



MASTER THESIS

THE EFFECT OF BOARD DIVERSITY ON FIRM PERFORMANCE IN THE NETHERLANDS

Author	Afram Dogan
Student number	S1857428
E-mail	a.dogan@student.utwente.nl
Study	Master of Business Administration
Specialization	Financial Management
Examiner	Prof. Dr. R. Kabir Dr. X. Huang
Date	November 23, 2020

University	University of Twente, Enschede, the Netherlands
Faculty	Behavioural, Management and Social sciences (BMS)
Department	Finance & Accounting (F&A)

PREFACE

This thesis is written as a completion to my master degree in Business Administration, with the specialization Financial Management, at the University of Twente. This thesis is written in the period between April 2020 and November 2020. The aim of this thesis is to examine the effect of board diversity on firm performance in the Netherlands. The purpose of this preface is to thank the people that helped me during this process.

This research could not be completed without the help of many involved ones, who I would like to thank in particular. First of all, I would like to thank Prof. Dr. R. Kabir, my first supervisor, for his critical advice and support during this process. His presence throughout this process kept me focused and motivated to maximize the level of this thesis. Next, I would like to thank Dr. X. Huang, who was my second supervisor. Her feedback and help was also very important for me to finish my thesis.

I would also like to thank my wife and family who supported me at all times. When needed they sent me in the right direction and their constructive criticism has improved the quality of my thesis. Their motivation has helped me to stay focused and to achieve my goal.

Afram Dogan

Enschede, November 2020

ABSTRACT

This study examines the effect of board diversity on firm performance of 100 Dutch firms listed on the Euronext Amsterdam for the years 2018 and 2019. Firm performance is measured by return on assets, return on equity and Tobin's Q. The board diversity characteristics that are examined are gender, age, and nationality. In order to examine the effect of board diversity on firm performance, the ordinary least squares (OLS) regression analysis is performed.

This study finds that diversity on boards does not affect firm performance. First, the results show no relationship between gender diversity and firm performance. Second, the results show limited evidence for a positive effect of age diversity on firm performance. However, based on the major results the conclusion can be drawn that age diversity does not affect firm performance. Last, nationality diversity has no effect on firm performance. The overall results of this study show that board diversity does not influence firm performance.

TABLE OF CONTENT

1	Introduction	1
1.1	Background information.....	1
1.2	Research objective and contribution.....	2
1.3	Outline of the study	4
2	Literature review	5
2.1	Corporate governance.....	5
2.2	Board diversity	6
2.3	Theoretical approaches.....	6
2.3.1	Business case theory.....	7
2.3.2	Resource dependency theory.....	8
2.3.3	Human capital theory	9
2.3.4	Agency theory	9
2.4	Board diversity characteristics	10
2.4.1	Gender	10
2.4.2	Age	12
2.4.3	Nationality	13
2.5	Gender quota	15
2.6	Hypothesis development	16
3	Methodology	17
3.1	Methods used in prior research.....	17
3.1.1	OLS regression	17
3.1.2	Fixed and random effects model	18
3.1.3	2SLS regression.....	18
3.2	Method used in this research	19
3.3	Model.....	19
3.4	Measurement of variables.....	20
3.4.1	Independent variables.....	20

3.4.2	Dependent variables	21
3.4.3	Control variables	21
3.5	Robustness check of results.....	22
4	Data	24
4.1	Research sample	24
5	Results	26
5.1	Descriptive statistics.....	26
5.2	Correlation analyses	27
5.2.1	Pearson's correlation matrix.....	27
5.2.2	Variance Inflation Factor.....	29
5.3	Regression analyses.....	29
5.3.1	Gender diversity	30
5.3.2	Age diversity	31
5.3.3	Nationality diversity	32
5.4	Robustness check.....	34
6	Discussion and conclusion	40
	References.....	43
	Appendices.....	47

1 INTRODUCTION

This study examines the effect of board diversity on firm performance of 100 Dutch firms listed on the Euronext Amsterdam for the years 2018 and 2019. This first chapter will provide background information regarding board diversity and firm performance. Besides, the research objective, contribution and research question will be formulated. Lastly, the thesis outline will be presented.

1.1 Background information

The board of directors is the most important decision-making body in a corporation. Boards are responsible for approving major strategic and financial decisions. Some people look at the board as a group of individuals and some consider the board as a joint body. Within the last few decades, there has been a growing interest in the diversity of the boards and its relationship with firm performance. This is due to various reasons. First, political and social entities are increasingly calling for diversified boards, and firms announce diversity policies to make their board a better representation of the society. Due to this awareness, firms become more diverse, in all possible layers, in terms of gender, age, and nationality. Another reason is the implementation of gender quota laws for boards by governments in order to change the level of diversity. In 2003, Norway was the first European country that introduced a gender quota that at least 40% of the boards should be composed of women. In 2013, the Dutch government followed by introducing a target that at least 30% of the top board seats should be occupied by women. Furthermore, the increasing globalization. In a more globalized world firms have to accommodate a higher degree of diversity among their employees at different managerial levels, especially at the top of the organization, according to Gupta and Govindarajan (2002). Summarizing, board diversity has become a relevant corporate governance issue for managers, directors and shareholders.

Board diversity is a broad concept and can therefore be interpreted in various ways. Research on diversity has led to the common distinction between two types of diversity: observable and non-observable diversity. Observable board diversity can be understood in terms of demographic diversity such as gender, age, nationality and educational knowledge, while cultural values or personality characteristics are examples of non-observable diversity. However, most research about the effect of diversity on firm performance focus on observable, demographic diversity. This research also conceptualizes diversity in terms of demographic diversity of board member's gender, age and nationality.

The result of a more diverse board cannot be determined in advance. A more diverse board can both positively and negatively influence firm performance. Diversity can increase the quality of decision-making, which will lead to higher productivity and profitability. On the other hand, diversity can generate more conflicting opinions which can result in a more time consuming and less effective decision-making process. To substantiate these mixed clarifications there will be used four theories. The

first theory is the business case theory, which provides different propositions to underline the importance of diversity. The second theory is the resource dependency theory. This theory states that firms can benefit from the linkages to external environment that are realized by the board. According to this theory, a more diversified board has more beneficial resources and therefore a more diverse board leads to better firm performance. The third theory is the human capital theory, often called the complementary theory to the resource dependency theory. This theory adds the skills, know-how, expertise and experience of the board members to the human capital that can be used to influence the effectiveness of the board. The last theory is the agency theory. This theory states that diversity on boards can increase the board independence and the ability to align the interest of management and stakeholders.

In line with these mixed theoretical suggestions about the effect of diversity, existing empirical studies are also characterized by inconclusive results. There are empirical results that show a positive relationship between board diversity and firm performance. Carter, Simkins and Simpson (2003) shows a positive effect of board diversity on firm performance in the US. Lückerath-Rovers (2013) concludes that more women on board is positively affecting firm performance in the Netherlands. In contrast to these positive effects of board diversity, there are also numerous studies that find no relationship between board diversity and firm performance, such as Marinova, Plantenga and Remery (2016) and Randøy, Thomson and Oxelheim (2006). Lastly, there are also some studies that show a negative relationship between board diversity and firm performance, like Adams and Ferreira (2009). As director characteristics could affect the effectiveness and their influence on boards, it is likely that differences in nationality, age and gender will affect firm performance. Therefore, studying diversity can help understand the effects of board diversity on board effectiveness and firm performance (Adams, Hermalin & Weisbach, 2010). Further clarification and substantiation regarding the possible effects of board diversity will be formulated in Chapter 2 based on the underlying theories.

1.2 Research objective and contribution

The goal of this study is to examine the influence of board diversity, based on gender, age and nationality, on firm performance of 100 Dutch firms listed on the Euronext Amsterdam for the years 2018 and 2019. This research is relevant for several reasons.

First of all, it addresses the limitations and recommendations of studies done by Engelen, Berg and Laan (2012), van Overveld (2012) and Marinova et al. (2016). These studies have investigated board diversity and its effect on firm performance in the Netherlands. That is why these recommendations are observed and used. Engelen et al. (2012) concluded that there is no relationship between board diversity and firm performance during the financial crisis in the Netherlands. They stated that further research is necessary in a more stable economic scenario. This is in line with the recommendations mentioned by van Overveld (2012), which stated that a research in a different year is needed, he preferred a long time after the economic crisis. Marinova et al. (2016) found no relationship between board gender diversity

and firm performance for Dutch boards. Their study suggests that there is a need for more empirical research due to the limited European evidence on the effect of board diversity and firm performance.

Secondly, the gender quota provides new motives for firms to include more women to the board. Like mentioned in section 1.1, a target of 30% women on board was introduced in 2013 by the Dutch government. If companies fail to reach this percentage, the “apply or explain” principle is applied, this means that this needs to be explained in the annual report, without further measures being taken. However, in December 2019 the House of Representatives voted in favour of an obligation of a gender quota. This means that the Netherlands will also set a gender quota in the near future. Since it is certain that the Netherlands will set a gender quota, the influence of the quota in other countries can be examined. Norway was the first European country that set a gender quota, followed by Spain, France and Iceland, all of which set a minimum quota of 40%. Italy has a quota of 30%. All these countries have seen an increase in the share of women on boards as a result of the introduction of the quota. Ahern and Dittmar (2012) investigated the influence of the gender quota. This study concluded that the introduction of the quota in Norway had a negative effect on the financial performance of firms. Research into the effect of a quota in the Netherlands is not possible, since an official quota is not yet being used. Nevertheless, a conclusion can be drawn with regard to the effect of the advisory target set in 2013. Evidence from the Netherlands can help to confirm the negative effect or to give an opposite view by providing positive results. Since it is certain that in the near future the gender quota will be introduced in the Netherlands, this study can be used as a starting point or as comparison material for further studies once the quota has been set.

Thirdly, most of the studies focused on one or two dimensions and ignored other dimensions of diversity. For example, Marinova et al. (2016) focused on gender diversity, Mahadeo, Soobaroyen and Hanuman (2012) combined both gender and age to investigate board diversity, Carter, Simkins and Simpson (2010) and Carter et al. (2003) looked at the effect of gender diversity and ethnic minorities and Kim and Lim (2010) investigated board diversity based on the age of the directors. In contrast to these investigations, this research will look at three aspects of diversity, namely the gender, the age and the nationality of the board members. Some studies have examined these three aspects, such as Engelen et al. (2012) and Randøy et al. (2006). Analyzing multiple dimensions of board diversity might offer better insights into the influence of board diversity on firm performance. Using multiple diversity dimensions potentially allows answering the question whether there exist a relationship between the board diversity characteristics and firm performance.

Next to empirical contributions, this study also has practical contributions. The outcome of this study offers a framework for firms and their management supervisory since it analyses the effect of board diversity on firm performance. It gives boards an insight into the influence of employing a diverse board of directors, and whether to attract a director with certain characteristics. Firms can take this into account when hiring personnel and adopt policies. Ultimately, this research could also be suitable for the Dutch government, since the Central Planning Bureau uses master theses in their files to strengthen their

arguments, for example in their documentation about the gender quota ‘Vrouwen aan de top’, published in 2019. This documentation concludes that gender quotas lead to an increase of the share of women on boards and thus increases the equal opportunities between men and women. Further clarification regarding this research will be illustrated in section 2.6.

Summarized, there are several reasons to conduct this study. First, to contribute to the limited European and especially limited Dutch evidence on board diversity and firm performance as until now most empirical research has focused on the US. Second, a conclusion can be drawn with regard to the effect of the advisory target set in 2013. Furthermore, this study can be used as a starting point or as comparison material for further studies once the quota has been set, since it is certain that in the near future the gender quota will be introduced in the Netherlands. Next, to contribute to the limited evidence on the three different board diversity characteristics gender, age and nationality. Since all three dimensions will be examined separately this study has the ability to draw conclusions regarding their individual effect on firm performance. Lastly, the outcome of this study can be used as a framework for firms and their management supervisory. Furthermore, this study may be suitable for the Dutch government in gaining insights into the effect of the women target set in 2013. Therefore, the following research question will be investigated: *What is the influence of board diversity on firm performance of listed firms in the Netherlands?*

1.3 Outline of the study

The outline of this study is as follows. The next chapter presents the literature review. The literature review discusses the corporate governance mechanisms, the theories regarding board diversity, the empirical findings and the hypotheses development. In chapter three the research methodology is presented. The research methodology discusses the methods, variables and robustness check of results used in this research. The fourth chapter presents the data sample and resources used in this research. Chapter five presents the results of the regression analyses and gives an answer on the hypotheses. Chapter six contains the conclusion, the limitations and recommendations for future research.

2 LITERATURE REVIEW

This section will start giving an overview of the existing literature and will end with determining a hypothesis. Firstly, information about the importance and the function of corporate governance and the board of directors in general will be given. Furthermore, this section will focus on the corporate governance structure in the Netherlands. Subsequently, the relationship of board diversity and firm performance will be explained by various theories. Thereafter, a literature review of previous empirical research will be addressed in order to get insights in the effect of the different characteristics gender, age and nationality. Finally, taking all the previous information in consideration, the hypotheses will be developed.

2.1 Corporate governance

The term corporate governance refers to the system which is responsible for directing and controlling an organization. Gillan and Starks (1998) define it more specifically and conclude that corporate governance is the system of laws, rules, and factors that control operations at an organization. Economic theory assumes that the board of directors is a crucial corporate governance mechanism of firms (Rose, 2007). Firms are financed by shareholders and since these shareholders do not exercise the managing tasks by themselves these firms are managed by a board of directors, elected by the shareholders. In this way, the shareholder ensures that there is a say in the board. The board of directors' tasks are to guide and to execute decisions of an organization.

Corporate governance systems differ across countries. There are two main models that can explain the structure of the corporate governance within boards. These two models are the one-tier model used in common law countries such as the UK and the US, also called the Anglo-Saxon countries, and the two-tier model, used in several code law countries such as Germany and Denmark, also called the Continental countries. Despite the fact that the boards are formulated in a different way across countries, the purpose of the boards is the same.

The two-tier board of directors is a system in which the firm is governed by two distinct boards of directors, the management board and the supervisory board, where both boards have different responsibilities. The management makes decisions related to the daily operations and reports to the supervisory board. And the supervisory board makes decisions regarding long term strategies and supervises the management. The members of the supervisory board consist of shareholders representatives and are therefore directly elected by the shareholders. In addition, an individual cannot serve on both the supervisory and management boards of the same firm.

The one-tier board of directors, also known as unitary board of directors, is a single body of directors in which the tasks of the management team and the supervisory board are combined. In the Anglo-Saxon countries this is called the board of directors. This construction includes both executive directors and non-executive directors, this means that this model consists of one single layer. Normally the executive

directors can be seen as the management team and the non-executive directors as the supervisory board. In this model both executive and non-executive directors are responsible for the daily operations of a firm and both are responsible for the control and advice. Concluding, all the directors have the same responsibilities and liabilities that come together in one body. The advantage of the one-tier board is that the decision-making process is expected to be less, as decisions only have to pass one body. It is therefore believed that an one-tier system has more influence than a two-tier system and is able to switch quicker when needed. Also the synergy within this single body should be stronger as the distance between the executive and the controlling body has diminished.

Most companies in the Netherlands originally use a two-tier board, as it was mandatory until 2013 to separate management and supervision into separate bodies. However, since 2013 Dutch firms have the right to choose the one-tier board structure. Especially for firms whose ambitions cross the border of the Netherlands the possibility to opt for this governance structure model is interesting and valuable. Multinationals such as Unilever and Shell have already adopted the one-tier board model.

2.2 Board diversity

Diversity has been one of the most important corporate governance issues in the last couple of decades. Diversity can be understood as any difference in attributes between individuals which distinguishes a person from oneself (Williams & O'Reilly, 1988). Many different variables come to mind when attempting to define diversity. However, previous research on diversity has led to the common distinction between two types of diversity: observable and non-observable diversity. Observable board diversity can be understood in terms of demographic diversity such as gender, age, nationality and educational knowledge, while cultural values or personality characteristics are examples of non-observable diversity (Erhardt, Werbel & Shrader, 2003). However, most research into board diversity focuses on observable diversity. This is due to the fact that non-observable characteristics are much more difficult to investigate. Similarly, this research will determine board diversity in terms of observable diversity.

2.3 Theoretical approaches

Like mentioned in the introduction, the result of a more diverse board cannot be determined in advance. A more diverse board can both positively and negatively influence firm performance. Diversity can increase the quality of decision-making, which will lead to higher productivity and profitability. On the other hand, diversity can generate more conflicting opinions which can result in a more time consuming and therefore a less effective decision-making process.

Terjesen, Sealy and Singh (2009) present a review of the theoretical and empirical research that exists on the issue of women on corporate boards based on 400 publications in various domains (e.g. psychology, gender, leadership and law). This study indicates that existing research has produced mixed results. According to Carter et al. (2010), no single theory predicts the nature of the relationship between

board diversity and firm performance but several theories from various fields can provide insight into the issue.

Looking at the existing literature, it becomes clear that researchers often use several theories simultaneously and that certain theoretical frameworks are more used than others. Resource dependency theory, human capital theory and agency theory are frameworks that are often used by researchers on this topic. The institutional theory is an example of a less common theory. Carter et al. (2003) use the agency theory and the business case theory. Carter et al. (2010) use the resource dependency theory, the human capital theory, the agency theory and the social psychological theory. Liu, Wei and Xie (2014) use the resource dependency theory, the agency theory and the token status theory. Campbell and Mínguez-Vera (2008) use the business case theory and the agency theory. And Rose (2007) uses the human capital theory and the agency theory.

As there is no single theory explaining the link between board diversity and firm performance, this research will discuss various theories. This study will focus on the business case theory, the resource dependency theory, the human capital theory and the agency theory. The business case theory focuses on workplace diversity in general and takes gender, age and nationality into consideration. This theory provides several explanations for the relationship between diversity and firm performance, it is an applicable theory as it discusses the gender, age and nationality diversity of the board. The resource dependency theory argues that the purpose of the board is to establish linkages with external organizations to benefit from these linkages. Since a more diverse board brings multiple perspectives, which improves the position of the board in relation to external parties, this is a good theory to use. The human capital theory predicts that the performance of the board is affected by gender diversity as a result of diverse and unique human capital. If human capital of directors is influenced by gender, it is reasonable to hypothesize that diversity based on age and nationality influences the human capital of the directors. Although Carter et al. (2003) state that the agency theory does not provide a clear prediction of the link between board diversity and financial performance, studies into the effect of board diversity almost always use agency theory. Since the interests of directors and shareholders can differ, this may lead to conflicts. Hence, the agency theory is an applicable theory to use in this study. In order to identify and ultimately argue the results of this study, the theories will be presented in the next section.

2.3.1 Business case theory

Cox and Blake (1991) and Robinson and Dechant (1997) provide good summaries of the conceptual ‘business case’ for diversity. Cox and Blake (1991) provide suggestions for improving organizational capability to manage diversity. And Robinson and Dechant (1997) build upon the study and provide an update regarding the reasons for managing diversity. Similarity between these two studies is that they assume diversity affects a firm’s long-term and short-term financial value in several ways.

Robinson and Dechant (1997) clarifies the importance of diverse management groups for governing an organization and assumes that greater diversity increases a firm’s financial value. This theory gives

different propositions to underline this importance of diversity. First, corporate diversity improves the understanding of the marketplace. Matching the diversity of a firm to the diversity of the firm's potential customers and suppliers increases market penetration. Companies can benefit from the good will of diverse consumers who prefer to spend their money on products produced by a diverse workforce. Second, diversity increases creativity and innovation. This study assumes that increased cultural diversity results in higher presence of different perspectives for the performance of creative tasks, which leads to higher creativity and higher innovation. Third, diversity increases the quality of problem-solving. A more diverse team produces more innovative solutions to problems, since differences among team members allow them to see problems from various perspectives based on their experiences. It also ensures that many different possible solutions are considered. Fourth, diversity enhances leadership effectiveness. The demographic composition of management teams affects competitive strategy and financial effectiveness. Lastly, diversity supports to build more effective global relationships due to different cultural backgrounds which can be also incorporated into marketing, sales and customer service strategies.

In addition, Cox and Blake (1991) formulate arguments related to various areas where solid management can create a competitive advantage. This research states that as an organization becomes more diverse, the cost of a poor job in workers integration will increase. A management that can handle this well, will create cost advantage over those who do not. Another argument is that the cultural sensitivity and other perspectives foreign members bring to an organization should improve the marketing and creativity of the organization. Additionally, a more diverse group potentially produces better decisions due to the wider range of perspectives and the more critical analysis.

Summarized, the business case theory is a conceptual case theory for diversity which provides several arguments for a positive relationship between board diversity and firm financial performance.

2.3.2 Resource dependency theory

Pfeffer and Salancik (1978) state that the purpose of a board is to link the organization to other external organizations to reduce environmental dependencies and obtain resources. Pfeffer and Salancik (1978) suggest several benefits for this external linkages namely, external linkage provides resources such as information and expertise, it creates external communication channels, it provides commitments of support from external organizations or groups and it creates legitimacy. According to Hillman, Cannella and Paetzold (2000), by selecting directors from diverse backgrounds and with various characteristics, a firm has better access to these four points which leads to better firm performance. Summarized, firms are dependent on the external environment and ultimately can benefit from their environment.

The resource dependency theory is used by many researchers since it offers a lot of clarity when it comes to the relationship of a firm with their environment. Terjesen et al. (2009) indicate that more diversity among the directors can provide beneficial resources. Liu et al. (2014) state that more women

on the board result in better communication to female customers and to women in the labor force and society. Additionally, the resource dependency theory states that gender diversity has a positive effect on firm performance, due to the extra links of women to external environment. Based on previous mentioned, this theory assumes a positive link between board diversity and financial performance.

2.3.3 Human capital theory

The human capital theory, formalized by Becker (1962), is often called the complementary theory to the resource dependency theory. Human capital refers to a person's education, experience and skills. The human capital theory states that the unique human capital of the members of the board can be used to the benefit of an organization (Kesner, 1988; Carter et al. 2010). The knowledge and skills of board members influence the effectiveness of the execution of the activities of the board.

Moreover, the human capital theory predicts that the performance of the board is influenced by gender diversity as a result of diverse and unique human capital (Terjesen et al., 2009). If human capital of directors is influenced by gender, it is reasonable to hypothesize that diversity based on age and nationality influences the human capital of the directors. Which, according to the theory, ultimately influences firm performance.

Concluding, according to Carter et al. (2010), the human capital theory predicts that board performance will be affected by board diversity as a result of diverse and unique human capital but the effect could be either positive or negative from a financial performance perspective.

2.3.4 Agency theory

The first sense-making introduction to the agency theory comes from Jensen and Meckling (1976). This study defines the agency relationship as: "a contract under which one or more person(s), being the principal(s), engage another person, the agent(s), to perform some service on their behalf which involves delegating some decision-making authority to the agent" (Jensen & Meckling, 1976). Eisenhardt (1989) defines agency theory as a problem that arises when desires of principals and agents conflict with each other. As Jensen and Meckling (1976) mentioned, agents are opportunistic and are motivated to take profit from information asymmetry in respect to the relationship with principals. This can result in conflicts between the principal and the agent, due to this conflict managers will not perform in the best interest of the shareholder. The consequence from this is costs arising from the conflict, because corporate managers will try to pursue own interests at the expense of shareholders. These costs lead to undesirable outcomes. It is thus clear that firms try to lower the possibility that agency conflicts can occur.

Board diversity increases the independence of board members which ultimately leads to a more active board. This is due to the fact that directors with different gender, ethnic or cultural background may ask different questions compared to those directors with more traditional backgrounds (Carter et al., 2003; Walt & Ingley, 2003). However, a different perspectives may not necessarily result in more effective

monitoring since diverse board members may be marginalized (Carter et al., 2003). Concluding, the agency theory does not provide a clear prediction concerning the link between board diversity and firm performance, however, the theory does not rule out this relationship either (Carter et al., 2003).

2.4 Board diversity characteristics

Researchers use varying indicators to measure board diversity. Gender, age, nationality, level of education, field of education, expertise and socioeconomic background are all used by researchers to investigate the relationship of board diversity and firm performance. Like mentioned in section 2.2, most research into board diversity focuses on observable diversity. This is due to the fact that non-observable characteristics are much more difficult to investigate. Similarly, this research will determine board diversity in terms of observable diversity.

Looking at the existing literature regarding observable diversity, the conclusion can be drawn that most studies investigate the effect of gender diversity (e.g. Campbell & Mínguez-Vera, 2008; Adams & Ferreira, 2009). Some studies examine board diversity by simultaneously taking various director characteristics into account (e.g. Carter et al., 2010; Erhardt et al., 2003). The indicators that are used in this research are the gender, age and nationality of the directors on the board. To better understand these characteristics and their effect on firm performance it is necessary to look at previous research. This section will use the existing literature to present different arguments to get better insights regarding the expected effect of board diversity in order to formulate the hypothesis as good as possible.

The remainder of this chapter will be based as follows. First, the possible effects of gender, age and nationality on firm performance will be formulated based on the existing literature. In addition, table 1 is presented to give an overview of the literature used in this research. Besides, the empirical evidence related to every board diversity characteristic will be presented and discussed. Next, the empirical evidence related to the gender quota will be presented. In the last part the hypothesis will be formulated.

2.4.1 Gender

In the literature concerning the effect of board diversity is gender diversity the most researched topic. Many studies investigated the effect of gender diversity and ethnic minorities simultaneous (e.g. Carter et al., 2003; Carter et al., 2010; Erhardt et al., 2003). Carter et al. (2003) examined the relationship between board diversity and firm value for Fortune 1000 firms. This study showed that the fraction of women directors and ethnic minorities on the board are positively influencing firm value. This study mentioned that females participate better because females are more curious than men. Besides, this study states that a more diversified board leads to better problem-solving and that more diversified boards are able to understand the market conditions better. Carter et al. (2010) examined the same relationship, however, this study could not find a significant relationship between gender or ethnic diversity on the board and the financial performance for a sample of major US corporations. Besides, this study states that from an agency perspective, gender diversity does not have a clarified relationship with a firm's

financial performance, but it does also not rule out the benefits. Carter et al. (2010) state that the effect of the gender and ethnic diversity of the board may be different under different circumstances at different times. Like mentioned before, Erhardt et al. (2003) also investigated the effect of demographic diversity on boards, based on women and ethnic minorities. This relationship is examined using 1993 and 1998 financial performance data for 127 large US companies. The results indicate that board diversity is positively associated with a firm's financial performance. Randøy et al. (2006) investigated the effect of three observable characteristics on the board, namely gender, age and nationality. This study investigated the 500 largest companies from Denmark, Norway and Sweden. They could not find a significant relationship between board diversity and firm performance.

Many research only focus on the effect of the presence of women on the board (e.g. Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Liu et al., 2014; Rose, 2007). Adams and Ferreira (2009) show that female directors have a substantial impact on board structure. However, the impact of gender diversity on firm performance depends on the corporate governance of the firm. According to Adams and Ferreira (2009), gender diversity is positively related to firm performance when the firm has a poor corporate governance. When a firm has strong corporate governance, the effect may decrease because of the possibility of over-monitoring due to the specific characteristics of women directors. This means that gender diversity can have both positive and negative effects on firm performance.

The study by Campbell and Mínguez-Vera (2008) assumes that the focus of firms should be on finding the right balance between women and men rather than simply the presence of women on the board. A panel data analysis of listed firms in Spain, a civil law country, during the period from 1995 to 2000 showed that that the presence of women on the board of directors does not, in itself, affect firm value. However, they find that the diversity of the board has a positive impact on firm value.

More women on the board means a more diversified board which in turn means more opinions and ways of thinking within a board. The effect of these different perspectives has been investigated by different authors. Liu et al. (2014) state that more women on the board result in better communication of an organization towards female customers and to women in the labor force and society. As women directors bring different perspectives and experiences into the board. However, Rose (2007) states that the decision process may take longer, due to the various perspectives that are being considered.

Some studies looked at the relationship of women directors and the image of a firm to external parties. Burgess and Tharenou (2002) conclude that female directors on the board improve the image of the firm and the relation with the stakeholders group. In addition, Terjesen et al. (2015) suggest that female directors send a more positive signal to the public regarding a firm's ethical behavior and hence conclude that firms with more female directors have better financial performance. This study analysed whether gender diversity enhances the board of directors' independence and efficiency. This research was based on more than 3800 firms located in 47 countries in 2010. Overall, their findings provide evidence that female directors increase effectiveness of the boards.

Studies have also been conducted into the effect of board diversity in the Netherlands (e.g. Marinova et al., 2016; Engelen et al., 2012; Lückerath-Rovers, 2013). Marinova et al. (2016) tested if board gender diversity would lead to better firm performance in the Netherlands and Denmark. This study found no relationship between the presence of women on boards and firm performance for their sample of 186 listed firms. Their study suggests that there is need for more empirical research due to the limited European evidence on the effect of board diversity and firm performance. Engelen et al. (2012) researched the relationship of board diversity on firm performance in the Netherlands during the crisis on the basis of seven dimensions (i.e. nationality, gender, level of education, field of education, expertise, socioeconomic background and age diversity). They found no impact of gender, nationality and education diversity on firm performance during crisis times. This study recommends firms not to focus on bringing in more women or more nationalities into the board. On the other hand, age, expertise and background diversity shows a hyperbolic relation with firm financial performance during the crisis. This hyperbolic appearance means that adding more diversity improves firm performance up to a maximum point. After this point increased diversity is disadvantageous for firm performance (Engelen et al., 2012). Summarizing, this study found a hyperbolic effect of age diversity on firm financial performance and gender and nationality diversity was not related to firm performance. Next, Lückerath-Rovers (2013) investigated the financial performance of 99 Dutch companies listed on the Amsterdam Euronext stock exchange. The results of this research show that firms with women directors perform better than those without women on their boards. This means, according to Lückerath-Rovers (2013) there is a positive effect of the presence of women on the financial performance of these firms.

Summarizing, many studies found a positive effect of gender diversity on firm performance (e.g. Carter et al., 2003; Erhardt et al., 2003; Campbell and Mínguez-Vera, 2008; Liu et al., 2014). Many arguments are provided by the researchers to substantiate the positive effect of gender diversity.

2.4.2 Age

A less investigated and exposed characteristic is the age of the board members and the effect of age diversity on firm performance. Horn and Cattell (1967) state that people of different ages possess unique types of knowledge and cognitive abilities. They also conclude that, in general, younger managers are more aware of technological developments and the applications of these technologies. According to Horn and Cattell (1967), this gives them an advantage over the older managers, which means that diversity in a board in terms of age should have a positive effect on firm performance. On the other hand, the human capital theory explains that older board members have developed more knowledge, skills and experiences that are beneficial for the firm and therefore these older members enhance firm performance. This is in accordance with Grund and Westergaard-Nielsen (2008), this study states that older people acquire mental skills that are assumed to improve with experience and learning. From the resource dependency theory perspective more age diversity should improve firm performance, since this theory concludes that a more diverse board results in better linkages with external environment.

Mahadeo et al. (2012) examined the benefits of diversity in terms of gender, age and educational background. They found a positive significant relationship for all three aspects. In addition, Mahadeo et al. (2012) indicate that directors from different ages have different backgrounds, networks and skills, which may lead to higher firm performance based on the resource dependency theory. Kim and Lim (2010) found a positive relationship between age diversity and firm valuation for 592 Korean firms. This results implies that higher aged directors bring more experience and this influences the firm valuation in a positive way.

Looking at the researches regarding age diversity of boards the conclusion can be drawn that the results vary. Mahadeo et al. (2012) and Kim and Lim (2010) found a positive effect of age diversity on firm performance. On the other hand, like mentioned earlier, Randøy et al. (2006) could not find any significant relationship between age diversity and firm performance.

2.4.3 Nationality

Many studies done to national diversity, focus on the presence of minorities in the board, for example by looking at African Americans and Asians in the board or making the distinction between non-white and white board members as a percentage of the total board (e.g. Carter et al., 2003; Erhardt et al., 2003; Richard, 2000). Carter et al. (2003) conclude that the fraction of minorities on board positively influences firm value. However, since the focus of this research is on Dutch companies and the effect of differences between managers within a board, it is of no added value to investigate these minorities like earlier mentioned researchers in the US did, since it can be assumed that the representation of these minorities is less in Dutch boards. Though the non-Dutch directors can be seen as the minority in this research in order to make this research useful for comparison.

Globalization forces firms to have a degree of knowledge regarding international markets. This international knowledge can be gathered by adding foreign directors to the board. As according to the resource dependency theory and the human capital theory these foreign board members bring other experiences, perspectives and especially other cultural backgrounds to a firm which ensures better linkages to external environment which should eventually lead to better decisions made by the board. Based on the agency theory nationality diversity has a positive impact on firm performance since firms with a more diverse board can reduce conflicts between agencies.

Since the single relationship of nationality diversity among the board of directors is not a much researched topic like gender, this section will be complemented by evidence from researches that have used nationality as a measurement for board diversity. Firstly, the results of researches will be mentioned that where mainly focused on the nationality. Complementary, the evidence of more broadly focused researches, such as research to both nationality and age or gender, will be presented. The existing literature uses several terms that have the same meaning in the context of these studies. The identity of the members is referred to as both ethnicity and nationality background but there is a major difference between these two terms. Nationality refers to the relationship between a person and the political state

to which he or she belongs or is affiliated, whereas ethnicity refers to the identification of a person with a particular racial, cultural or religious group. This research will use the nationality diversity and this data will be gathered based on the nationality of the person.

Richard (2000) examined the effect of cultural racial diversity on firm performance in the banking industry. This study found a positive effect for the 574 banks from California. Like mentioned before, Engelen et al. (2012) researched the relationship of board diversity based on seven dimensions. Nationality diversity was one of the investigated dimensions. They found no impact of nationality diversity on firm performance during the crisis in the Netherlands.

Summarizing, based on the studies done by Richard (2000) and Erhardt et al. (2003) it can be stated that national diversity on the board has a positive effect on firm performance. Engelen et al. (2012) could not find a significant effect for this relationship. Even though this part has been least investigated, a conclusion can be drawn regarding the effect of nationality diversity. The majority of the studies show a positive relationship between nationality diversity on board and firm performance.

Table 1. Empirical results overview

Author(s)	Sample	Investigated variables
Engelen et al.	2012 Netherlands	Gender (x), age (+) and nationality (x)
Van Overveld	2012 Netherlands	Gender (x) and age (x)
Lückerath-Rovers	2013 Netherlands	Gender (+)
Ten Dam	2018 Netherlands and United Kingdom	Gender (+), age (x) and nationality (+)
Marinova et al.	2016 Netherlands and Denmark	Gender (x)
Carter et al.	2010 United States	Gender (x) and nationality (x)
Carter et al.	2003 United States	Gender (+) and nationality (+)
Erhardt et al.	2003 United States	Gender (+) and nationality (+)
Adams & Ferreira	2009 United States	Gender (-)
Richard	2000 United States	Nationality (+)
Campbell & Mínguez-Vera	2008 Spain	Gender (+)
Randøy et al.	2006 Sweden, Norway and Denmark	Gender (x), age (x) and nationality (x)
Kim & Lim	2010 Korea	Age (+)
Mahadeo et al.	2012 Mauritius	Gender (+) and age (+)
Terjesen et al.	2015 47 countries	Gender (+)

Notes: this table presents an overview of the positive relationship (+), negative relationship (-), and no relationship (x) found from the empirical evidence that has been presented in the literature review.

2.5 Gender quota

The Dutch government will soon set a quota for all Dutch listed firms to have a board composition in which at least 30% of the members are women and at least 30% are men. In addition, all large Dutch firms must set appropriate and ambitious targets for gender diversity in their boards. The Netherlands is not the first country to apply this kind of quota. The fact that other European countries have preceded the Netherlands with this regulation makes it possible to look into evidence and effects from other countries.

Norway was the first country in Europe to introduce a mandatory quota, meaning that at least 40% of the board should be women directors. Norway implemented this quota in 2006. In 2006 15% of the directors on boards were women. Marinova et al. (2016) stated that in 2012 the number of female directors in Norway was 42%. This can be seen as an example of the results of the implementation of the quota. Based on earlier presented literature and assuming that more women on the board has a positive influence on firm's financial performance, an increase of women directors is beneficial for firms. In Sweden the threat of the quota entry led to an increase in the proportion of women at the top, which led to an increase of the profitability of the firms. Even though the quota was not executed, the quota has brought about a change in behavior among the firms. The threat of a quota led to a significant increase in the share of female board members and an improvement in the profitability of the companies involved.

However, there is also arguable evidence. Ahern and Dittmar (2012) examined the effect of the introduction of the gender quota in Norway. This study showed that the quota had led to a decrease in profitability. There was also a negative effect on operating results, which continued for several years. However, this result is not undisputed. Matsa and Miller (2013) also investigated the effect of the quota in Norway and compared firms that had to comply with the new regulation to firms that did not. For firms covered by the new regulation, layoffs decreased and labor costs rose. As a result, profitability declined. The effects were greatest for firms that had to appoint the most women to meet the legal requirement. In addition, Bøhren and Staubo (2016) state that the gender quota has some negative effects, such as a decrease in firm performance. Mandatory gender quotas achieve gender balance on boards, however, the negative effects should be taken into consideration.

Summarizing, the gender quota seems to have a positive effect on the presence of women directors on boards. Assuming that more women on board increase firm performance, the gender quota seems to increase the financial performance of firms. However, looking at the empirical evidence on this subject, the results show a negative effect of the gender quota on firm performance. This means that a conclusive effect of the gender quota on firm performance cannot be established.

2.6 Hypothesis development

Based on previous presented research and their suggestions of future research to further develop the evidence for this relationship, the hypothesis will be formulated in this section. Since three aspects will be used in this research to represent board diversity, namely age, gender and nationality, there will also be used three hypothesis. This is in line with Engelen et al. (2012), Erhardt et al. (2003), Mahadeo et al. (2012) and Lückcrath-Rovers (2013) who have also used these three aspects to measure board diversity.

The presented evidence in previous sections indicated that gender diversity affects the firm financial performance by making the board a better representation of society and improves decision making due to a more diverse input of human capital and linkage with environment. In addition, gender diversity enhances the image of the firm which is beneficial to shareholders. Besides, the empirical evidence show a positive relation of gender diversity on firm performance (e.g. Campbell & Mínguez-Vera, 2008; Carter et al., 2003; Erhardt et al., 2003 and Mahadeo et al., 2012). Based on these results, a positive relationship between gender diversity and firm performance is expected. Therefore, the following hypothesis can be formulated:

H1: Gender diversity on the board has a positive effect on firm performance.

Both the resource dependency theory and human capital theory suggest that a more diverse group based on age improves the human capital and the linkages of the group. This is due to more diverse directors based on age brings various behaviours, knowledge and experiences into the board. These improvements in human capital and linkages with environment are arguments for improvement of the firm performance. In addition, the empirical evidence shows a positive effect of age diversity on firm performance (e.g. Mahadeo et al., 2012; Kim & Lim, 2010). Based on the theories and the empirical results, a positive relationship between age diversity and firm performance is expected. Therefore, the following hypothesis can be formulated:

H2: Age diversity on the board has a positive effect on firm performance.

Since the resource dependency theory and human capital theory assume that a more diverse group bring more competences in a group that thereafter enhances firm performance, the expectation for the effect of nationality diversity on firm performance is positive. Based on empirical evidence regarding nationality diversity, a positive relationship is expected (e.g. Carter et al., 2003; Erhardt et al., 2003; Richard, 2000). Based on previous research and the expectations based on the theories, the following hypothesis can be formulated:

H3: Nationality diversity on the board has a positive effect on firm performance.

3 METHODOLOGY

This chapter gives insights in the research methods used in prior research and describes the advantages and disadvantages of these methods. Thereafter, the method used in this study will be described and substantiated with arguments. This chapter also includes an overview of the variables used in this research.

3.1 Methods used in prior research

3.1.1 OLS regression

The most commonly used estimation method in the board diversity literature is the ordinary least squares (OLS) regression (e.g. Adams & Ferreira, 2009; Ahern & Dittmar, 2012; Carter et al., 2010; Liu et al., 2014; Rose, 2007). OLS regression is a statistical technique, which can indicate the relationship between one or more independent variables and a dependent variable. This method estimates the relationship by minimizing the sum of the squares in the difference between the observed and predicted values of the dependent variables. The OLS regression method can be used for financial analysis and forecasting (Wooldridge, 2001).

The advantages of an OLS regression is that it is easy to interpret, gives a strongly grounded and clear relationship of variables and is simple analysable. However, there is also a disadvantage regarding this regression method, namely, the OLS regression does not account for endogeneity. Endogeneity can occur when the dependent variable is correlated with one or more independent variables. In this subject endogeneity between board diversity and firm performance can occur, since board diversity can lead to better firm performance, on the other hand, higher performing firms can realize more diversified boards (Liu et al., 2014). Low, Roberts and Whiting (2015) has dealt with endogeneity in their research and had insignificant results resulting from the OLS regression. However, not all studies to board diversity suffer from this, nevertheless if this method will be used endogeneity will be taken into account.

The OLS regression has some assumptions that have to be met before executing the regression. The first assumption is that all the variables are metric. The second assumption that has to be fulfilled is the sample size. To maintain sufficient statistical power, the regression needs a minimum sample size of 50 observations, but more observations is preferred. Other assumptions are concerning the linearity, normality and homoscedasticity. These assumptions can be checked based on the descriptive statistics. Data that do not meet the assumptions can be adjusted, by winsorizing and by using natural logarithms.

Summarizing, OLS regression is one of the most used research methods in investigating the influence of board diversity on firm performance. If all assumptions can be met, OLS regression is a proper method to use in this study. In case of assumptions that cannot be fulfilled, required adjustments will be made.

3.1.2 Fixed and random effects model

Many researchers in this subject used the fixed and random effects in their regression model (e.g. Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Liu et al., 2014; Rose, 2007). The fixed and random effects can help to control the presence of unobserved time- and firm-specific heterogeneity. Fixed effects are suitable to control for individual differences and is an appropriate method when the research is studying data that last for more than two periods. According to Gaur and Gaur (2006) the fixed effect regression tests variations among cross-sectional units simultaneously with variation within individuals over time. This means that the group means are fixed and each group mean is a group specific fixed variable that can be related to the dependent variable separately. An advantage of the fixed effects regression model is that fixed effects remove the effect of time-invariant characteristics, and because of this the net effect of the predictors on the outcome variable can be assessed (Adams & Ferreira, 2009; Liu et al., 2014; Low et al., 2015; Terjesen et al., 2015). A disadvantage of the fixed effects model is that it cannot be used in case of examining time invariant causes of the dependent variable.

The random effects regression model states that the parameters are random variables, different intercepts for different entities, and the intercepts being constant over time (Rose, 2007). The random effects model uses, in contrast to the fixed effects, variables that are all considered as random variables. The random effects model is suitable when there is no correlation between the fixed effects and the model variables and allows to obtain more efficient coefficients. The random effect model is useful for researchers when there are reasons to believe that there are differences between entities that have an impact on dependent variables. An advantage of the random effects regression model is that, in comparison to the fixed effects regression method, the random effects model is able to include time invariant variables. On the other hand, this method is not appropriate when the variables in the model are endogenous to each other which may create biased results.

3.1.3 2SLS regression

The two-stage least squares (2SLS) regression is a statistical estimation method that is used by various researchers (e.g. Campbell & Mínguez-Vera, 2008; Carter et al., 2003; Marinova et al., 2016). The 2SLS regression method is an extension of the OLS regression method. This method is useful when an endogeneity problem occurs (Marinova et al., 2016). Like mentioned before, endogeneity between board diversity and firm performance can occur, since board diversity can lead to better firm performance but higher performing firms can also realize more diversified boards. The 2SLS regression is an appropriate method to use in case of endogeneity problems, since this method uses a predictor of the independent variable which is not correlated with the dependent variable.

The 2SLS regression method tackles this endogeneity problem by adding instrument variables (IVs). According to Angrist and Imbens (1995), “instrument variables are variables related to the outcome of interest solely through the treatment of interest”. Instrument variables are used to determine the true correlation between the dependent and independent variable. Different types of instrument variables

have been used. Adams and Ferreira (2009) used the male directors that have connections to female directors. Terjesen et al. (2015) used various instruments, the fraction of independent and female directors on the board, the number of employees and the country's working women index. Lastly, Low et al. (2014) used the percentage of female directors.

The 2SLS regression method has also some disadvantages. First, Adams and Ferreira (2009) describe that "it is usually difficult to come up with valid instruments, because the factors that are arguably most correlated with the endogenous variable are other governance characteristics that are already (or should be) included in performance regressions, such as board size and independence". Second, it is hard to identify the right number of instrument variables that is needed for the research. Both fewer instrumental variables than needed as more instrument variables than needed is disadvantageous (Wooldridge, 2001).

3.2 Method used in this research

This study will use the OLS regression to investigate the relationship between board diversity and firm performance. Based on previous mentioned, the OLS regression is an appropriate method to use. This choice is based on a number of reasons. First, it is easy to interpret, gives a strongly grounded and clear relationship of variables and is simple analysable. Second, it is the most common used method in the board diversity literature. Looking at prior research it became clear that OLS is very often used to investigate the effect of board diversity on firm performance. Besides, this ensures more comparability between studies. Third, this study will study a dependence relationship between dependent variables and independent variables, which makes the OLS regression an appropriate method.

Like mentioned before, the OLS regression has some assumptions that have to be met before executing the regression. First, all variables should be metric, variables that are not metric will be made metric. Second, the sample size, as this research contains 181 observations this assumption will be met. Data that not meet the assumptions will be adjusted, by winsorizing and using natural logarithms.

However, like mentioned before, this regression method does not account for endogeneity. Since endogeneity between board diversity and firm performance can occur, this endogenous problem should be tackled. In order to mitigate the endogeneity problem, a lagged variable will be used as a robustness check. Besides, industry dummies will be included in the OLS regressions to control for industry influences on firm performance. This fixed effect examines group differences in intercepts and explores the relationship between predictor and outcome variables within an entity (e.g. country, individual or firm).

3.3 Model

As mentioned earlier in section 3.2, the data is examined through an OLS regression. The model is created based on the model used by Liu et al. (2014) and Marinova et al. (2016). They also used the OLS regression including fixed effects for industry. The β_0 is also known as the intercept or constant of the model. This represents the expected value for firm performance when all the independent variables

are zero. To test for each of the hypothesized relationships, gender diversity, age diversity and nationality diversity will be used as measures of board diversity. The independent variables will all be regressed separately against both ROA and Tobin's Q, as proxies of firm performance.

In these models the role of the control variables will be taken into consideration and therefore included in the models. The three control variables are in the model also known as β_2 (*control variables*). These variables are deemed to affect firm performance. The model also includes one fixed effect, this is for controlling industry specific influences (α_j) on firm performance. Finally, also the error term (ε_i) is included in the model, the error term stands for the degree of changes that cannot be explained by the presented variables in the models. Ultimately, the following OLS regression model will be used to answer the hypotheses:

$$Firm\ Performance_{it} = \beta_0 + \beta_1 (board\ diversity)_{it} + \beta_2 (control\ variables)_{it} + \alpha_j + \varepsilon_{it}$$

Where:

Firm Performance _{it}	=	measures of firm performance
β_0	=	constant or intercept
β_1 (board diversity) _{it}	=	estimated coefficient of board diversity
β_2 (control variables) _{it}	=	estimated coefficient of control variables
α_j	=	industry fixed effects to control industrial specific influences
ε_{it}	=	error term

3.4 Measurement of variables

This section will present all the variables that are used in this research to explain the relationship of board diversity with firm performance. The independent variables are the measures used as proxies for board diversity and the dependent variables are the measures used as proxies for firm performance. Additionally, the control variables will be presented and substantiated. At the end of this section the definitions and measurements of all the variables will be presented.

3.4.1 Independent variables

In order to achieve a reliable and measurable definition of board diversity, three independent variables are used. The independent variables are gender, age and nationality diversity. Gender diversity will be measured as the percentage of women on boards. The total amount of women on the boards will be divided by the total amount of board members. This is also done by Randøy et al. (2006) and Erhardt et al. (2003). Age diversity has been measured by many various ways. Some researchers used bands to categorize the ages of directors (e.g. Kim & Lim, 2010; Mahadeo et al., 2012), some used the Blau index method, like Darmadi (2011) did. Other researchers used the standard deviation or the average age of the board members (e.g. Randoy et al., 2006). In this research the coefficient of variation of age will be used to measure the diversity of age on a board. This is in line with other researchers (e.g. O'Reilly et

al., 1989). In this research age diversity is represented by the coefficient of variation which is calculated as the standard deviation (σ) of a firm's board age divided by the mean (μ) of its board age. Since the coefficient of variation is scale invariant, it is more preferable than standard deviation or variance when calculating the age diversity (Allison, 1978). The higher the CV, the higher the age diversity within the board of directors. This method is useful as it does not rely on the variation caused by the absolute size of the board, since the deviation is divided by the mean and therefore becomes a relative value. Lastly, nationality diversity will be measured as the percentage of people with nationalities other than Dutch on boards. The total amount of people with other nationalities will be divided by the total amount of board members, this is in accordance with Randøy et al. (2006) and Erhardt et al. (2003).

3.4.2 Dependent variables

The dependent variable of this research is firm performance. In the literature, researchers debate if stock market based measures such as Tobin's Q ratio and market return or accounting-based profitability measures such as return on assets, return on equity or return on sales are more appropriate proxies for the financial value of firms. On the one hand, it is argued that accounting-based measures are too sensitive to a firm's accounting system and accounting-based measures focus on the past or short term financial performance of a firm as it is based on the past and therefore reduce the explanatory power for future expectations (Rose, 2007). On the other hand, accounting-based measures are most common when measuring a firm's performance as they display the overall profitability of firms and its validity has been proven by empirical evidence to be related to economic returns. In contrast market-based measures focus on the future and reflect the expectations of the market for future earning and hence serves as a proxy for a firm's ability to create shareholder value as well as a firm's comparative advantage (Carter et al., 2010; Rose, 2007). Disregarding this debate, market-based as well as accounting-based measures for the financial performance of firms are widely accepted. Therefore, many different measures were used in empirical studies about board diversity and its impact on a firm's value, which makes it difficult to compare the results with each other. Thus, the analysis of this research make use of the most commonly used proxies in each domain for the purposes of comparison to other research results. Return on assets (ROA) as an accounting-based measure and Tobin's Q ratio as a market-based measure, in line with many researchers (e.g. Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Carter et al., 2010; Erhardt et al., 2003). ROA will be calculated by the earnings before interest and taxes divided by the value of total assets and the Tobin's Q will be calculated by the sum of the market value equity and the value of the total liabilities of the firm divided by the value of the total assets.

3.4.3 Control variables

Also three control variables will be used, to see if the relationship between board diversity and firm performance is not caused by some third variable. The control variables that will be used are firm size,

board size and leverage. These three variables are common used control variables in prior research and often have a significant effect on firm performance (Carter et al., 2003).

Leverage will be measured as debt divided by equity. The leverage ratio represents the financial risk of the firm. High leverage means the firm uses a lot of debt to finance activities. Low leverage means the firm uses more equity to finance activities. According to Campbell and Mínguez-Vera (2008), leverage and firm performance are positively related since debt efficiently reduces agency costs.

Firm size will be measured as the natural logarithm of the number of employees in the firm in the observed years. This will be based on a thousand euro ratio. According to Smith, Smith and Verner (2006), larger firms have larger profits since larger firms have more market power, therefore it is important to include this as a control variable.

Board size will be measured as the natural logarithm of the number of people on the board. According to the resource dependence theory, larger boards have been associated with better performing organizations since boards with more board members have more access to external resources. Therefore larger boards can make larger profits. That is why there is need for controlling the possible relationship between board size and firm performance.

3.5 Robustness check of results

This research will make use of some robustness checks of the results. The main goal of a robustness check is to make sure the conclusions of the research hold under different assumptions. Lu and White (2014) state that these robustness tests are included to decrease the possibility that results are based on chance. In accordance with previous research (e.g. Marinova et al., 2016; Low et al., 2015) this research will use return on equity (ROE) as an alternative measure of firm performance. The use of this third proxy for firm performance should decrease the possibility that results are based on coincidence. ROE is an accounting-based measure of firm performance and is measured by dividing the net income by total equity.

Besides this robustness check, there will be other robustness checks. Some dummies will be presented to execute the robustness check of results regarding the independent variables. The first will be a dummy for the presence of at least three women on a board, the second will be a age diversity dummy based on the method used by Mahadeo et al. (2012). Age bands will be used to judge the level of age diversity of the boards as a robustness check for the coefficient of variation. The members will be divided into six age bands, categorized in being younger than 34 years, being between 35 and 44 years, between 45 and 54 years, from 55 to 64 years, and being aged between 65 and 74 and members being older than 75 years. These age bands will be used to examine the dispersion of the members off each board depending on the amount of bands presented in each board. This means that the maximum dispersion of the boards will be presented as the value six and a board that consists of members being all in the same age band will be labelled with value one. In addition, a dummy will be created for the presence of at least three non-Dutch directors on the board.

Next, an additional control variable will be used as robustness check. This is the firm age based on the natural logarithm of the number of years since incorporation. Besides these checks there will be an additional robustness check by means of a subsample within the sample. The sample consists of 39% of firms in the manufacturing industry. There is chosen for this specific industry because of the size of this industry presented in the total sample. This industry will be used as a subsample to compute an extra robustness check of the results. Lastly, In order to mitigate the endogeneity problem, gender diversity will be lagged and hence be used as a robustness check. Besides, industry dummies will be included in the OLS regressions to control for industry influences on firm performance. Table 2 presents the definitions and measurements of all the variables used in this study.

Table 2. Variable measurement

Dependent variable		
Return on assets	ROA	Earnings before interest and taxes / total assets
Tobin's Q	TQ	(Market value equity + book value total debt) / total assets
Return on equity	ROE	Net income / total equity
Independent variable		
Gender diversity	GD	Number of women directors / total number of directors
Female directors	GD1	Dummy code equals 1 when at least three directors are women
Age diversity	AD	Standard deviation of board age / mean board age
Age bands	AD1	The number of age bands that are presented in a board
Nationality diversity	ND	Number of non-Dutch directors / total number of directors
Non-Dutch directors	ND1	Dummy code equals 1 when at least three directors are non-Dutch
Control variables		
Leverage	LEV	Long term debt / total assets
Firm size	L_FSIZE	Natural logarithm of the total assets
Board size	L_BSIZE	Natural logarithm of the total number of directors on the board
Firm age	L_FAGE	Natural logarithm of the number of years since incorporation
Fixed effect		
Financial	IND1	Dummy equals 1 when firm is operating in the financial sector
Manufacturing	IND2	Dummy equals 1 when firm is operating in the manufacturing sector
Wholesale, Retail and Trade	IND3	Dummy equals 1 when firm is operating in the wholesale, retail and trade sector
Information & Communication	IND4	Dummy equals 1 when firm is operating in the information communication sector

4 DATA

This section gives insights into the data and the way of obtaining the data will be presented. First the research sample will be presented and thereafter the way of data collection will be described.

4.1 Research sample

This research will investigate the effect of board diversity for 100 Dutch firms listed on the Euronext Amsterdam stock exchange for the years 2018 and 2019. The Euronext Amsterdam is one of the oldest financial trading exchanges in the world. The main indicators of the Amsterdam stock exchange are the Amsterdam Exchange Index (AEX) and the Amsterdam Midcap Index (AMX). The Euronext Amsterdam is part of the Euronext stock exchange company and in total there are 122 firms listed on this Amsterdam exchange. From the 122 firms 104 firms are domiciled in the Netherlands. Besides, firms that lack sufficient information will be excluded from the sample, for example firms that have missing board information or when there are is financial data available. Hence, 100 unique firms has been used in the sample. Like mentioned in table 4, out of 100 firms 81 firms had sufficient for both years. Which results in a total data sample of 181 observations. The sample selection process has been presented in table 3.

Table 3. Sample selection

Euronext Amsterdam	122
Statutory domicile in the Netherlands	104
Sufficient information for final sample	100

Table 4. Firms providing enough information per year

Year	2018	2019
Firms	100	81

The main source for financial data for this study is the ORBIS database. The ORBIS database contains combined information out of more than 150 different sources resulting in data of almost 200 million companies. It collects both financial and non-financial data. Collecting the data for the diversity variables will be gathered by hand. Annual reports contain information regarding the boards, which means that the gender, age and nationality characteristics will be gathered from these reports. This study investigates the years 2018 and 2019. There are several reason for using these years. First, in order to produce comparison material and a starting point for firms and the government with regard to the gender quota. Furthermore, the fact that this way of research is very time consuming and that these years have not been researched before. Looking at the existing literature, Marinova et al. (2016) investigated 102 firms in 2007, Lückerrath-Rovers (2013) investigated 99 firms in the Netherlands and Engelen et al. (2012) included a sample of 97 companies for 2009.

After collecting all the data, outliers should be detected and adjusted as outliers could lead to biases in the relationship between the dependent and independent variables. In order to detect these outliers, scatterplots and the explore function in SPSS will be used. Outliers will be replaced by adjusted values, by winsorizing the top and bottom of the sample with 2.5%.

5 RESULTS

In this chapter the results will be presented and an answer on the hypotheses will be formulated. First, the descriptive statistics will be presented. Thereafter, the Pearson's correlation matrix and the Variance Inflation Factor will be presented. Furthermore, the results regarding the hypothesis will be showed and the robustness check of results will be described.

5.1 Descriptive statistics

The descriptive statistics are presented in table 5. The number of observations, mean, median, standard deviation, the minimum values and maximum values are presented. The normal values of the log variables are presented, since logarithms do not provide representative descriptive information. The descriptive statistics including the outliers are presented in the appendices.

Table 5. Descriptive statistics

	N	Mean	Median	Std. Deviation	Minimum	Maximum
ROA	181	.024	.047	.114	-.446	.192
TQ	181	1.088	.745	1.160	.025	5.410
ROE	181	.164	.082	.518	-.750	1.240
GD	181	.203	.200	.134	0	.667
GD1	181	.243	.000	.430	0	1
AD	181	.116	.116	.045	.009	.264
AD1	181	2.940	3	.780	1	5
ND	181	.302	.300	.269	0	1
ND1	181	.464	.000	.500	0	1
LEV	181	.200	.142	.170	.004	.702
FSIZE_(x1000€)	181	9,034,544	1,093,746	17,996,137	1,338	69,721,000
BSIZE	181	8.385	8	3.425	3	18
FAGE_(years)	181	55.080	37	50.613	3	183
IND1	181	.166	0	.373	0	1
IND2	181	.392	0	.490	0	1
IND3	181	.050	0	.218	0	1
IND4	181	.144	0	.352	0	1

Table 5 presents the descriptive statistics which have been adjusted for outliers by using winsorization. Like visible in the table the values are much more normal distributed. Looking at the accounting-based indicators, an average ROA of 2.4% and a ROE of 16.4% is presented. This ROA percentage is in line with the ROA of ten Dam (2018), which also investigated the Dutch firms listed on the Euronext Amsterdam. The ROE is 16.4% which is lower than the ROE found by Lückcrath-Rovers (2013). This means that the ROA has remained the same in recent years, but that the ROE has decreased a lot since a few years. Looking at the market-based indicator Tobin's Q, a mean value of 1.088 is presented. Ten Dam (2018) showed a Tobin's Q of 1.402 which is higher. In addition, Carter et al.

(2010) and Adams and Ferreira (2009) both show a higher Tobin's Q. This means that compared to the literature the Tobin's Q decreased last years and this Tobin's Q is low compared to the US.

Looking at table 5 the conclusion can be drawn that the average of board gender diversity is 20.3%. This means that one out of five directors is a women. The gender diversity measured in the same way by ten Dam (2018) notes a percentage of 11.3, which is almost the half. This means that the last years the percentage of women on boards has almost doubled. This phenomenon, the big increase of women on boards, has started much earlier. Van Overveld (2012) investigated the Dutch listed firms for 2010 and he discovered a gender diversity among boards of only 6.3%. This means that the past 10 years the average women on the board has increased from 6.3% in 2010 to 11.3% in 2016 to 20.3% in 2018 and 2019. This is in line with the expectation, mainly due to the urgency associated with this situation, due to the emerging interests regarding parables in the labor market and key positions.

In this research age diversity is represented by the coefficient of variation which is calculated as the standard deviation of a firm's board age divided by the mean of its board age. This is also done by ten Dam (2018), which gives a good opportunity to compare these values. Looking at table 5, the age diversity and the dummy of age diversity tells us that the maximum dispersion based on the age bands is five with a minimum of one. This means that there are no boards that consists of members presented from all 6 age bands. During the data collection of this variable, it soon became clear that younger boards often had several young people and little or no older members, the same for older boards. Which explains the result of a maximum dispersion of five.

The diversity among the board regarding the nationality of the board members is 30.2%. This means that with a board of 10 members there are on average 7 Dutch and 3 non-Dutch members. In comparison to the research of ten Dam (2018), where the nationality diversity was a lower, namely 25.7%. This means that nationality diversity is increasing over the last years. This is also due to the upcoming interest and the urgency of this subject, to bring more diversity in to firms and especially into the boards.

5.2 Correlation analyses

Multicollinearity is a phenomenon or problem that variables are highly correlated with each other. This means that certain variables in the multiple regression model are linear related. This is a problem for the explanatory power of the regression analyses since there are some underlying correlations found between the variables which gives distorted results. A regression analysis with multicollinearity implies that redundant information is used in the model, which can easily lead to unstable regression coefficient estimates. To check the variables for multicollinearity, the Pearson's correlation matrix and the Variance Inflation Factor (VIF) will be examined.

5.2.1 Pearson's correlation matrix

The Pearson's correlation matrix gives an overview of the all the variables and their correlation coefficients with all the variables. In table 6 all the dependent, independent and control variables are

presented. According to Vithessonthi & Racela (2016), variables correlated higher than .7 are labelled as highly correlated and correlations below .3 will not create any issues.

Table 6. Pearson's correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 ROA													
2 TQ	-.218**												
3 ROE	.509**	-.002											
4 GD	.224**	-.229**	.171*										
5 GD1	.156*	-.093	.180*	.553**									
6 AD	.001	.035	.052	.152*	.013								
7 AD1	.051	-.033	.036	-.138	-.092	-.034							
8 ND	.002	.102	.068	.006	.280**	-.059	.031						
9 ND1	.086	.009	.105	.071	.402**	-.013	-.048	.822**					
10 LEV	-.103	.115	.002	.087	.047	-.041	.101	.139	.192**				
11 L_FSIZE	.359**	-.367**	.266**	.420**	.528**	.087	-.122	.260**	.415**	.016			
12 L_BSIZE	.249**	-.157*	.168*	.263**	.630**	-.027	-.138	.368**	.545**	.047	.642**		
13 L_FAGE	.152*	-.174*	.114	.356**	.311**	-.093	-.078	-.070	-.103	-.255**	.247**	.198**	

**Correlation is significant at the 0.01 level. *Correlation is significant at the 0.05 level.

The dependent variables ROA and ROE are correlated, with .509. This is not very striking, since these are two different variables that represent both firm performance. Tobin's Q and ROA are negative correlated, while Tobin's Q and ROE are not correlated.

The gender diversity variable is correlated with all three dependent variables. Gender diversity seems to be positively correlated with the accounting-based indicators ROA and ROE and negatively correlated with the market based indicator Tobin's Q. This means that more women on boards result in a higher ROA and ROE but a lower Tobin's Q. In addition, the gender diversity dummy is also positively correlated with the accounting-based indicators.

Age diversity and nationality diversity are both not correlated with the dependent variables. However, nationality diversity is correlated with the gender diversity dummy (.280**) and age diversity is correlated with gender diversity (.152*). Looking at these correlations it seems that boards with more women directors are also the boards with more diversity based on age and nationality.

Firm size and board size are both positively correlated with the accounting-based indicators ROA and ROE but negative correlated with Tobin's Q. This means that firms with larger boards or more employees have higher ROA and ROE than smaller firms. On the other hand, larger boards and larger firms seem to lead to lower Tobin's Q. Besides, firm size and board size are also positive correlated with gender diversity and nationality diversity. This means that larger firms and firms with larger boards are firms with more diversified boards based on gender and nationality. Lastly, firm size and board size are highly positive correlated, with .642. To ensure that this correlation will not cause problems in the regression analyses, these variables will be checked separately from each other.

5.2.2 Variance Inflation Factor

Variance Inflation Factor (VIF) has been used in order to check for multicollinearity between the independent variables. There is no approved VIF value for determining presence of multicollinearity, however, the rule of thumb of interpreting the VIF value states that 1 is not correlated, between 1 and 5 is moderately correlated and a value greater than 5 means a high correlation (Bennouri et al., 2018). After the execution of the VIF test for all the variables, the VIF values for this study range between 1.035 and 1.926. Concluding, all the values of the VIF test are beneath the high correlation value of 5, which means depending on the Variance Inflation Factor there will be no multicollinearity issues when examining the regression analyses for this research.

5.3 Regression analyses

In order to give an answer on the hypotheses, regression analyses will be executed. This subchapter contains the results of the regression analyses. After presenting the results, in section 5.4 the robustness check of results will be presented, subsequently a more concrete conclusion can be drawn, to finally reject or accept the hypothesis.

Next, some notes to the tables will be formulated to make them easier to interpret. First, industry dummies are included in all models to control for industry specific influences on firm performance. Furthermore, the adjusted R-squared is also mentioned in all the models, this shows the reliability of the correlation, how much is determined by the addition of independent variables. An increase in the adjusted R-squared interprets that the new term improves the model fit more than expected by chance alone. In addition, the F-statistic is presented in all the models. This statistic gives insights into the degree of satisfaction of the data sample, it checks whether the regression model fits the data better than the model with no independent variables. Besides, all the tables presented contain only the relevant models. Otiose figures and therefore nothing saying values for this research will therefore not be presented. In the evaluation of the results only the significant relations will be presented and discussed. Next, to answer the three hypothesis two different measures are used for firm performance. These measures are ROA and Tobin's Q. These measured will be both presented in one table, the first three models will be regarding the ROA and the last three models are presented based on the regarding effect on the Tobin's Q. In addition, in all the tables the control variables firm size and board size will be used both separately and simultaneously. This is done because of the high correlation, mentioned in the Pearson's correlation matrix, between these variables and the dependent variables. In addition to the presented regression analyses and selected models, many other regressions were executed but gave no significance. These regressions are not presented in order to avoid meaningless tables and models. The most powerful and meaningful models are chosen.

5.3.1 Gender diversity

This first section gives an answer on the first hypothesis regarding gender diversity. It states that gender diversity on boards positively affects firm performance. Gender diversity (GD) is measured by the percentage of women on the board and firm performance is measured by both return on assets (ROA) and Tobin's Q.

Model	ROA			Tobin's Q		
	(1)	(2)	(3)	(4)	(5)	(6)
GD	.076 (1.073)	.148** (2.322)	.077 (1.086)	-.896 (-1.209)	-2.218*** (-3.255)	-.898 (-1.217)
LEV	-.083* (-1.671)	-.079 (-1.628)	-.083* (-1.684)	.674 (1.294)	.937* (1.767)	.610 (1.173)
L_FSIZE	.031*** (3.743)		.027*** (2.705)	-.272** (-3.229)		-.356*** (-3.554)
L_BSIZE		.130*** (2.595)	.040 (.641)		-.383 (-.718)	.947 (1.534)
Constant	-.159*** (-3.239)	-.105** (-2.174)	-.174*** (-3.208)	2.488*** (5.111)	1.359*** (2.724)	2.135*** (3.979)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	.132	.090	.129	.140	.110	.147
F-statistic	4.726***	3.535***	4.172***	4.835***	4.063***	4.561***
Observations	181	181	181	181	181	181

Notes: All the regression models are controlled for industry effects. The dependent variable firm performance is measured by both return on assets; model 1, 2 and 3, and Tobin's Q; model 4, 5 and 6. Gender diversity (GD) is measured by the percentage of women directors on boards. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 7 shows no clear relationship between gender diversity and firm performance. Four out of six models show no significant relationship. For the first three models regarding ROA only model 2 shows significance and for the models based on Tobin's Q only model 5 shows significance. Although model 2 and 5 show a significant effect, this does not provide enough evidence to accept the hypothesis. Besides, the table shows a no consistent relationship between gender diversity and firm performance, model 2 shows a positive effect and model 5 shows a negative effect. In conclusion, based on all the models the conclusion can be drawn that gender diversity has no influence on firm performance.

The study of Lückérath-Rovers (2013) showed that more women on board leads to higher financial performances of the firm. This result cannot be justified based on table 7. However, the results from this table are in line with Marinova et al. (2016), Carter et al. (2010) and Randøy et al. (2006). All these studies could not provide evidence for a relationship between gender diversity and firm performance.

Looking at the significant models, both include board size and exclude firm size as control variables. This means that regarding the control variables the conclusion can be drawn that board size and firm size influence the relationship of gender diversity on firm performance. Firm size has an important role in the relationship of gender diversity and firm performance, as all models show a significant relationship. Firm size is positively influencing the ROA and negatively influencing Tobin's Q. This

means that larger firms have higher ROA but lower Tobin's Q compared to smaller firms. Looking at board size, the conclusion can be drawn that board size has less influence on the relationship of gender diversity and firm performance than firm size. Board size is positively related to ROA and not related to Tobin's Q. Leverage seems to have no great influence based on table 7. Leverage shows a significance of 10% on 3 models.

Summarizing, gender diversity has no relationship with firm performance based on table 7. Firm size positively influences ROA and negatively influences negatively influences Tobin's Q. The size of the boards shows no clear results, hence, board size has no influence on the effect of gender diversity on firm performance. Lastly, leverage has no noteworthy influence. These arguments are substantiated by multiple regressions, that are executed but not presented, that do not show any significance.

5.3.2 Age diversity

The second hypothesis states that age diversity on boards positively affects firm performance. Table 8 shows the relationship of age diversity (AD) with firm performance. Age diversity is measured by the coefficient of variation which is calculated as the standard deviation of a firm's board age divided by the mean of its board age.

Model	ROA			Tobin's Q		
	(1)	(2)	(3)	(4)	(5)	(6)
AD	-0.181 (-0.952)	-0.039 (-0.206)	-0.169 (-0.883)	3.596* (1.927)	1.327 (.673)	4.049** (2.167)
LEV	-0.081 (-1.640)	-0.073 (-1.479)	-0.082 (-1.646)	.748 (1.443)	.960* (1.753)	.682 (1.321)
L_FSIZE	.036 (4.930)		.033*** (3.544)	-.340*** (-4.820)		-.445*** (-4.939)
L_BSIZE		.161 (3.302)	.031 (.505)		-.933* (-1.793)	1.123* (1.821)
Constant	-.152*** (-2.936)	-.101* (-1.819)	-.165*** (-2.855)	2.271*** (4.502)	1.258** (2.144)	1.805*** (3.210)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	.130	.062	.126	.152	.056	.164
F-statistic	4.685***	2.688**	4.112***	5.223***	2.467***	5.051***
Observations	181	181	181	181	181	181

Notes: All the regression models are controlled for industry effects. The dependent variable firm performance is measured by both return on assets; model 1, 2 and 3, and Tobin's Q; model 4, 5 and 6. Age diversity (AD) is represented as the coefficient of variation which is calculated as the standard deviation of a firm's board age divided by the mean of its board age. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 8 shows no clear relationship between age diversity and firm performance. Four out of six models show no significant relationship. The models regarding ROA show no significance at all. However, looking at Tobin's Q the models 4 and 6 both show a positive significance effect of respectively 10% and 5%. The models 4 and 6 both include firm size as control variable. On the other hand, model 5 without firm size shows no significance. This indicates that the relationship of age diversity and Tobin's Q is being influenced by the size of the firm. Based on previous mentioned, age

diversity is not related to ROA of the firm but can positively affect Tobin's Q. However, including the evidence from other regressions that have been executed, but not presented, the conclusion can be drawn that there is not provided enough evidence to accept the hypothesis. Overall seen, this table does not show a relationship between age diversity and firm performance.

The study of Engelen et al. (2012) showed that more diversified boards based on age would lead to higher financial performance of firms in the Netherlands. This result cannot be justified based on table 8. However, the results from this table are in line with some theses (e.g. ten Dam, 2018; van Overveld, 2012). These studies could not provide evidence for a relationship between age diversity and firm performance.

Looking at the control variables the conclusion can be drawn that firm size has a role in the relationship of age diversity and firm performance, as most models show a significant relationship. Firm size is negatively influencing Tobin's Q. This means that larger firms have lower Tobin's Q compared to smaller firms. Leverage seems to have no great influence on the relationship between age diversity and firm performance.

Summarizing, age diversity has no relationship with firm performance based on ROA. But, age diversity could positively influence a firm's Tobin's Q. However, this argument cannot be substantiated, since many regressions, that have been executed but not presented, showed insignificant results. Based on above mentioned, the conclusions can be drawn that the hypothesis cannot be accepted. There is insufficient evidence to state that age diversity influences firm performance.

5.3.3 Nationality diversity

The last hypothesis states that nationality diversity on boards positively affects firm performance. Table 9 shows the relationship of nationality diversity (ND) with firm performance. Nationality diversity is measured as the amount of non-Dutch members on board divided by the total amount of board members.

Table 9 shows no clear relationship between nationality diversity and firm performance. Four out of six models show no significant relationship. Only the models 3 and 4 show some significance of 10%. Based on these results there is not enough evidence to accept the hypothesis that nationality diversity positively affects firm performance.

The results regarding the control variables firm size and board size are in line with the results presented earlier, in tables 7 and 8. Firm size is positively related to ROA and negatively related to Tobin's Q. And board size is positively related to ROA and negatively related to Tobin's Q. However, in line with previous presented tables, again firm size shows more significance than board size. This means that the size of the firms is more important than board size in controlling the relationship between diversity and firm performance. Leverage is not significant and is therefore not influencing the relationship between nationality diversity and firm performance.

Table 9: Nationality diversity on firm performance

Model	ROA			Tobin's Q		
	(1)	(2)	(3)	(4)	(5)	(6)
ND	-.047 (-1.383)	-.038 (-1.084)	-.061* (-1.705)	.609* (1.827)	.507 (1.384)	.494 (1.397)
LEV	-.073 (-1.470)	-.067 (-1.355)	-.072 (-1.459)	.523 (.997)	.813 (1.479)	.510 (.971)
L_FSIZE	.039*** (5.039)		.033*** (3.623)	-.373*** (-4.969)		-.421*** (-4.695)
L_BSIZE		.188*** (3.453)	.077 (1.172)		-1.285** (-2.247)	.642 (.983)
Constant	-.185*** (-3.794)	-.124** (-2.415)	-.218*** (-3.879)	2.820*** (5.942)	1.668*** (3.119)	2.549** (4.641)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	.136	.068	.138	.150	.064	.150
F-statistic	4.856***	2.867**	4.430***	5.158***	2.697***	4.633***
Observations	181	181	181	181	181	181

Notes: All the regression models are controlled for industry effects. The dependent variable firm performance is measured by both return on assets; model 1, 2 and 3, and Tobin's Q; model 4, 5 and 6. Nationality diversity (ND) is measured by the percentage of non-Dutch directors on boards. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

The studies of Carter et al. (2003) and Erhardt et al. (2003) both showed that more diversified boards based on nationality would lead to higher financial performance of firms. Though, this result cannot be justified based on table 9. However, the results from this table are in line with Carter et al. (2010) and Randøy et al. (2006). These studies could also not provide evidence for a relationship between nationality diversity and firm performance.

Summarizing, nationality diversity has no influence on firm performance. In addition to table 9, many regressions have been executed but not presented which also showed insignificant results. Based on all the above mentioned, the conclusions can be drawn that the hypothesis cannot be accepted. There is insufficient evidence to state that nationality diversity influences firm performance.

5.4 Robustness check

The regression analyses already include some robustness checks of results. This has been done by means of using two different indicators for firm performance. However, results show that there is no relationship between board diversity and firm performance. To test the robustness of the results, several robustness checks are executed. The use of these robustness checks should decrease the possibility that results are based on coincidence.

First, an additional accounting-based measurement for firm performance is used, namely the return on equity (ROE). Secondly, three dummies are used for the independent variables. The first is a dummy for the presence of at least three women on a board, the second dummy is used to re-examine the dispersion of age on the board. This is done by categorizing the members of the boards based on their age. There are created six age bands, like mentioned before, which are used thereafter to determine the degree of dispersion. Hence, the dispersion are presented in values between one and six, these values represent the number of age bands used per boardroom, in other words when a boards consists of seven members and their ages come from four different band ages, the dispersion of this board is four. The third dummy is a dummy for the presence of at least three non-Dutch members on the board. Next robustness check is a dummy for firm age measured by the natural logarithm of the number of years since incorporation. Next, there is an additional robustness check by means of a subsample within the sample. The subsample consists of all the firms in the manufacturing industry, this is 39% of the total data sample. The last robustness check is the replacement of the gender diversity variable with an one-year lagged gender diversity variable. This one-year lagged variable is used to control for endogeneity between board gender diversity and financial firm performance.

All the regression models presented in this section are based on insights of the writer. In this section only relevant results are checked and presented to avoid otiose results. To avoid redundant and meaningless information, two models are executed and presented per independent variable. Table 10 uses the two most significant models per independent variable to check them on ROE. Table 11, 12 and 13 presents for each independent variable both one related to ROA and one related to Tobin's Q.

Table 10 presents the robustness check of results based on an additional accounting-based indicator for firm performance, namely the return on equity. Looking at this table, the conclusion can be drawn that none of the diversity variables are related to ROE. Besides, firm size has a positive significant effect on ROE, this is line with the results of the other accounting-based measure ROA. Concluding, the results of the alternative measures are in line with the results based on ROA and Tobin's Q. This means that based on this test the hypotheses are not supported.

Table 10: Robustness check of results: dependent variable return on equity (ROE)						
Model	(1)	(2)	(3)	(4)	(5)	(6)
GD	.141 (1.503)	.042 (.401)				
AD			.070 (.251)	.080 (.284)		
ND					-.044 (-.886)	-.055 (.300)
LEV	-.018 (-.255)	-.034 (-.466)	-.031 (-.429)	-.032 (-.433)	-.026 (-.349)	-.025 (.732)
L_FSIZE		.039*** (2.61)	.043*** (4.015)	.040*** (2.957)	.047 (4.119)	.042*** (.002)
L_BSIZE	.156** (2.112)	.025 (.273)		.027 (.295)		.059 (.543)
Constant	-.107 (-1.501)	-.201** (-2.514)	-.206*** (-2.69)	-.217** (-2.541)	-.212*** (-2.937)	-.237*** (.005)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	.033	.069	.074	.068	.078	.074
F-statistic	1.866*	2.590**	2.951***	2.579**	3.067***	2.72***
Observations	181	181	181	181	181	181

Notes: All the regression models are controlled for industry effects. The dependent variable firm performance is measured return on equity (ROE). This is an additional accounting-based measurement for measuring firm performance. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 11 presents the robustness check of results based on three dummy variables related to ROA and Tobin's Q. The gender diversity shows no significance at all, although table 7 showed some significance. Besides, the age diversity dummy seems to have a positive relationship with ROA. This is a remarkable result, since table 8 shows no significance between the age diversity and ROA. However, this is at a significance level of 10% and the only significant relationship. Overall, this robustness check is in line with previous results.

Table 11: Robustness check of results: dummy variables						
Model	ROA			Tobin's Q		
	(1)	(2)	(3)	(4)	(5)	(6)
GD1	.008 (.314)			-.035 (-.132)		
AD1		.020* (1.812)			-.134 (-1.246)	
ND1			-.025 (-1.161)			.216 (1.146)
LEV	-.072 (-1.479)	-.090* (-1.822)	-.069 (-1.375)	.930* (1.707)	.682 (1.304)	.538 (1.004)
L_FSIZE		.032*** (3.572)	.033*** (3.577)		-.418*** (-4.659)	-.366*** (-4.643)
L_BSIZE	.149** (2.362)	.044 (.715)	.074 (1.073)	-.890 (-1.313)	.910 (1.473)	
Constant	-.097 (-1.649)	-.250*** (-3.922)	-.221*** (-3.601)	1.403** (2.254)	2.729*** (4.370)	2.839*** (5.716)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	.062	.140	.129	.054	.148	.139
F-statistic	2.697**	4.487***	4.197***	2.399**	4.572***	4.810***
Observations	181	181	181	181	181	181

Notes: All the regression models are controlled for industry effects. The dependent variable firm performance is measured by both return on assets; model 1, 2 and 3, and Tobin's Q; model 4, 5 and 6. Gender diversity dummy (GD1) equals 1 when at least three directors are women. Age diversity dummy (AD1) the value representing the age bands used per boardroom. Nationality diversity dummy (ND1) equals 1 when at least three directors are non-Dutch. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively

Table 12 shows the results of the robustness check of results based on an additional control variable. Table 12 shows the same relationship between gender diversity and firm performance, namely a positive effect on ROA and a strong negative effect on Tobin's Q. Age diversity seems to have no relationship with ROA and a strong positive effect on Tobin's Q, which is in line with previous results presented in table 8. Nationality shows also the same results after this robustness check. The negative relationship between nationality diversity and ROA does not hold after this robustness check. However, the positive effect on Tobin's Q has been supported after this robustness check. The results from previous tables hold for all the control variables. All the control variables show the same relationship and significance after this robustness check. Overall, the results of this robustness check are in line with previous results.

	ROA			Tobin's Q		
	(1)	(2)	(3)	(4)	(5)	(6)
GD	.141** (2.059)			-2.049*** (-2.767)		
AD		-.158 (-.813)			3.933** (2.082)	
ND			-.060 (-1.623)			.591* (1.741)
LEV	-.074 (-1.454)	-.076 (-1.460)	-.070 (-1.358)	.851 (1.545)	.619 (1.160)	.490 (.912)
L_FSIZE		.032*** (3.356)	.033*** (3.480)		-.435*** (-4.696)	-.365*** (-4.539)
L_BSIZE	.127** (2.509)	.029 (.472)	.075 (1.124)	-.342 (-.634)	1.142* (1.844)	
L_FAGE	.005 (.275)	.008 (.418)	.004 (.184)	-.120 (-.589)	-.088 (-.480)	-.056 (-.301)
Constant	-.111** (-2.101)	-.173*** (-2.841)	-.220*** (-3.831)	1.486*** (2.730)	1.887*** (3.205)	2.867*** (5.756)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	.085	.122	.132	.107	.160	.145
F-statistic	3.086***	3.656***	3.919***	3.585***	4.494***	4.499***
Observations	181	181	181	181	181	181

Notes: All the regression models are controlled for industry effects. The dependent variable firm performance is measured by both return on assets; model 1, 2 and 3, and Tobin's Q; model 4, 5 and 6. Gender diversity (GD) is measured by the percentage of women directors on boards. Age diversity (AD) is represented as the coefficient of variation which is calculated as the standard deviation of a firm's board age divided by the mean of its board age. Nationality diversity (ND) is measured by the percentage of non-Dutch directors on boards. Firm age is a logarithm of the number of years since incorporation. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

The next robustness check is based on a subsample with firms operating in the manufacturing industry. There has been chosen for this specific industry because of the size of this industry presented in the total sample. Researchers can choose for excluding the financial industry from the sample, since these firms seems to have more women on the board on average, but this did not lead to any significance. The total data sample contains for 39% of firms from the manufacturing industry and this industry did show a significance. For all the regression analysis in this research the industries has been specified into dummies. On the basis of this robustness check of results a conclusion will be drawn regarding this specific industry and there will be looked whether the results hold for this subsample without looking at the other industries. Table 13 shows that gender diversity is positively significant related to ROA, which is in line with previous results. For the rest of the table there are no significant relationships found between the independent and dependent variables.

	ROA			Tobin's Q		
	(1)	(2)	(3)	(4)	(5)	(6)
GD	.127* (1.680)			-1.356 (-1.261)		
AD		.528 (1.232)			3.598 (1.062)	
ND			-.087 (-1.009)			.809 (1.301)
LEV	-.045 (-.771)	-.073 (-.695)	-.047 (-.440)	1.549 (1.648)	-.165 (-.174)	-.333 (-.344)
L_FSIZE		.041** (2.080)	.054** (2.591)		-.442*** (-2.911)	-.404*** (-2.729)
L_BSIZE	.098* (1.619)	.020 (.146)	.051 (.356)	-.394 (-.403)	1.607 (1.460)	
Constant	-.076 (-1.378)	-.277** (-2.287)	-.299** (-2.211)	1.700** (1.995)	2.082** (2.160)	3.488*** (4.136)
Adjusted R ²	.029	.096	.088	.025	.072	.070
F-statistic	2.322*	2.663**	2.519*	1.579	2.168*	2.513*
Observations	71	71	71	71	71	71

Notes: The dependent variable firm performance is measured by both return on assets; model 1, 2 and 3, and Tobin's Q; model 4, 5 and 6. This is an additional accounting-based measurement for measuring firm performance. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

The last robustness check is the replacement of the gender diversity variable with an one-year lagged gender diversity variable related to ROA and Tobin's Q. This one-year lagged variable is used to control for endogeneity between board gender diversity and financial firm performance. Table 14 shows similar results as previous presented results. Model 5 is the only significant model. Table 7 shows significance for the models 2 and 5. However, overall seen, the results show the same results as earlier presented results based on gender diversity.

Model	ROA				Tobin's Q	
	(1)	(2)	(3)	(4)	(5)	(6)
GD(t-1)	.027 (.403)	.088 (1.374)	.026 (.376)	-.685 (-.909)	-2.010*** (-2.813)	-.752 (-1.001)
LEV	-.082 (-1.639)	-.078 (-1.602)	-.082 (-1.647)	.666 (1.274)	.891* (1.668)	.598 (1.148)
L_FSIZE	.034*** (4.265)		.030*** (3.158)	-.289*** (-3.504)		-.373*** (-3.818)
L_BSIZE		.143*** (2.831)	.037 (.595)		-.438 (-.812)	.980 (1.583)
Constant	-.167*** (3.428)	-.103** (-2.118)	-.181*** (-3.346)	2.537*** (5.232)	1.333*** (2.647)	2.161*** (4.018)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	.126	.072	.123	.137	.097	.145
F-statistic	4.558***	2.980***	4.017***	4.726***	3.641***	4.488***
Observations	181	181	181	181	181	181

Notes: All the regression models are controlled for industry effects. The dependent variable firm performance is measured by both return on assets; model 1, 2 and 3, and Tobin's Q; model 4, 5 and 6. The independent variable gender diversity is an one-year lagged variable. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

Concluding, all the robustness checks show the same results as earlier presented results. In fact, most of the models are insignificant. This means that gender diversity has no relationship with firm performance. Age diversity has a positive effect on Tobin's Q, however this result is limited, hence, this evidence is not enough to accept the age diversity hypothesis. Nationality diversity is not related to firm performance. In addition, the control variables show the same results. Firm size has influence on the relationship of board diversity and firm performance. Leverage has no influence on firm performance. Board size has no clear relationship with firm performance.

6 DISCUSSION AND CONCLUSION

The globalization of firms, the political promotion for equality at the workplace, the gender quota and a balanced reflection of the population are all important factors that greatly influence the interest in the effect of demographic board diversity on the performance of firms. The possible effect and its underlying thought are based on different theoretical arguments. According to Terjesen et al. (2009) and Carter et al. (2010) there is no single theory that predicts the nature of the relationship between board diversity and firm performance. The business case theory states that a greater firm's diversity is associated with a better understanding of the marketplace because more diverse competencies among the employees offer specific knowledge and understanding of different cultures. According to the resource dependency theory, a firm consists of many resources, namely all assets, capabilities, organizational processes, firm attributes, information and knowledge which all can be used to effectively implement value creating strategies (Barney, 1991). A firm with more diverse directors is more likely to have access to these various characteristics, which results in higher firm performance. The human capital theory states that board members bring unique human capital to the board, as they have different levels of education and other experiences (Kesner, 1988). Due to these various unique human capital, decision making can be improved. The agency theory does not provide a clear prediction about the relationship between board diversity and firm financial performance, but still considers that board diversity may be beneficial (Carter et al., 2003).

This study is relevant and contributes to the literature for several reasons. First, to contribute to the limited European and especially limited Dutch evidence on board diversity and firm performance as until now most empirical research has focused on US companies. In addition, to contribute to the limited evidence on the three different board diversity characteristics gender, age and nationality. Since all three dimensions are examined separately, this study has the ability to draw conclusions regarding their individual effect on firm performance. Besides, this study can be used, by the Dutch government and firms, as a starting point or as comparison material for further studies once the gender quota has been set, since it is certain that in the near future the gender quota will be introduced in the Netherlands.

The aim of this study is to investigate the effect of board diversity on firm performance of 100 Dutch firms listed on the Euronext Amsterdam for the years 2018 and 2019. Firm performance is measured by ROA, ROE and Tobin's Q. The board diversity characteristics that are examined are gender diversity, age diversity and nationality diversity. In order to answer the research question, there are formulated three hypotheses. To answer the hypotheses, OLS regression with industry fixed effects is performed.

First, there is no relationship found between gender diversity and firm performance. The results show limited evidence for a positive relationship between gender diversity and Tobin's Q. However, based on all the other regression, there is not enough evidence to conclude that there is a positive relationship between gender diversity and firm performance. Therefore, the first hypothesis, which states that gender diversity is positively related to firm performance, is not supported.

The second hypothesis checked in this research is regarding the age diversity. There is no relationship found between age diversity and firm performance. The results show limited evidence for the relationship between age diversity and Tobin's Q. Although the robustness check of results show a positive relationship between the dummy and ROA, the overall conclusion is that age diversity has no influence on firm performance. This means that the hypothesis, which states that age diversity is positively related to firm performance, is not supported.

The third board diversity indicator is nationality diversity. The results show that there is no effect of nationality diversity on ROA and Tobin's Q. Therefore, the hypothesis, which states that nationality diversity is positively related to firm performance, is not supported.

In addition, the conclusion can be drawn that firm size has an influence on firm performance. However, firm size shows to be positively related to ROA and negatively related to Tobin's Q. Board size shows the same relationship, but to a less significant level. This means that larger firms have higher ROA than smaller firms but a lower Tobin's Q than smaller firms. Furthermore, leverage is not related to a firm's performance.

In conclusion, the diversity on boards does not influence the financial performance of Dutch firms. This means that this study does not indicate firms to diversify the board of directors in order to expect higher firm performance. However, there is also no reason to suggest that it has a negative effect. This research cannot find a relationship between board diversity and firm performance. The fact that there is no evidence to accept the hypotheses may be due to the sample that have been used. A possible cause could be that the data sample is too small.

This research faces a few limitations. As mentioned earlier, endogeneity could be a problem when investigating the relationship between board diversity and firm performance. Endogeneity can occur since board diversity can lead to better firm performance but higher performing firms can realize more diversified boards also. This study used an OLS regression, which does not take endogeneity into account. Nevertheless, in order to solve this problem, a one-year lag variable of gender diversity is used as a robustness check of results. However, for further research on this subject, it is recommended to use the 2SLS regression method to control for endogeneity.

The second limitation is that this study does not take experience and education into account. Every female director brings different experiences into the board. Further research should not only focus on the characteristics gender, age and nationality but also on other characteristics, such as experience and education. Based on these results, a clearer conclusion could be drawn regarding the effect of women on boards.

The third limitation is that this study did not take the roles of the woman on boards into account. According to Miller and Triana (2009), women directors often fulfill less influential roles, therefore it is hard for women to influence decisions made by the board. This study investigated the boards as an one-tier board instead of looking what the function is of the individual directors. Therefore, investigation to the influence of executive and non-executive directors can be beneficial for future research.

The fourth limitation is regarding the data sample that is used. First, a larger sample size could possibly provide better results. Besides, a larger sample size probably would result in a higher reliability and validity of the results. Second, the sample consists of only listed firms on the Euronext Amsterdam, this means that the sample consists out of mostly large firms. Using a sample that consists out of small, medium and large firms is beneficial in order to make the findings more generalizable to smaller firms.

REFERENCES

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.

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.

Ahern, K. R., & Dittmar, A. K. (2012). The changing of the boards: The impact on firm valuation of mandated female board representation. *The Quarterly Journal of Economics*, 127(1), 137-197.

Allison, P. D. (1978). Measures of inequality. *American Sociological Review*, 865-880.

Angrist, J. D., & Imbens, G. W. (1995). Two-stage least squares estimation of average causal effects in models with variable treatment intensity. *Journal of the American statistical Association*, 90(430), 431-442.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy*, 70(5, Part 2), 9-49.

Böhren, Ø., & Staubo, S. (2016). Mandatory gender balance and board independence. *European Financial Management*, 22(1), 3-30.

Burgess, Z., & Tharenou, P. (2002). Women board directors: Characteristics of the few. *Journal of Business Ethics*, 37(1), 39-49.

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.

Cox, T. H., & Blake, S. (1991). Managing cultural diversity: Implications for organizational competitiveness. *Academy of Management Perspectives*, 5(3), 45-56.

Darmadi, S. (2011). Board diversity and firm performance: The Indonesian evidence. *Corporate Ownership and Control Journal*, 8, 258

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14(1), 57-74.

Engelen, P. J., van den Berg, A., & van der Laan, G. (2012). Board diversity as a shield during the financial crisis. In *Corporate governance* (pp. 259-285). Springer, Berlin, Heidelberg.

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.

Gaur, A. S., & Gaur, S. S. (2006). *Statistical methods for practice and research: A guide to data analysis using SPSS*. Sage.

Gillan, S., & Starks, L. T. (1998). A survey of shareholder activism: Motivation and empirical evidence. *Contemporary Finance Digest*, (October 1998), 10–34.

Grund, C., & Westergaard-Nielsen, N. (2008). Age structure of the workforce and firm performance. *International Journal of Manpower*.

Gupta, A. K., & Govindarajan, V. (2002). Cultivating a global mindset. *Academy of Management Perspectives*, 16(1), 116-126.

Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37(2), 235-256.

Horn, J. L., & Cattell, R. B. (1967). Age differences in fluid and crystallized intelligence. *Acta Psychologica*, 26, 107-129.

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.

Kesner, I. F. (1988). Directors' characteristics and committee membership: An investigation of type, occupation, tenure, and gender. *Academy of Management Journal*, 31(1), 66-84.

Kim, H., & Lim, C. (2010). Diversity, outside directors and firm valuation: Korean evidence. *Journal of Business Research*, 63(3), 284-291.

Liu, Y., Wei, Z., & Xie, F. (2014). Do women directors improve firm performance in China? *Journal of Corporate Finance*, 28, 169-184.

Low, D. C., Roberts, H., & Whiting, R. H. (2015). Board gender diversity and firm performance: Empirical evidence from Hong Kong, South Korea, Malaysia and Singapore. *Pacific-Basin Finance Journal*, 35, 381-401.

Lückerath-Rovers, M. (2013). Women on boards and firm performance. *Journal of Management and Governance*, 17(2), 491-509.

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.

Marinova, J., Plantenga, J., & Remery, C. (2016). Gender diversity and firm performance: Evidence from Dutch and Danish boardrooms. *The International Journal of Human Resource Management*, 27(15), 1777-1790.

Matsa, D. A., & Miller, A. R. (2013). A female style in corporate leadership? Evidence from quotas. *American Economic Journal: Applied Economics*, 5(3), 136-69.

Miller, T., & Triana, M. del C. (2009). Demographic diversity in the boardroom: Mediators of the board diversity-firm performance relationship. *Journal of Management Studies*, 46(5), 755–786.

O'Reilly, C. A., Caldwell, D. F., & Barnett, W. P. (1989). Work group demography, social integration, and turnover. *Administrative Science Quarterly*, 21-37.

Randøy, T., Thomsen, S., & Oxelheim, L. (2006). A Nordic perspective on corporate board diversity. *Age*, 390(0.5428), 1-26.

Richard, O. C. (2000). Racial diversity, business strategy, and firm performance: A resource-based view. *Academy of Management Journal*, 43(2), 164-177.

Robinson, G., & Dechant, K. (1997). Building a business case for diversity. *Academy of Management Perspectives*, 11(3), 21-31.

Rose, C. (2007). Does female board representation influence firm performance? The Danish evidence. *Corporate Governance: An International Review*, 15(2), 404-413.

Salancik, G. R., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative Science Quarterly*, 224-253.

Smith, N., Smith, V., & Verner, M. (2006). Do women in top management affect firm performance? A panel study of 2,500 Danish firms. *International Journal of productivity and Performance management*.

Ten Dam, J. (2018). The influence of board diversity on firm's financial performance: A comparison between firms from the Netherlands and the United Kingdom.

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.

Terjesen, S., Aguilera, R.V., Lorenz, R.J. (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.

Van der Walt, N., & 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.

Van Overveld, M. N. J. (2012). Board diversity and financial firm performance in Dutch listed firms.

Vithessonthi, C., & Racela, O. C. (2016). Short-and long-run effects of internationalization and R&D intensity on firm performance. *Journal of Multinational Financial Management*, 34, 28-45.

Williams, K. Y., & O'Reilly, C. A. (1998). Demography and diversity in organizations. *Research in Organizational Behavior*, 20, 77-140.

Wooldridge, J. M. (2001). Applications of generalized method of moments estimation. *Journal of Economic perspectives*, 15(4), 87-100.

APPENDICES

Appendix A : List of firms used in this study

AALBERTS N.V.	KEMPEN EUROPEAN PROPERTY FUND N.V.
ABN AMRO BANK NV	KENDRION N.V.
ACCELL GROUP NV	KIADIS PHARMA N.V.
ADYEN N.V	KONINKLIJKE AHOLD DELHAIZE N.V.
AEGON NV	KONINKLIJKE BAM GROEP NV
AFC AJAX NV	KONINKLIJKE BOSKALIS WESTMINSTER NV
AKZO NOBEL NV	KONINKLIJKE BRILL NV
ALFEN N.V.	KONINKLIJKE DSM N.V.
ALTICE EUROPE N.V.	KONINKLIJKE KPN NV
ALUMEXX N.V.	KONINKLIJKE PHILIPS N.V.
AMG ADVANCED METALLURGICAL GROUP N.V.	KONINKLIJKE VOPAK N.V.
AMSTERDAM COMMODITIES N.V.	LAVIDE HOLDING N.V.
AND INTERNATIONAL PUBLISHERS NV	LSP LIFE SCIENCES FUND N.V.
ARCADIS NV	LUCAS BOLS N.V
ARCONA PROPERTY FUND N.V.	MKB NEDSENSE N.V.
ASM INTERNATIONAL NV	N.V. KONINKLIJKE PORCELEYNE FLES
ASML HOLDING N.V.	NEDERLANDSCHE APPARATENFABRIEK 'NEDAP' N.V.
ASR NEDERLAND NV	NEDERLANDSE BELEGGINGSMAATSCHAPPIJ VOOR ZEESCHEPEN
AVANTIUM N.V.	NEW SOURCES ENERGY N.V.
BASIC-FIT N.V.	NEWAYS ELECTRONICS INTERNATIONAL NV
BE SEMICONDUCTOR INDUSTRIES N.V.	NIBC HOLDING NV
BETER BED HOLDING NV	NN EQUITY INVESTMENT FUND N.V.
BEVER HOLDING NV	NN GROUP NV
BRUNEL INTERNATIONAL NV	NOVISOURCE N.V.
C/TAC NV	NSI N.V.
CM.COM N.V.	OCI N.V
CORBION N.V.	ORANJEWOUD N.V.
DGB GROUP N.V.	ORDINA NV
DPA GROUP N.V.	PHARMING GROUP NV
EASE2PAY N.V.	POSTNL N.V.
ENVIPCO HOLDING N.V.	PROSUS N.V.
EUROCOMMERCIAL PROPERTIES N.V.	RANDSTAD NV
FASTNED B.V.	ROBECO GLOBAL STARS EQUITIES FUND N.V.
FLOW TRADERS NV	ROLINCO N.V.
FORFARMERS N.V.	ROODMICROTEC N.V.
FUGRO NV	SBM OFFSHORE N.V.
GRANDVISION N.V	SIF HOLDING N.V.
HEIJMANS NV	SIGNIFY N.V.
HEINEKEN HOLDING NV	SLIGRO FOOD GROUP N.V.
HEINEKEN NV	SNOWWORLD N.V.
HOLLAND COLOURS NV	STERN GROEP NV
HYDRATEC INDUSTRIES N.V.	TIE KINETIX N.V.
ICT GROUP N.V.	TKH GROUP N.V.
IEX GROUP N.V.	TOMTOM NV
IMCD N.V.	UNILEVER NV
ING GROEP NV	VALUE8 NV
INTERTRUST N.V.	VAN LANSCHOT KEMPEN NV
JUST EAT TAKEAWAY.COM N.V.	VASTNED RETAIL N.V.
KARDAN N.V.	WERELDHAVE NV
KEMPEN EUROPEAN HIGH DIVIDEND FUND N.V.	WOLTERS KLUWER NV

Appendix B : Descriptive statistics including outliers

	N	Mean	Median	Std. Deviation	Minimum	Maximum
ROA	181	.010	.047	.201	-1.503	.270
TQ	181	1.079	.730	1.301	.002	8.380
ROE	181	.137	.082	.977	-8.325	5.189
GD	181	.203	.200	.134	0	.667
GD1	181	.243	.000	.430	0	1
AD	181	.116	.116	.045	.009	.264
AD1	181	2.940	3	.780	1	5
ND	181	.302	.300	.269	0	1
ND1	181	.464	.000	.500	0	1
LEV	181	.200	.142	.170	.001	.702
FSIZE	181	27.180.123	1.093.746	111.297.792	67	591.744.000
BSIZE	181	8.425	8	3.572	2	21
FAGE	181	58.602	37	62.693	2	336
IND1	181	.166	0	.373	0	1
IND2	181	.392	0	.490	0	1
IND3	181	.050	0	.218	0	1
IND4	181	.144	0	.352	0	1

Appendix C : Additional regression analyses of gender diversity on ROA and Tobin's Q

ROA	1	2	3	4	5
Constant	-1.185*** (-3.486)	.006 (.275)	-1.159*** (-3.239)	-.105** (-2.174)	-.174*** (-3.208)
GD		.193*** (3.106)	.076 (1.073)	.148** (2.322)	.077 (1.086)
LEV	-.080 (-1.620)	-.072 (-1.464)	-.083* (-1.671)	-.079 (-1.628)	-.083* (-1.684)
L_FSIZE	.031*** (3.45)		.031*** (3.743)		.027*** (2.705)
L_BSIZE	.038 (.614)			.13*** (2.595)	.04 (.641)
Industry	Yes	Yes	Yes	Yes	Yes
Adjusted R2	.128	.060	.132	.900	.129
F-statistic	4.595***	2.906***	4.726***	3.535***	4.172***
Observations	181	181	181	181	181

TQ	1	2	3	4	5
Constant	2.298*** (4.414)	1.042*** (4.490)	2.488*** (5.111)	1.359*** (2.724)	2.135*** (3.979)
GD		-2.377*** (-3.695)	-0.896 (-1.209)	-2.218*** (-3.255)	-0.898 (-1.217)
LEV	0.615 (1.181)	0.885* (1.688)	0.674 (1.294)	0.937* (1.767)	0.61 (1.173)
L_FSIZE	-0.411*** (-4.582)		-0.272** (-3.229)		-0.356*** (-3.554)
L_BSIZE	0.945 (1.529)			-0.383 (-0.718)	0.947 (1.534)
Industry	Yes	Yes	Yes	Yes	Yes
Adjusted R2	0.145	0.113	0.14	0.11	0.147
F-statistic	4.986***	4.668***	4.835***	4.063***	4.561***
Observations	181	181	181	181	181

Appendix D : Additional regression analyses of age diversity on ROA and Tobin's Q

ROA	1	2	3	4	5
Constant	-.185*** (-3.486)	.050 (1.550)	-.152*** (-2.936)	-.101* (-1.819)	-.165*** (-2.855)
AD		-.062 (-.318)	-.181 (-.952)	-.039 (-.206)	-.169 (-.883)
LEV	-.080 (-1.62)	-.061 (-1.211)	-.081 (-1.64)	-.073 (-1.479)	-.082 (-1.646)
L_FSIZE	.031*** (3.45)		.036 (4.930)		.033*** (3.544)
L_BSIZE	.038 (.614)			.161 (3.302)	.031 (.505)
Industry	Yes	Yes	Yes	Yes	Yes
Adjusted R2	.128	.008	.130	.062	.126
F-statistic	4.595***	1.248	4.685***	2.688**	4.112***
Observations	181	181	181	181	181

TQ	1	2	3	4	5
Constant	2.298*** (4.414)	.392 (1.169)	2.271*** (4.502)	1.258** (2.144)	1.805*** (3.210)
AD		1.481 (.747)	3.596* (1.927)	1.327 (.673)	4.049** (2.167)
LEV	.615 (1.181)	.821 (1.505)	.748 (1.443)	.960* (1.753)	.682 (1.321)
L_FSIZE	-.411*** (-4.582)		-.34*** (-4.820)		-.445*** (-4.939)
L_BSIZE	.945 (1.529)			-.933* (-1.793)	1.123* (1.821)
Industry	Yes	Yes	Yes	Yes	Yes
Adjusted R2	.145	.044	.152	.056	.164
F-statistic	4.986***	2.312**	5.223***	2.467***	5.051***
Observations	181	181	181	181	181

Appendix E : Additional regression analyses of nationality diversity on ROA and Tobin's Q

ROA	1	2	3	4	5
Constant	-1.185*** (-3.486)	.039* (1.848)	-1.185*** (-3.794)	-.124** (-2.415)	-.218*** (-3.879)
ND		.017 (0.523)	-.047 (-1.383)	-.038 (-1.084)	-.061* (-1.705)
LEV	-.080 (-1.620)	-.063 (-1.250)	-.073 (-1.470)	-.067 (-1.355)	-.072 (-1.459)
L_FSIZE	.031*** (3.450)		.039*** (5.039)		.033*** (3.623)
L_BSIZE	.038 (.614)			.188*** (3.453)	.077 (1.172)
Industry	Yes	Yes	Yes	Yes	Yes
Adjusted R2	.128	.009	.136	.068	.138
F-statistic	4.595***	1.278	4.856***	2.867**	4.430***
Observations	181	181	181	181	181

TQ	1	2	3	4	5
Constant	2.298*** (4.414)	.563*** (2.645)	2.82*** (5.942)	1.668*** (3.119)	2.549*** (4.641)
ND		.156 (.466)	.609* (1.827)	.507 (1.384)	.494 (1.397)
LEV	.615 (1.181)	.732 (1.319)	.523 (.997)	.813 (1.479)	.510 (.971)
L_FSIZE	-.411*** (-4.582)		-.373*** (-4.969)		-.421*** (-4.695)
L_BSIZE	.945 (1.529)			-1.285** (-2.247)	.642 (.983)
Industry	Yes	Yes	Yes	Yes	Yes
Adjusted R2	.145	.042	0.15	.064	.150
F-statistic	4.986***	2.251*	5.158***	2.697***	4.633***
Observations	181	181	181	181	181

Appendix F : Overview of regression analyses based on all three indicators of firm performance

Model	ROA			Tobin's Q			ROE		
	1	2	3	4	5	6	7	8	9
Constant	-.159*** (-3.239)	-.105** (-2.174)	-.174*** (-3.208)	2.488*** (-5.111)	1.359*** (-2.724)	2.135*** (-3.979)	-.192*** (-2.646)	-.107 (-1.501)	-.201** (-2.514)
GD	.076 (-1.073)	.148** (-2.322)	.077 (-1.086)	-.896 (-1.209)	-2.218*** (-3.255)	-.898 (-1.217)	.041 (.395)	.141 (1.503)	.042 (.401)
LEV	-.083* (-1.671)	-.079 (-1.628)	-.083* (-1.684)	.674 (-1.294)	.937* (-1.767)	.610 (-1.173)	-.034 (-.461)	-.018 (-.255)	-.034 (-.466)
L_FSIZE	.031*** (-3.743)		.027*** (-2.705)	-.272** (-3.229)		-.356*** (-3.554)	.041*** (3.376)		.039*** (2.610)
L_BSIZE		.130*** (-2.595)	.040 (.641)		-.383 (-.718)	.947 (-1.534)		.156** (2.112)	.025 (.273)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R2	.132	.900	.129	.140	.110	.147	.074	.033	.069
F-statistic	4.726***	3.535***	4.172***	4.835***	4.063***	4.561***	2.966***	1.866*	2.590**
Observations	181	181	181	181	181	181	181	181	181

Model	ROA			Tobin's Q			ROE		
	1	2	3	4	5	6	7	8	9
Constant	-.152*** (-2.936)	-.101* (-1.819)	-.165*** (-2.855)	2.271*** (-4.502)	1.258** (-2.144)	1.805*** (-3.210)	-.206*** (-2.690)	-.135* (-1.659)	-.217** (-2.541)
AD	-.181 (-.952)	-.039 (-.206)	-.169 (-.883)	3.596* (-1.927)	1.327 (.673)	4.049** (-2.167)	.070 (.251)	.187 (.679)	.080 (.284)
LEV	-.081 (-1.640)	-.073 (-1.479)	-.082 (-1.646)	.748 (-1.443)	.960* (-1.753)	.682 (-1.321)	-.031 (-.429)	-.009 (-.124)	-.032 (-.433)
L_FSIZE	.036 (-4.930)		.033*** (-3.544)	-.340*** (-4.820)		-.445*** (-4.939)	.043*** (4.015)		.040*** (2.957)
L_BSIZE		.161 (-3.302)	.031 (.505)		-.933* (-1.793)	1.123* (-1.821)		.188*** (2.635)	.027 (0.295)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R2	.130	.062	.126	.152	.056	.164	.074	.023	.068
F-statistic	4.685***	2.688**	4.112***	5.223***	2.467***	5.051***	2.951***	1.593	2.579**
Observations	181	181	181	181	181	181	181	181	181

Model	ROA			Tobin's Q			ROE		
	1	2	3	4	5	6	7	8	9
Constant	-.185*** (-3.794)	-.124** (-2.415)	-.218*** (-3.879)	2.820*** (5.942)	1.668*** (-3.119)	2.549** (-4.641)	-.212*** (-2.937)	-.117 (-1.552)	-.237*** (.005)
ND	-.047 (-1.383)	-.038 (-1.084)	-.061* (-1.705)	.609* (-1.827)	.507 (-1.384)	.494 (-1.397)	-.044 (-.886)	-.018 (-.352)	-.055 (.300)
LEV	-.073 (-1.470)	-.067 (-1.355)	-.072 (-1.459)	.523 (.997)	.813 (-1.479)	.510 (.971)	-.026 (-.349)	-.009 (-.127)	-.025 (.732)
L_SIZE	.039*** (-5.039)		.033*** (-3.623)	-.373*** (-4.969)		-.421*** (-4.695)	.047 (4.119)		.042*** (.002)
L_BSIZE		.188*** (-3.453)	.077 (-1.172)		-1.285** (-2.247)	.642 (.983)		.199** (2.486)	.059 (.543)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R2	.136	.068	.138	.150	.064	.150	.078	.021	.074
F-statistic	4.856***	2.867**	4.43***	5.158***	2.697***	4.633***	3.067***	1.542	2.72***
Observations	181	181	181	181	181	181	181	181	181