		
			-1.34	-2.06		
<b>Nationality Diversity</b>					0.90	2.35
					-1.13	-1.49
<b>Board Power</b>	-0.29		-0.24		-0.23	
	(0.33)		(0.34)		(0.34)	
<b>D_BoardPower</b>		-4.14***		-2.05		0.15
		-1.40		-1.71		-1.03
<b>Diversity##D_BoardPower</b>		4.72***		2.09		-2.10
		-1.76		-2.56		-1.56
<b>Board Size</b>	0.05	0.07	0.07	0.05	0.04	0.03
	(0.31)	(0.27)	(0.31)	(0.29)	(0.31)	(0.28)
<b>Firm Size</b>	0.62**	0.51*	0.74**	0.71**	0.70**	0.67**
	(0.31)	(0.31)	(0.32)	(0.32)	(0.32)	(0.32)
<b>Tenure</b>	-0.13	-0.10	-0.23	-0.23	-0.22	-0.21
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
<b>Constant</b>	-0.45	1.49	0.55	1.69	0.80	0.31
	-3.54	-3.50	-3.71	-3.86	-3.60	-3.64
<b>Sector</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>R-sqr</b>	0.24	0.28	0.19	0.21	0.18	0.18
<b>Observations</b>	424	424	424	424	424	424

*Note.* Standard errors are in brackets; the dependent variable is winsorised; the diversity variables are calculated using the Blau-index; Firm Size is the natural logarithm of the total employees; \* p<0.1, \*\*<0.05, \*\*\*<0.01.

Table 4.5 uses *Tobin's Q* as proxy for financial performance, in contrast to Table 4.4. However, the table shows some conclusive results.

Again, *D\_BoardPower* has a negative and statistically significant impact on *Tobin's Q* ( $\beta = -0.35$ ,  $p < 0.05$ ) and the interaction of *Gender Diversity* and *D\_BoardPower* still has a positive and significant association with *Tobin's Q* ( $\beta = 0.51$ ,  $p < 0.05$ ). In contrast to *ROA* in Table 4.4 the effect of *Gender Diversity* is not significant. The analyses with *Age Diversity* and *Nationality Diversity* show no significant coefficients. *Tenure* has in every analysis a negative and significant impact on *Tobin's Q*.

**Table 4.5** Linear regression results for the relationship between the board's gender, age and nationality diversity and the firm's *Tobin's Q*

Variables	Tobin's Q		Tobin's Q		Tobin's Q	
	(1)	(2)	(1)	(2)	(1)	(2)
<b>Gender Diversity</b>	0.16 (0.12)	-0.08 (0.14)				
<b>Age Diversity</b>			0.19 (0.14)	0.04 (0.22)		
<b>Nationality Diversity</b>					-0.05 (0.14)	-0.08 (0.18)
<b>Board Power</b>	-0.02 (0.04)		-0.02 (0.04)		-0.02 (0.04)	
<b>D_BoardPower</b>		-0.35** (0.15)		-0.14 (0.18)		-0.02 (0.11)
<b>BoardDiversity## D_BoardPower</b>		0.51*** (0.19)		0.25 (0.27)		0.05 (0.17)
<b>Board Size</b>	0.01 (0.04)	0.00 (0.04)	0.00 (0.04)	-0.00 (0.04)	0.01 (0.04)	0.00 (0.04)
<b>Firm Size</b>	-0.07 (0.05)	-0.08 (0.05)	-0.05 (0.05)	-0.05 (0.05)	-0.06 (0.05)	-0.06 (0.05)
<b>Tenure</b>	-0.04** (0.02)	-0.04** (0.02)	-0.05*** (0.02)	-0.05*** (0.02)	-0.05*** (0.02)	-0.05*** (0.02)
<b>Constant</b>	1.89*** (0.59)	2.08*** (0.60)	1.81*** (0.60)	1.89*** (0.61)	1.92*** (0.59)	1.91*** (0.59)
<b>Sector</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>R-sqr</b>	0.16	0.14	0.16	0.16	0.17	0.16
<b>Observations</b>	416	416	416	416	416	416

*Note.* Standard errors are in brackets; the dependent variable is winsorised; the diversity variables are calculated using the Blau-index; Firm Size is the natural logarithm of the total employees; \*  $p < 0.1$ , \*\*  $< 0.05$ , \*\*\*  $< 0.01$ .

## Chapter 5. Discussion/conclusion

The aim of this study is to provide empirical evidence on the impact of board composition on firm performance, measured as ROA and Tobin's Q. This study looks at gender, age and nationality diversity and the proportion of non-executive directors, as two key components of board composition and the relative power of non-executives. Similar studies have been previously executed in other countries, especially in the US and the UK, and also included other components of board composition. Hence, this study contributes to the literature by addressing the issue in the Netherlands. Further, this paper studies the interaction of diversity and the proportion of non-executive directors, a combination that has not often been studied.

My analysis first examines the first hypothesis about the link between board diversity and firm performance. The results of this analysis were mixed. The results show a positive and significant relationship between total board diversity and ROA and Tobin's Q in one of the regression models (Hyp 1). It seems that this effect is mainly due to gender diversity, as for the separate analyses for gender (Hyp 1a), age (Hyp 1b) and nationality (Hyp 1c) diversity only show a significant relationship with firm performance. Hypotheses 1b and 1c cannot be accepted. Also, the significant relationships of total diversity and gender diversity are not robust to accept Hypotheses 1 and 1a. However, the somewhat weak results do indicate that there is some relationship, and perhaps further research can show to what extent, and in what conditions, diversity can have an effect on performance.

The second hypothesis tests whether the influence or relative power of the non-executive directors (the proportion of non-executive directors compared to executives) has a positive impact on firm performance. The analyses of this study do not show a positive relationship. On the contrary, the results show rather a negative relation extending research of (Agrawal & Knoeber, 1996; Andres et al., 2005; Yermack, 1996). Even though multiple regressions do not show a significant relationship, the results do imply that firms with less than twice as many non-executive than executive directors perform better than firms with more than twice as many non-executive than executive directors. This might be because there is an optimal size for the proportion of non-executive directors, and a negative effect occurs if this is exceeded. Based on the results of this study, the second hypothesis is rejected.

Third, the third hypothesis, which suggested that the interaction of diversity and the proportion of non-executive directors has a positive effect on firm performance cannot be supported also due to mixed results. The results show that the diversity effect on Tobin's Q becomes greater in boards with at least twice the amount of non-executive than executive directors. A result which does not hold with the robustness checks. However, it does show that there is some interaction between diversity and Tobin's Q, only that the chosen method fails to extract a causal effect. Perhaps with future research another method could be looked at that would show a more significant effect. The

results of our analysis indicate that board composition may be of importance in the Netherlands, but that the specific effects for firms is complicated.

Further, age and nationality diversity also show no effect. Gender diversity shows inconclusive results, a significant effect on ROA but not on Tobin's Q and the interaction with the proportion of non-executive directors shows a positive effect on firm performance. The results show that the average tenure of the non-executives on a board has a possible negative effect on Tobin's Q, suggesting that the boards that are too long on their board seats decrease firm performance. These results do not hold up to robustness checks either.

This study faces a few limitations, which future research should overcome. First, although panel data of seven consecutive years this study uses a relatively small sample Dutch publicly listed firms (72 firms). A larger, international sample may provide better validity and reliability. Moreover, a larger sample makes it possible to look at the potential differences across sectors, which would could make researchers better understand the relationship between the board's diversity and power and the firm's performance. Also, the sample of this study consists of listed, relatively large, companies, which makes it more difficult to generalise the effect to smaller, non-listed companies that also use boards. Future research should investigate the effect of board composition on smaller companies.

Second, the results showed some negative effects of board power on firm performance. The analysis I perform expects the relationship between the power of the non-executive board and firm performance to be linear. However, previously studies already suggested that the impact of board power, measured by board independence, follows an inverted "U-shape". Future research must show whether the effects change once the research is based on a curvilinear relationship.

The third limitation is that endogeneity probably strongly influence the results, through omitted variables and reverse causality. There may still be other factors that influence financial performance and board composition can impact financial performance but it could also be the other way around. This study used lagged variables as robustness check to solve endogeneity. Nevertheless, future studies should look at the possibility to use other variables or methods for their research.

Lastly, future research should use other means to investigate the effect of diversity on business performance. It is not a limitation of this research, but it may be a promising option for future research. First, this study focuses on three demographic characteristics, while other characteristics could also be examined, for example education and work background. Other studies are also possible to see in which specific companies' diversity is most effective and whether the effect of diversity possibly runs through other mediators. Finally, studies should research the effect of diversity on other performance measures than just financial ones, such as social performance.

## Chapter 6. References

- Abdullah, S. N., & Ku Ismail, Ku Nor Izah. (2017). *Gender, Ethnic and Age Diversity of the Boards of Large Malaysian Firms and Performance*. (). Rochester, NY: <https://papers.ssrn.com/abstract=2944876>
- Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2), 291-309. 10.1016/j.jfineco.2008.10.007
- Adams, R. B., Hermalin, B. E., & Weisbach, M. S. (2010). The Role of Boards of Directors in Corporate Governance: A Conceptual Framework and Survey. *Journal of Economic Literature*, 48(1), 58-107. 10.1257/jel.48.1.58
- Adams, R. B., & Ferreira, D. (2004). Gender diversity in the boardroom. *European Corporate Governance Institute, Finance Working Paper*, 57, 30.
- Agrawal, A., & Knoeber, C. R. (1996). Firm Performance and Mechanisms to Control Agency Problems between Managers and Shareholders. *Journal of Financial and Quantitative Analysis*, 31(3), 377-397. 10.2307/2331397
- Agresti, A., & Agresti, B. F. (1978). Statistical Analysis of Qualitative Variation. *Sociological Methodology*, 9, 204-237. 10.2307/270810
- Andres, P. D., Azofra, V., & Lopez, F. (2005). Corporate Boards in OECD Countries: size, composition, functioning and effectiveness. *Corporate Governance: An International Review*, 13(2), 197-210. 10.1111/j.1467-8683.2005.00418.x
- Becker, H. A. (1992). *Generaties en hun kansen*. Meulenhoff Amsterdam.
- Bhagat, S., & Black, B. (2001). The non-correlation between board independence and long-term firm performance. *J.Corp.L.*, 27, 231.
- Bhagat, S., & Black, B. S. (2008). *Independent Directors*. (). Rochester, NY: <https://papers.ssrn.com/abstract=1139191>
- Bilimoria, D., & Wheeler, J. V. (2000). Women corporate directors: Current research and future directions. *Women in Management: Current Research Issues*, 2(10), 138-163.
- Blau, P. M. (1977). *Inequality and heterogeneity: A primitive theory of social structure*. Free Press New York.



- Brammer, S., Millington, A., & Pavelin, S. (2007). Gender and Ethnic Diversity Among UK Corporate Boards. *Corporate Governance: An International Review*, 15(2), 393-403. 10.1111/j.1467-8683.2007.00569.x
- Brammer, S., Millington, A., & Rayton, B. (2007). The contribution of corporate social responsibility to organizational commitment. *The International Journal of Human Resource Management*, 18(10), 1701-1719. 10.1080/09585190701570866
- Burgess, Z., & Tharenou, P. (2002). Women board directors: Characteristics of the few. *Journal of Business Ethics*, 37(1), 39-49.
- Burke, R. J. (2000). Women in Management : A Practical Guide for Professionals in Children's Services. *Women in Management*, , 1-320. <https://www.torrossa.com/en/resources/an/4913921>
- Byron, K., & Post, C. (2016). Women on Boards of Directors and Corporate Social Performance: A Meta-Analysis. *Corporate Governance: An International Review*, 24(4), 428-442. 10.1111/corg.12165
- Campbell, K., & Mínguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, 83(3), 435-451.
- Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, 18(5), 396-414.
- Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate governance, board diversity, and firm value. *Financial Review*, 38(1), 33-53.
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics*, 87(2), 329-356. 10.1016/j.jfineco.2006.08.008
- Cox, T. H., & Blake, S. (1991). Managing cultural diversity: implications for organizational competitiveness. *Academy of Management Perspectives*, 5(3), 45-56. 10.5465/ame.1991.4274465
- Daily, C. M., Certo, S. T., & Dalton, D. R. (1999). A decade of corporate women: some progress in the boardroom, none in the executive suite. *Strategic Management Journal*, 20(1), 93-100. 10.1002/(SICI)1097-0266(199901)20:1<93::AID-SMJ18>3.0.CO;2-7

- Darmadi, S. (2010). *Board Diversity and Firm Performance: The Indonesian Evidence*. (). Rochester, NY: <https://papers.ssrn.com/abstract=1727195>
- Demsetz, H., & Villalonga, B. (2001). Ownership structure and corporate performance. *Journal of Corporate Finance*, 7(3), 209-233. 10.1016/S0929-1199(01)00020-7
- Donaldson, L. (1990). The Ethereal Hand: Organizational Economics and Management Theory. *Academy of Management Review*, 15(3), 369-381. 10.5465/amr.1990.4308806
- Donaldson, L., & Davis, J. H. (1994). Boards and Company Performance - Research Challenges the Conventional Wisdom. *Corporate Governance: An International Review*, 2(3), 151-160. 10.1111/j.1467-8683.1994.tb00071.x
- Dwyer, S., Richard, O. C., & Chadwick, K. (2003). Gender diversity in management and firm performance: the influence of growth orientation and organizational culture. *Journal of Business Research*, 56(12), 1009-1019. 10.1016/S0148-2963(01)00329-0
- Engelen, P., Berg, A. v. d., & Laan, G. v. d. (2012). Board diversity as a shield during the financial crisis. *Corporate governance* (pp. 259-285). Springer.
- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate Governance: An International Review*, 11(2), 102-111.
- Erkut, S., Kramer, V. W., & Konrad, A. M. (2008). 18. Critical mass: does the number of women on a corporate board make a difference. *Women on Corporate Boards of Directors: International Research and Practice*, , 222.
- Faleye, O., Hoitash, R., & Hoitash, U. (2011). The costs of intense board monitoring. *Journal of Financial Economics*, 101(1), 160-181. 10.1016/j.jfineco.2011.02.010
- Fama, E. F., & French, K. R. (1992). The Cross-Section of Expected Stock Returns. *The Journal of Finance*, 47(2), 427-465. 10.1111/j.1540-6261.1992.tb04398.x
- Fama, E. F., & Jensen, M. C. (1983). Separation of Ownership and Control. *The Journal of Law and Economics*, 26(2), 301-325. 10.1086/467037
- Farrell, K. A., & Hersch, P. L. (2005). Additions to corporate boards: the effect of gender. *Journal of Corporate Finance*, 11(1), 85-106. 10.1016/j.jcorpfin.2003.12.001

- Fidanoski, F., Simeonovski, K., & Mateska, V. (2014). The impact of board diversity on corporate performance: New evidence from Southeast Europe. *Corporate governance in the US and global settings* (). Emerald Group Publishing Limited.
- Frijns, B., Dodd, O., & Cimerova, H. (2016). The impact of cultural diversity in corporate boards on firm performance. *Journal of Corporate Finance*, 41, 521-541. 10.1016/j.jcorpfin.2016.07.014
- Gul, F. A., Srinidhi, B., & Ng, A. C. (2011). Does board gender diversity improve the informativeness of stock prices? *Journal of Accounting and Economics*, 51(3), 314-338. 10.1016/j.jacceco.2011.01.005
- Hermalin, B. E., & Weisbach, M. S. (1991). The Effects of Board Composition and Direct Incentives on Firm Performance. *Financial Management*, 20(4), 101-112. 10.2307/3665716
- Hillman, A. J., & Dalziel, T. (2003). Boards of Directors and Firm Performance: Integrating Agency and Resource Dependence Perspectives. *Academy of Management Review*, 28(3), 383-396. 10.5465/amr.2003.10196729
- Hillman, A. J., Shropshire, C., & Cannella Jr, A. A. (2007). Organizational predictors of women on corporate boards. *Academy of Management Journal*, 50(4), 941-952.
- Huse, M., & Solberg, A. G. (2006). Gender-related boardroom dynamics: How Scandinavian women make and can make contributions on corporate boards. *Women in Management Review*,
- Ingle, C., & Walt, N. V. D. (2005). Do Board Processes Influence Director and Board Performance? Statutory and performance implications. *Corporate Governance: An International Review*, 13(5), 632-653. 10.1111/j.1467-8683.2005.00456.x
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. 10.1016/0304-405X(76)90026-X
- Kang, H., Cheng, M., & Gray, S. J. (2007). Corporate Governance and Board Composition: diversity and independence of Australian boards. *Corporate Governance: An International Review*, 15(2), 194-207. 10.1111/j.1467-8683.2007.00554.x
- Kiel, G. C., & Nicholson, G. J. (2003). Board Composition and Corporate Performance: how the Australian experience informs contrasting theories of corporate governance. *Corporate Governance: An International Review*, 11(3), 189-205. 10.1111/1467-8683.00318

- Kochan, T., Bezrukova, K., Ely, R., Jackson, S., Joshi, A., Jehn, K., Leonard, J., Levine, D., & Thomas, D. (2003). The effects of diversity on business performance: Report of the diversity research network. *Human Resource Management: Published in Cooperation with the School of Business Administration, the University of Michigan and in Alliance with the Society of Human Resources Management*, 42(1), 3-21.
- Koellinger, P., Minniti, M., & Schade, C. (2008). *Seeing the World with Different Eyes: Gender Differences in Perceptions and the Propensity to Start a Business*. (). Rochester, NY: 10.2139/ssrn.1115354 <https://papers.ssrn.com/abstract=1115354>
- Kravitz, D. A. (2003). More Women in the Workplace: Is There a Payoff in Firm Performance? *Academy of Management Perspectives*, 17(3), 148-149. 10.5465/ame.2003.19198794
- Kunze, F., Boehm, S. A., & Bruch, H. (2011). Age diversity, age discrimination climate and performance consequences—a cross organizational study. *Journal of Organizational Behavior*, 32(2), 264-290. 10.1002/job.698
- Li, J., & Harrison, J. R. (2008). National Culture and the Composition and Leadership Structure of Boards of Directors. *Corporate Governance: An International Review*, 16(5), 375-385. 10.1111/j.1467-8683.2008.00697.x
- Liu, Y., Wei, Z., & Xie, F. (2014). Do women directors improve firm performance in China? *Journal of Corporate Finance*, 28, 169-184. 10.1016/j.jcorpfin.2013.11.016
- Lückerath-Rovers, M. (2013). Women on boards and firm performance. *Journal of Management & Governance*, 17(2), 491-509.
- Luo, Y. (2005). How does globalization affect corporate governance and accountability? A perspective from MNEs. *Journal of International Management*, 11(1), 19-41. 10.1016/j.intman.2004.11.003
- Mahadeo, J. D., Soobaroyen, T., & Hanuman, V. O. (2012). Board composition and financial performance: Uncovering the effects of diversity in an emerging economy. *Journal of Business Ethics*, 105(3), 375-388.
- Masulis, R. W., Wang, C., & Xie, F. (2012). Globalizing the boardroom—The effects of foreign directors on corporate governance and firm performance. *Journal of Accounting and Economics*, 53(3), 527-554. 10.1016/j.jacceco.2011.12.003

- Maznevski, M. L. (1994). Understanding Our Differences: Performance in Decision-Making Groups with Diverse Members. *Human Relations, 47*(5), 531-552. 10.1177/001872679404700504
- Miller, T., & del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management Studies, 46*(5), 755-786.
- Nielsen, B. B., & Nielsen, S. (2013). Top management team nationality diversity and firm performance: A multilevel study. *Strategic Management Journal, 34*(3), 373-382.  
10.1002/smj.2021
- Oxelheim, L., & Randøy, T. (2003). The impact of foreign board membership on firm value. *Journal of Banking & Finance, 27*(12), 2369-2392. 10.1016/S0378-4266(02)00395-3
- Pathan, S., & Faff, R. (2013). Does board structure in banks really affect their performance? *Journal of Banking & Finance, 37*(5), 1573-1589. 10.1016/j.jbankfin.2012.12.016
- Pearce, J. A., & Zahra, S. A. (1992). Board Composition from a Strategic Contingency Perspective. *Journal of Management Studies, 29*(4), 411-438. 10.1111/j.1467-6486.1992.tb00672.x
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Puthenpurackal, J., & Upadhyay, A. (2013). Board gender diversity and firm performance: The impact of information environment. *Financial Management,*
- Rose, C. (2007). Does female board representation influence firm performance? The Danish evidence. *Corporate Governance: An International Review, 15*(2), 404-413.
- Rosenstein, S., & Wyatt, J. G. (1997). Inside directors, board effectiveness, and shareholder wealth. *Journal of Financial Economics, 44*(2), 229-250.
- Sanders, W. G., & Carpenter, M. A. (1998). Internationalization and Firm Governance: The Roles of CEO Compensation, Top Team Composition, and Board Structure. *Academy of Management Journal, 41*(2), 158-178. 10.5465/257100
- Schippers, M. C., Hartog, D. N. D., Koopman, P. L., & Wienk, J. A. (2003). Diversity and team outcomes: the moderating effects of outcome interdependence and group longevity and the mediating effect of reflexivity. *Journal of Organizational Behavior, 24*(6), 779-802.  
10.1002/job.220

- Shore, L. M., Chung-Herrera, B. G., Dean, M. A., Ehrhart, K. H., Jung, D. I., Randel, A. E., & Singh, G. (2009). Diversity in organizations: Where are we now and where are we going? *Human Resource Management Review*, 19(2), 117-133. 10.1016/j.hrmmr.2008.10.004
- Shrader, C. B., Blackburn, V. B., & Iles, P. (1997). Women In Management And Firm Financial Performance: An Exploratory Study. *Journal of Managerial Issues*, 9(3), 355-372. <https://www.jstor.org/stable/40604152>
- Singh, V., & Vinnicombe, S. (2004). Why So Few Women Directors in Top UK Boardrooms? Evidence and Theoretical Explanations. *Corporate Governance: An International Review*, 12(4), 479-488. 10.1111/j.1467-8683.2004.00388.x
- Terjesen, S., Aguilera, R. V., & Lorenz, R. (2015). Legislating a woman's seat on the board: Institutional factors driving gender quotas for boards of directors. *Journal of Business Ethics*, 128(2), 233-251.
- Terjesen, S., Sealy, R., & Singh, V. (2009). Women Directors on Corporate Boards: A Review and Research Agenda. *Corporate Governance: An International Review*, 17(3), 320-337. 10.1111/j.1467-8683.2009.00742.x
- Ujunwa, A., Okoyeuzu, C., & Nwakoby, I. (2012). Corporate board diversity and firm performance: Evidence from Nigeria. *Revista De Management Comparat International*, 13(4), 605.
- Walt, N. v. d., & Ingley, C. (2003). Board Dynamics and the Influence of Professional Background, Gender and Ethnic Diversity of Directors. *Corporate Governance: An International Review*, 11(3), 218-234. 10.1111/1467-8683.00320
- Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40(2), 185-211. 10.1016/0304-405X(95)00844-5

Chapter 7. Appendix

**Appendix A** The Hausman test

	Coefficient
Chi-square test value	11.19
P-value	0.083

**Appendix B** The Breusch-Pagan Lagrange multiplier (LM) test

	Coefficient
Chi-square test value	375.78
P-value	0.000

**Appendix C** Additional regression analyses of the lagged board diversity on ROA and Tobin's Q

Variables	ROA		Tobin's Q	
	(1)	(2)	(1)	(2)
<b>Board Diversity</b>	-0.38	0.47	-0.21	-0.44*
	-1.76	-2.26	(0.20)	(0.26)
<b>Board Power</b>	-0.39		-0.01	
	(0.34)		(0.04)	
<b>D_BoardPower</b>		-0.21		-0.32
		-1.85		(0.20)
<b>BoardDiversity##D_BoardPower</b>		-1.46		0.48
		-2.95		(0.32)
<b>Board Size</b>	0.01	-0.08	-0.01	-0.01
	(0.32)	(0.31)	(0.04)	(0.04)
<b>Firm Size</b>	0.88***	0.90***	-0.01	-0.02
	(0.33)	(0.33)	(0.05)	(0.05)
<b>Tenure</b>	-0.25	-0.24	-0.04**	-0.04**
	(0.18)	(0.18)	(0.02)	(0.02)
<b>Constant</b>	-0.27	-0.60	1.29**	1.52**
	-3.65	-3.82	(0.64)	(0.66)
<b>Sector dummies</b>	Yes	Yes	Yes	Yes
<b>R-sqr</b>	0.20	0.21	0.18	0.17
<b>Observations</b>	349	349	343	343

Note. Standard errors are in brackets; the dependent variable is winsorised; the diversity variables are calculated using the Blau-index; Firm Size is the natural logarithm of the total employees; \* p<0.1, \*\*<0.05, \*\*\*<0.01.

**Appendix D** Additional regression analyses of the lagged disaggregated board diversity on ROA

Variables	ROA		ROA		ROA	
	(1)	(2)	(1)	(2)	(1)	(2)
<b>Gender Diversity</b>	1.20	1.11				
	-1.13	-1.43				
<b>Age Diversity</b>			-0.68	1.56		
			-1.55	-2.41		
<b>Nationality Diversity</b>					-0.56	0.50
					-1.24	-1.65
<b>Board Power</b>	-0.44		-0.39		-0.40	
	(0.34)		(0.34)		(0.34)	
<b>D_BoardPower</b>		-1.35		1.16		-0.33
		-1.42		-1.98		-1.14
<b>Diversity##D_BoardPower</b>		0.30		-3.54		-1.43
		-1.88		-2.95		-1.73
<b>Board Size</b>	0.00	-0.07	0.02	-0.07	0.02	-0.09
	(0.32)	(0.30)	(0.32)	(0.31)	(0.32)	(0.31)
<b>Firm Size</b>	0.81**	0.81**	0.85***	0.91***	0.89***	0.91***
	(0.33)	(0.33)	(0.33)	(0.32)	(0.32)	(0.33)
<b>Tenure</b>	-0.21	-0.19	-0.25	-0.23	-0.25	-0.24
	(0.18)	(0.18)	(0.18)	(0.18)	(0.18)	(0.18)
<b>Constant</b>	-0.77	-0.40	0.09	-1.51	-0.48	-0.71
	-3.60	-3.64	-3.77	-4.08	-3.62	-3.70
<b>Sector</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>R-sqr</b>	0.22	0.23	0.20	0.21	0.21	0.21
<b>Observations</b>	349	349	349	349	349	349

Note. Standard errors are in brackets; the dependent variable is winsorised; the diversity variables are calculated using the Blau-index; Firm Size is the natural logarithm of the total employees; \* p<0.1, \*\*<0.05, \*\*\*<0.01.



**Appendix E** Additional regression analyses of the lagged disaggregated board diversity on Tobin's Q

Variables	Tobin's Q		Tobin's Q		Tobin's Q	
	(1)	(2)	(1)	(2)	(1)	(2)
<b>Gender Diversity</b>	0.03 (0.13)	-0.14 (0.16)				
<b>Age Diversity</b>			-0.02 (0.17)	-0.41 (0.28)		
<b>Nationality Diversity</b>					-0.12 (0.16)	-0.16 (0.20)
<b>Board Power</b>	-0.01 (0.04)		-0.01 (0.04)		-0.01 (0.04)	
<b>D_BoardPower</b>		-0.30* (0.16)		-0.43* (0.22)		-0.10 (0.13)
<b>BoardDiversity## D_BoardPower</b>		0.37* (0.20)		0.60* (0.33)		0.08 (0.19)
<b>Board Size</b>	-0.02 (0.04)	-0.01 (0.04)	-0.02 (0.04)	-0.01 (0.04)	-0.01 (0.04)	-0.01 (0.04)
<b>Firm Size</b>	-0.02 (0.05)	-0.03 (0.05)	-0.02 (0.05)	-0.03 (0.05)	-0.01 (0.05)	-0.01 (0.05)
<b>Tenure</b>	-0.04* (0.02)	-0.04* (0.02)	-0.04* (0.02)	-0.04** (0.02)	-0.04** (0.02)	-0.04** (0.02)
<b>Constant</b>	1.26** (0.64)	1.43** (0.65)	1.27** (0.65)	1.62** (0.67)	1.24* (0.64)	1.30** (0.65)
<b>Sector</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>R-sqr</b>	0.17	0.17	0.18	0.18	0.17	0.17
<b>Observations</b>	343	343	343	343	343	343

*Note.* Standard errors are in brackets; the dependent variable is winsorised; the diversity variables are calculated using the Blau-index; Firm Size is the natural logarithm of the total employees; \* p<0.1, \*\*<0.05, \*\*\*<0.01.