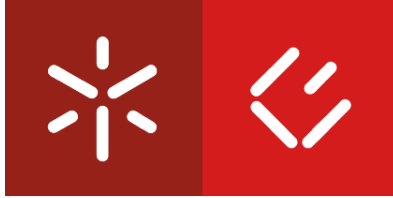


Universidade do Minho
Escola de Economia e Gestão

Cláudio Roberto Marinho Freitas

**Gender Diversity in the Board of Directors
and its Impact on Firm Value and
Corporate Governance:
European Evidence**



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Dissertação de Mestrado
Mestrado em Finanças

Trabalho efetuado sob a orientação do
Professor Doutor Gilberto Ramos Loureiro

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Cláudio Roberto Marinho Freitas

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Gender Diversity on the Board of Directors and its Impact on Firm Value: European Evidence

ABSTRACT

Throughout all Europe, numerous countries have been imposing mandatory quotas regarding the presence of women on the board of directors. This regulation seeks to increase board diversity with the argument that imposed female quotas may help enhance corporate governance and firms' financial performance. Using a sample of 1092 European firms, from 2005 to 2016, I examine the impact of board gender diversity on firm value and some aspects of corporate governance. In most parts of my dissertation, I follow the approach of Adams and Ferreira (2009). Their insight allowed to formulate 5 hypotheses based on the attendance of the directors, the linkage between directors' (and CEO's) compensation and firm's stock performance, the sensitivity of CEO turnover and, ultimately, the effect of gender diversity on firm value. The literature shows a variety of results regarding this "female effect" on corporate performance. In this study, the results support the hypothesis that women tend to improve the monitoring quality of the board in aspects related to compensation, attendance and CEO Turnover. Overall, the percentage of female in the board is negatively related with firm value. Nevertheless, when controlled for the level of corporate governance and fixed effects, this study demonstrates that women tend to impact positively the value of well-governed firms but end up harming poorly governed firms, maybe due to the constraints produced by entrenched directors. These outcomes support the argument that mandatory quotas serve primarily the purpose of increasing gender diversity and equality of opportunities. However, board female quotas also have some positive consequences for corporate governance and performance in firms with strong prior governance standards.

KEYWORDS: Board of Directors, Gender Diversity, Corporate Governance, Board Effectiveness, Firm Value

A Diversidade de Género no Conselho de Administração e o seu Impacto no Valor da Empresa: Evidência Europeia

RESUMO

Por toda a Europa, muitos países têm imposto quotas obrigatórias em relação à presença de mulheres nos conselhos de administração. Esta regulação procura aumentar a diversidade do conselho, argumentando que a imposição destas quotas pode ajudar a aumentar a governança corporativa e o desempenho financeiro da empresa. Utilizando uma amostra de 1092 empresas Europeias, de 2005 a 2016, procuro estudar o impacto da diversidade de género no valor da empresa e em alguns aspetos de governança corporativa. Em grande parte da minha dissertação, segui a abordagem de Adams e Ferreira (2009). A sua visão permitiu a formulação de 5 hipóteses baseadas na presença às reuniões por parte dos diretores, na ligação da compensação dos diretores (e do CEO) ao desempenho das ações, na sensibilidade da mudança de CEO e, por fim, no efeito da diversidade de género no valor da empresa. A literatura sugere resultados variados em relação a este “efeito mulher” no valor da empresa. Os resultados obtidos suportam a hipótese de que as mulheres tendem a desempenhar um papel mais rigoroso, afetando positivamente a eficácia do conselho em termos de remuneração, de presença nas reuniões e na mudança de CEO. Globalmente, a percentagem de mulheres influencia negativamente o valor da empresa. Não obstante, quando controlado para o nível de governança corporativa e para efeitos fixos, este estudo revela que as mulheres tendem a ter um impacto positivo no valor de empresas bem governadas mas que acabam por ter um impacto negativo em empresas mal governadas, talvez devido às restrições que sofrem por parte dos diretores entrincheirados. Estas conclusões suportam o argumento que as quotas obrigatórias servem primariamente o propósito de aumentar a diversidade de género e a igualdade de oportunidades. Mesmo assim, estas legislações têm algumas consequências positivas na governança corporativa e na performance das empresas que tenham, anteriormente, bons princípios de governança.

Palavras-Chave: Conselho de Administração, Diversidade de Género, Governança Corporativa, Eficácia do Conselho de Administração, Valor da Empresa

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“In today’s business environment, a modern organization can only be as successful as its leader’s ability to navigate near-constant change”

Rajeev Vasudeva, CEO of Egon Zehnder.

1. INTRODUCTION

According to the “2016 Global Board Diversity Analysis” of Egon Zehnder, a leader by himself can no longer be the synonym of “alone catalyst” of the firm’s success. It is now connected to the ability to expand its individual excellence in order to establish teams with high-performance cultures. This is a challenge due to the constant shifts business environment has been suffering and the imminent change of the *status quo*.

Hence, the true secret to achieving a higher financial success is highly correlated with the ability demonstrated by each company’s manager. Managers must master the art of collaboration, leading every individual to feel that they belong to the company and are making a real contribution to it. Moreover, understanding the new paradigms and being able to adapt to them, bringing more diversity into play, are key factors that, nowadays, contribute to the good reputation of managers.

In recent times, one of the main shifts in management paradigms has been the increasing importance attributed to diversity, either gender, ethnical or religious. Many have been the public movements, the projects and the political pressures to assure and enhance diversity at the top management levels and leadership of the companies¹. In Europe, the main driver for diversity has been the legislation that imposes a mandatory quota for the percentage of women in the board of directors². It creates a major challenge not only because firms will have to move out of their comfort zones and put more effort into finding new board members, but also because gender diversity may bring new perspectives and additional discussions about corporate activities, which may improve the monitoring quality of the board.

Accordingly, the purpose of this dissertation is to test empirically whether there is a positive relation between the presence of women in the board of directors and the minimization of the agency costs³, in the European markets. In other words, if increasing gender diversity in the board has a significant positive

¹ The American Sarbanes-Oxley Act (2002), the proposals from the IRRC (Interfaith Center on Corporate Responsibility), the British Higgs Report (2003) and the Australian Human Rights Commission, are perfect examples of that.

² Set of individuals elected as representatives of the shareholders to oversee the activities of the company, defending shareholders’ interests

³ Costs that arise due to the necessity of monitoring and control the CEO’s actions (Jensen & Meckling, 1976).

impact on firm value. This being true, it may result from an improvement in the quality of the firms' corporate governance. To better identify the possible mechanisms linking board diversity and firm value, I will also examine how gender diversity impacts the overall effectiveness of the board in monitoring managerial activities and defining incentive-aligned compensation schemes.

Across the globe, in the past decades, many changes have occurred regarding feminism and cultural diversity. It has become one of the most important discussions in the social and business environments of society. Corporate entities, employers and managers have become more and more diverse. Thus, gender diversity has followed an ascendant tendency throughout the last few years.

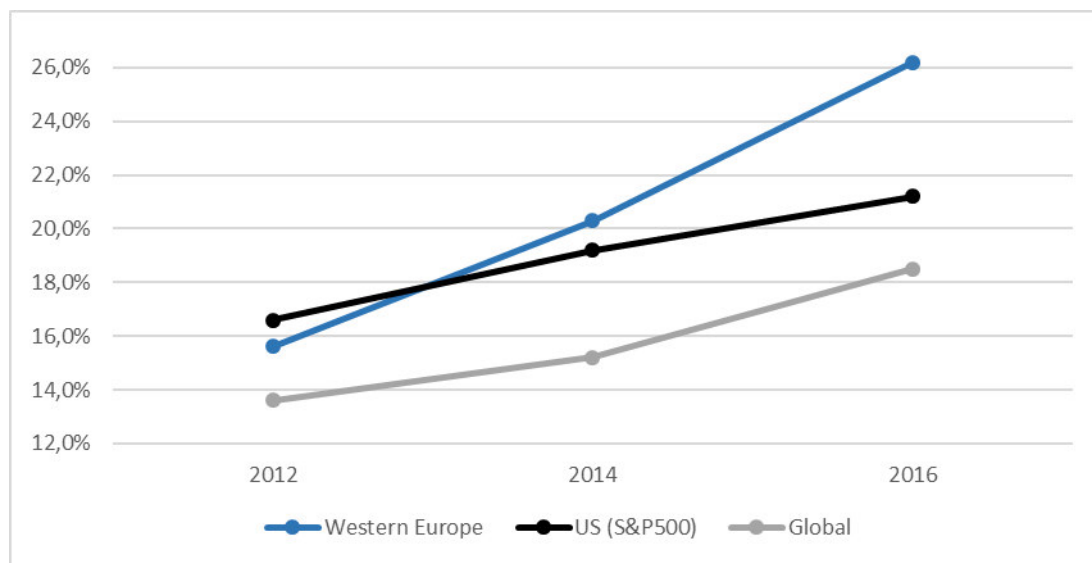


Figure 1 – Data for Percentage of Board Seats Occupied by Women (2012-2016) for a perception of the Evolution of gender diversity. *Adapted from Egon Zehnder (2016), aggregating data from www.catalyst.org/knowledge. Last accessed 03rd February 2018*

Therefore, there is no surprise that in 2016 the percentage of board seats occupied by women worldwide increased to a level of 18.5%. From a deeper analysis of Figure 1, we can understand that some major players have sustained this global growth. Both Western Europe and the U.S. have been experiencing the effects of the abovementioned movements and political legislation. Even though in the U.S. the phenomenon seems to be losing some steam, in Europe it continues to grow at an impressive pace, achieving a percentage of 26.2% (more 7.7 percentage points than the U.S.), in 2016.

The spotlight has been turned to the female section of the population, which represents, roughly, 50% of the global population⁴. In March 2017, Iceland has become the first country to introduce legislation

⁴ According to the Female Quotient (2018), this percentage is around 49.7%.

requiring employers to prove that both female and male workers receive the same wage (The Female Quotient, 2017). Starting in 2018, Norway's male football team agreed to a salary cut, so that the female side could receive the same amount of money as they did to represent their country (The Female Quotient, 2018). The Canadian Senate has even passed, this year, a bill that intends to change their national anthem into a gender-neutral form ("Canada votes for gender-neutral anthem", 2018).

As easily predicted, the pro-female movements arrived at the doorstep of the business world. A research performed by McKinsey Global Institute, in 2016, argued that if women participated equally to men, they could add as much as 28 trillion dollars to the worldwide economy by 2025 (Madgavkar, Elingrud & Krishnan, 2018). Regarding, efforts to achieve this equality have already started to appear in legislation regarding the quota of women.

Norway, in 2003, became the first country to impose a mandatory quota of 40% of women in each board of directors⁵. Finland and Spain joined the movement by setting quotas of 30% and 40%. Later, in 2011, both Belgium and Italy legislated their quotas for 33%. More importantly, two countries with massive political influence, France and Germany, also followed the trend and passed a new quota of 40% and 30%, respectively ("Legislative Board Diversity", 2018). Even though in the United Kingdom bills like this have found themselves to be difficult to approve, after being rejected in 2015 and 2017, the Higgs Report⁶ argues and supports the enhancement of gender diversity to improve board effectiveness.

Theoretically, there are arguments supporting that the more diverse the board is, the higher is the firm's financial health. Robinson and Dechant (1997) argue that superior corporate diversity is able to promote a higher understanding of the marketplace, which is also highly diversified. Firms will, therefore, be more capable to penetrate other markets, leading to expansion. Moreover, women can bring a distinct set of cognitive understanding, which is not uniformly distributed through the population and tend to vary with gender and other characteristics, enhancing creativity and innovation that can be used either for problem-solving or to develop the business. Finally, the adaptation performed to successfully integrate diversity on the board reveals a more effective leadership with a broader mind and superior relations and decisions. This way, firms avoid substantial costs that arise from the poor turnover and absenteeism due to dissatisfaction in the carers and in the prospects of its evolution (Cox & Blake, 1991). The imposition of quotas and the consequent search for women can induce further effects on the company. Ferreira,

⁵ Quota which was complied by April 2008, for all public listed companies, keeping the percentage of women constant around 40% thereafter.

⁶ Elaborated by the British Department of Trade and Industry, in order to understand how the British companies were dealing with gender diversity.

Ginglinger, Laguna and Skali (2017) demonstrated that the legislation obliges companies to make a higher effort to find suitable female board members that further leads them into finding stronger male candidates by browsing in less used talent pools. Also, Adams and Ferreira (2009) studied and demonstrated that women bring into the board more effective corporate governance methods and mechanisms, better monitoring of the CEOs' activities, and better protection of shareholders' rights.

Overall, the literature seems to suggest that imposing female quotas helps to improve the quality of the board. This places gender diversity in the heart of the agency theory, which studies the relations established between agents (CEOs) and principals (shareholders). The separation between ownership and control - referred in the seminal works of Berle & Means (1932) and Jensen & Meckling (1976) – gives latitude for managers to pursue personal goals that deviate from shareholders' interests. Companies try their best to prevent this kind of behaviour, by spending resources (agency costs) in implementing a variety of corporate governance mechanisms⁷.

The board of directors is one these mechanisms and, according to Fama and Jensen (1983), is an effective one since it effectively monitors the CEO's actions, and it also sets compensation plans and dismisses the CEO when appropriate. One interesting feature is that the more independent the board is the greater its effectiveness (Hermalin & Weisbach, 1988). By not belonging to the "old boys club", female directors could be closer to the theoretical concept of independence (Adams & Ferreira, 2009).

In this dissertation, I will focus on the impact that gender diversity causes on the quality of the board of directors as a corporate governance mechanism and on the overall firm value. To the best of my knowledge, my research brings a new view to the previous literature, by performing a European analysis, encompassing several countries that have imposed quotas and many others which have not. This dissertation employs a sample from 2005 to 2016 of firms from 19 different European countries. Thus, the main advantage is to study the impact of women in business, in countries that are open to diversity and in others that are still struggling to embrace it in their societies.

Generally, I found that women enhance the quality of the mechanisms of corporate governance. They improve the Attendance to the meetings, the incorporation of long-term objectives in the directors' compensation and the likelihood of CEO Turnover after poor performance, which is consistent with the study of Adams and Ferreira (2009). Moreover, there is some evidence that suggest that, for a level above

⁷ See Becht, Bolton and Röell (2005) for a review and research of the main mechanism of corporate governance.

30% of gender diversity, women increase the likelihood to link the CEO's compensation to the shareholders' return. Finally, I conclude that this overall increase in governance has different results for companies that are well governed or not, elevating (due to a more open and hearing board) or diminishing their value (due to constraints performed by entrenched directors), respectively.

The remainder of this dissertation is divided as follow. In section 2, *Literature Review*, I am going to perform a gathering of the related literature, discussing it. Section 3, *Hypotheses and Methodology*, shows the hypotheses developed and the models and methods used to conduct this empirical research. Section 4, *Data Description*, is used to understand how the data was collected and its range. Section 5, *Empirical Results and Discussion*, reveals the results obtained, discussing and explaining how they affect the effectiveness of the board and, ultimately, the impact on firm value. Section 6, *Conclusion*, comprehends all the most important outcomes and the limitations of the research. Section 7, *References*, gather all the references used and, lastly, in Section 8, *Appendix*, some Tables with the variables specification, information and additional tests are demonstrated.

2. LITERATURE REVIEW

The relations established in the business environment are one of the main and most complex ways of social interaction. It is created whenever two parties enter into a contractual arrangement. In a corporate environment, the most typical type of contract is established between two parties, the agent and the principal, where the first (typically the manager) has the power to make decisions but should act on behalf of the second (typically the shareholders). However, each side tries to maximize its own utility (Ross, 1973), which may lead managers to pursue personal interests and deviate from their moral duty to make their best effort with the sole purpose of maximizing shareholder wealth. Adam Smith, in 1776, already argued this issue. He stood from the perspective that a director managing someone else's money, will not do it with the same vigilance that he would if the money was his own. Indeed, the separation that occurs between the managers and the shareholders of the company is, commonly, accepted as the heart of the agency problem⁸ (Berle & Means, 1932). The deviating behaviour of a CEO who acts in his own best interest, yields costs to the company (Shleifer & Vishny, 1986). Those costs are the expenses spent on implementing incentive-alignment and monitoring mechanisms as an attempt to improve the quality of managerial activities in accordance with the shareholders' interests (Jensen & Meckling, 1976). Then a question surfaces: which mechanism, incentive or action can be used to fulfil this purpose? Actually, in a company, many mechanisms are put into action, linking each one's capability to increase the overall corporate governance. There is extensive literature covering the question above. In this section, I review the literature on three main mechanisms of corporate governance: executive compensation, CEO turnover, and the board of directors. The latter cannot be separated from the previous two, as strong boards make important decisions about CEO compensation and turnover. Given the objectives of this study, I will then focus on studies that analyse the impact of including more women in the board of directors on the quality of firms' corporate governance and the market value of their equity.

2.1 Mechanisms of Corporate Governance

According to Becht, Bolton, and Röell (2005), a corporate governance problem happens every time a principal (shareholders, creditors, suppliers, etc.) disagrees with the course set by the manager and wants to exercise control. The conflicts of interest between principals and agents are aggravated when the

⁸ Problems that arise due to conflicts of interest between the CEO and shareholders, see Fama (1980).

ownership of the firm's equity is more dispersed⁹. Thus, some mandatory governance rules¹⁰ had to be formulated to overcome the collective shareholders' problems and to ensure that all others stakeholders' interests are represented and protected. These rules were implemented and adapted in order to create the current mechanisms of corporate governance, both external and internal to the company. One might think that, since they all serve the same purpose, the use of multiple mechanisms could somehow disturb their individual effectiveness. However, there is evidence of some interdependence between the mechanisms, and that the joint performance of them leads to a better monitoring of the managers (Agrawal & Knoeber, 1996).

Since the purpose of this dissertation is to study the impact of women, I will not approach any of the external mechanisms¹¹. I will address instead the internal ones because the quota's legislation allows women to enter an internal mechanism of corporate governance: the board of directors. From here, they can, therefore, affect and enhance the effectiveness of the other governance mechanisms (Adams & Ferreira, 2009): CEO turnover and Executive Compensation.

Before reviewing the possible impact of women in corporate governance it is important to understand how every mechanism monitors CEO's behaviour.

2.1.1 Executive Compensation

The compensation provided to the CEO in their executive contracts is designed to align the interests and objectives of both the manager and the shareholders (Becht et al., 2005). These incentives can come in the form of performance-based bonuses, salary revisions, stock options and performance-based dismissal (Jensen & Murphy, 1990). This way managers are rewarded if they focus on firm value, instead of their own interests and benefits.

The perspective that this kind of incentives influenced positively the CEO's behaviour was largely accepted, even in the 90's (Becht et al., 2005). Still, Baker, Jensen and Murphy (1988) argue that the incentives provided in the compensation contract must be carefully set, knowing that inappropriate compensation may not produce any significant incentives for better governance.

⁹ For a similar explanation, see Zingales (1998).

¹⁰ Another definition for mechanisms of corporate governance.

¹¹ For the review of these mechanisms see: Cannella, Fraser, and Lee, (1995) for Managerial Labour Market, Becht et al. (2005) and Kini, Kracaw, and Mian (2004) for Market for Corporate Control, Becht et al. (2005) for Shareholder Activism and Shleifer and Vishny (1997) for Monitoring by Large Investors.

Later, Mehran (1995) studied the impact of the percentage of equity-based of CEO's total compensation. Here, he found that firms with higher equity-based payment performed better than the others, demonstrating that specific types of compensation give the proper incentives and impact corporate efficiency.

More importantly, the level of independence of the board of directors tends to increase the use of this equity-based compensation (Mehran, 1995) and to diminish the total compensation received by the managers, leading to less occurrence of excessive pay (Core, Holthausen, and Larcker, 1999).

2.1.2 CEO Turnover

CEO turnover is an important feature of the company to enhance corporate governance (Brunello, Graziano, and Parigi, 2003). The firm will be better governed when its mechanism to replace bad CEOs are more effective (Becht et al., 2005). Accordingly, the board of directors uses the CEO turnover to punish managers if poor financial performance has occurred (Farrell & Whidbee, 2003).

Many studies have already analysed this connection between stock performance and CEO replacement. Warner, Watts, and Wruck (1988) argue that firms that deal with inferior stock returns have a higher probability to change their CEO than other firms¹². However, this poor stock performance per se may not be the decisive factor to lead to managerial change. Farrel and Whidbee (2003) demonstrate that the board can, actually, focus more on deviations from expected performance, the consensus from analysts, than from mere firm's real stock return.

This evidence supports the hypothesis that the board performs a monitoring role and acts when the firm is being run poorly. Brunello et al. (2003) argues, in their Italian research, that, even in boards and companies with an elevated level of insiders¹³, there is a significant negative relation between the dismissal of a CEO and the stock returns¹⁴. However, Weisbach (1988) documents that firms with higher independence level in their board of directors have a higher probability to replace their managers prior to poor stock performance. His study was later supported by Borokhovich, Parrino, and Trapani (1996),

¹² Also, Coughlan and Schmidt (1985) report equivalent results for this link.

¹³ Their study was conducted in Italy, since Italian companies tended to be significantly run by families, or family-relatives, concentrating both management and monitor seats in the hands of insiders.

¹⁴ Considering that the CEO is not the owner or family relative, situation in which there is almost no possibility of CEO Turnover.

who also report that the existence of outside directors increases the chance to fire a CEO that is not producing positive results.

Besides enhancing corporate governance, this turnover also leads to a better stock performance. Huson, Parrino, and Starks (2001) studied the existence of statistical abnormal returns after the announcement of a managers' dismissal. He found that investors see this succession as a positive enhancement of corporate performance, leading to positively abnormal returns¹⁵.

Accordingly, this mechanism provides not only a better monitoring of the management but also transmits it to the investors, that correspond by providing a superior stock performance.

2.1.3 Board of Directors

This section examines one of the most effective mechanisms of corporate governance. The board of directors and some external auditors act as representatives of the various shareholders that have a relatively large ownership stakes, and, because of that, want to protect their interests against the management's deviations (Becht et al., 2005). These board members have not only the responsibility of selecting a CEO, but also the obligation to monitor him and the firms' financial performance and to intervene in some important decisions (Brealey, Myers, Allen, and Mohanty, 2012). The Business Roundtable takes it even further and distinguishes five prime functions for the board of directors: select, evaluate and set the CEO's compensation, but also, if necessary, replace the CEO and manage his succession plan; evaluate and support the firm's objectives and strategies in both financial and management plans; promote guidance and supervision to the CEO; gather and recommend a set of candidates for election to the board, for the shareholder's evaluation and assessment of board performance; and provide adequacy of systems in order to fulfil the current standards and regulation (The Business Roundtable, 1990). For Fama and Jensen (1983), this mechanism is extremely important because it assures the quality of the value-creating decisions taken by the CEO, when it exist a separation between management and ownership of the company.

¹⁵ Comparable results were found by Weisbach (1988), consistent with the hypothesis that board creates value to the firm by removing bad CEOs.

2.2 Composition of the Board of Directors

One interesting feature of the board of directors is that much of their work goes unnoticed. Curiously, people frequently question the work developed by the board and if it really matters. However, as we know, every time something goes wrong the spotlight rapidly turns to these monitoring agents and the reason they exist once again stays crystal-clear. Their main job is to avoid the occurrence of frauds like Enron or WorldCom (Adams, Hermalin, and Weisbach, 2010). Due to this significant importance, and because much of the work (if everything is going smoothly and positively, with no attempts of fraud) is unseen, it is interesting to understand how the board and its members' characteristics can affect its effectiveness.

2.2.1 Size

It is one of the many characteristics of the board that is considered to have a significant impact regarding its performance. Some reforms have been performed calling for a decrease in the number of board members, since it is believed that larger boards are associated with lower firm value (Boone, Field, Karpoff, and Raheja, 2007)¹⁶.

Lipton and Lorsch (1992) argued that the majority of the boards are dysfunctional since directors tend to not criticize the CEO's policies nor to frankly discuss the corporate performance. They also argued that these problems are aggravated as the number of directors increases. Even though the monitoring capacity of the board increases, the benefits are outweighed by the costs of slower decision making and less candid discussions about the firm's strategy. Jensen (1993) reinforces Lipton's conclusions by explaining that a larger board tends to focus more on politeness and courtesy that supplants the truth and honesty in the discussions¹⁷. The costs of communication and coordination are much higher leading to less effectiveness of the monitoring job, which makes it easier for the CEO to control the board.

Both Yermack (1996) and Cheng (2008) demonstrate the negative relation between board size and firm value¹⁸. Yermack was able to reject the hypothesis that poor performing companies had a larger board since they were appointing more independent directors to increase governance and, thus, the board size would increase. He found that when firms are performing worse the directors' turnover rate increase (due

¹⁶ Examples of these efforts and "reforms calls" include Institutional Shareholders Services, Council of Institutional Investors, the National Association of Corporate Directors, The Business Roundtable and the TIAA-CREF (Boone et al., 2007).

¹⁷ Both authors agree that the preferred board size ranges from seven to nine directors.

¹⁸ Eisenberg, Sundgren, and Wells (1998) also conclude this same negative relation between firm performance and board size.

to the replacement for better and independent ones) but the board size remains the same throughout the process. Cheng revealed that a larger board also impacts the corporate performance, leading to lower ROA, R&D and M&A decisions. Due to the need of more communications and compromises to achieve a consensus, fewer decisions that can be viewed as extreme are taken.

Boone et al. (2007) explain that board size tends to increase as firm grow and diversity over time and that they are constituted and tailored to suit the firm's unique characteristics and environment. Linck, Netter, and Yang (2008) takes it beyond and argues that smaller boards are not necessarily better than large boards, it depends more on the level of independence. Some firms experience a smaller and less independent board and others have a larger board but with more outsiders. Thus, the impact on this area is still unknown and unpredictable.

2.2.2 Independence

Another key feature regarding the board of directors is the independence of their members. Outside directors, since they are independent from the management, are thought to be keener to question the managers, in order to protect the shareholders' interests. In the early years of the new millennium, this conventional wisdom was widespread leading to specific legislation to enlarge independents' presence in the board and key committees¹⁹ (Duchin, Matsusaka, and Ozbas, 2010). These laws are seen with some scepticism since, in theory, some information asymmetry can occur. The CEO determines what is the agenda and the data provided to the board, which can diminish the effectiveness even of the most talented members of the board (Jensen, 1993).

Thus, it is not surprising the existence of some contradictory evidence. Bhagat and Black (2001) studied this relation and found that normally poor performing firms try to solve their issues by appointing independent directors to the board. However, they do not discover any evidence that this type of behaviour really enhances firm's value and profitability²⁰. On the other hand, Agrawal and Knoeber (1996) demonstrate that the inclusion of more independent directors can lead to a negative impact on Tobin's Q.

¹⁹ In these regulations, we can include the Sarbanes-Oxley Act (2002) and some rules disseminated by the SEC, NYSE and NASD (National Association of Securities Dealers).

²⁰ Hermalin and Weisbach (1991) and Fields and Keys (2003) are also unable to find a statistical significant relation between these two realities.

As an advocate of the positive relation, Weisbach (1988) argues that a more independent board is more likely to fire a bad performing CEO. Even more, when hiring a CEO, a more independent board is also more likely to appoint a manager that is independent from the company, bringing someone that is not related with the business so far (Borokhovich et al., 1996). These seem to be characteristics that give good indicators to the markets about the work of independent directors, therefore evidencing a positive stock price reaction whenever an independent director is appointed to the board (Rosenstein & Wyatt, 1990). Finally, Independent directors seem to deal better with the conflict of interests that happen, yielding positive impact to owners of the company (Cotter, Shivdasani, and Zenner, 1997).

As more studies were performed, more complexity was added to the discussion. Duchin et al. (2010) argued that the impact of the outside directors depends on the cost of acquiring information. Since they are outsiders, they rely on their persuasive power to extract information from the managers or insiders. If this costs too much then the effectiveness of this type of directors decreases, leading to an insignificant impact. However, if the costs are low, a statistically significant positive impact is attributed to their presence in the board. Also, in this area, Harris and Raviv (2006) showed that, since insiders have valuable information that may not be available to outsider directors, the loss of data can be costlier than the agency costs associated with a large insider board. This effect only tends to disappear when agency costs are large enough to offset the costs of information asymmetry.

At last, and regarding the specificity of the directors, Kumar and Sivaramakrishnan (2008) analysed the board members' effort and dependence on the manager. They related that directors also have an effort aversion that, combined with the dependence on the CEO, can lead them to underperform, even if they are independent.

2.2.3 Other Factors – Board Diversity

Besides the previous and older concerns about board composition, some new factors have been receiving more attention. The main governance aspect that is, nowadays, challenging managers, shareholders and directors of a corporation is the race, gender and culture of each member of the board (Carter, Simkins, and Simpson, 2003). Therefore, many press reports, company's proposals and policy statements²¹ have increased the awareness of this matter.

²¹ In this paradigm, we can include the Interfaith Center on Corporate Responsibility (ICCR), that has sponsored many proposals to increase board diversity in the larger firms encompassing Texaco, First Data, Unocal, Circuit City Stores, Sprint and York International. Also, TIAA-CREF defends a policy statement

Carter et al. (2003) studied board diversity and define diversity as the percentage of women or race minorities (Hispanic, Asians and African Americans) on the board. They found that there was a positive and statistically significant relation between women and minorities and firm value (Tobin's Q). Moreover, there is evidence of synergies between the groups in analysis, since higher proportions of women stimulate the company to have a higher proportion of minorities and vice versa. Later, Carter, D'Souza, Simkins, and Simpson (2010) approached again this paradigm to argue that, after an estimation by fixed effects and 3LS, no significant relation was found relating board diversity and firm value. They, however, defend that the lack of relation between firm value and diversity should not discourage adding diversity to the board. This may be due to the capacity of increasing group decision-making, changing group dynamics, that can yield a higher firm financial performance (Erhardt, Werbel, and Shrader, 2003). This thematic will be further detailed and on this subsection will be given focus to every other type of board diversity that have been studied.

It is also believed that an optimal board should encompass moderate diversity in some key dimensions, that could also help to enhance board diversity, for instance, age and tenure. The introduction of younger directors is suggested as a way to improve organizational performance (Bere, 1991). Regarding, it appears this diversity does not tend to empower the company at any level, yielding solely higher levels of donation, if it has too many age groupings (Siciliano, 1996). However, if only certain amounts of different ages and tenures are applied to the board some benefits appear. Only if this variety is too excessive the firm's financial performance will suffer negatively (McIntery, Murphy, and Mitchell, 2007)

Furthermore, globalisation has been playing a very important role in changing corporate dynamics. It has been important by breaking the information barriers across the world, which has even been providing the opportunity to incorporate different corporate governance's systems. This will allow companies to achieve higher financial flexibility, leading to a cut in their cost of capital (Randoy, Oxelheim, and Stonehill, 2001). Thus, Oxelheim and Randoy (2003) studied the effect of foreign board members on firm financial value, in Swedish and Norwegian firms. The companies that evidenced to have foreign directors displayed significantly higher values than the ones that have not. It supports the hypothesis that firms that successfully break down the domestic capital market and improve themselves with an Anglo-American system, add value to themselves. The advantages for the company also encompass the capability to enhance their reputation in the financial markets by guiding the focus of the company to the international

referring that any board must be structured in order to incorporate qualified individuals, that can bring their own diversity in terms of race, age, gender and experience (TIAA-CREF, 1997).

view and demonstrating openness to international investors, which creates an opportunity by setting down the cost of capital (as an alternative for foreign listing).

One last area of diversity that is analysed is the background diversity. Each member of the board brings with them their individual interests, commitments and knowledge (Baysinger & Butler, 1985). Kosnik (1990) argues that the outsider director's occupation may show itself as a crucial factor to form a well-balanced and active group of directors. Accordingly, Hackman and Morris (1975) suggest that the decision-making process' outcomes will experience higher quality due to the wider diversification in the perspectives and experiences that different careers bring to the table. However, Kosnik (1990) found that this heterogeneity in interests and occupations might diminish the capabilities to relate to each other, by reducing, for example, the resistance to greenmail²². Still, Goodstein, Gautam, and Boeker (1994) advocate the importance of successfully integrate these different occupations and to measure it in board structure for better performance.

2.3 Theories of the Board of Directors

After reviewing the literature in the previous sections, one cannot state for sure that there is one feature of the board of directors or even the board of directors itself, that is widely accepted as being positively or negatively correlated with an increase in a company's corporate governance. It is unlikely that one characteristic that can impact the board of directors' dynamics would affect every company the same way. This is related to the way each board is constituted, in other words, the view that the company had about the board's functions when it was created. By reviewing the literature, I was able to identify three different views about the board of directors: Value Maximizing Boards, Captured Board Hypothesis and Boards as Window-Dressing (Ahern & Dittmar, 2012). Each theory will be detailed below, but it is important to notice that the impact of legislation that forces the board to change its composition will, therefore, be different according to each theory: it can create or destroy value or do not provide a significant impact at all.

²² Supporting this view, we also have Clegg (1990) and Powell (1991) arguing that the higher the diversification in terms of interests the greater the probability for conflict and formation of factions.

2.3.1 Value Maximizing Boards

Large publicly traded companies have an ownership structure more dispersed that separates ownership from the management's decisions, creating the necessity to oversee the quality of such decisions. Demsetz and Lehn (1985) theorize that there is a possible gain that derives from effective monitoring and control of the manager's actions. They also state that if the external mechanisms of corporate governance²³ operate perfectly there would be no need to control internally the management. However, since these mechanisms tend to operate with some costs, company's owners must exercise their power to control the CEO. Here, the firm's environment plays a key role in influencing the type of control exercised internally over the manager. If the company is a regulated utility or a financial institution, if the environment is more or less predictable (mass media, sports industries...), the size of the company and the instability of the profits margin make the cost to control higher or lower and, therefore, impact the way the control (board) is exercised. The noisiness of the company's surrounding environment makes monitoring tighter or looser. Thus, Demsetz and Lehn (1985) argue that the level of monitoring is adapted with the view of maximizing firm value.

2.3.2 Captured Board Hypothesis

Bebchuk and Fried (2005) studied how the managerial power impacts and influences the board of directors when compensation contracts are being set. Commonly, the process of payment-set of the CEO has been accepted as produced by *arms-length contracting*²⁴, which served as a basis for many laws to corporate governance. Bebchuk and Fried, however, argued differently. Their analysis indicates that management uses their power over the board, shaping the compensation more at their convenience. Therefore, many distortions of these contracts occurred leading to a type of compensation that provides fewer incentives for the managers to provide an excellent job, which lowers the long-term firm value. The management is able to influence the insufficiently motivated board members to poorly defend a compensation that meets the shareholders' interests, exploring the possible incentives and tendencies that can lead the directors to deviate from the arm's length contracting and over-pay the executives²⁵.

²³ They specify these external mechanisms as being the market for corporate control and the managerial labour market (Demsetz & Lehn, 1985).

²⁴ Contracting policy where there is an attempt by the executives to reach the best deal for themselves while the board members perform their best to protect the shareholder interests (Bebchuk & Fried, 2005).

²⁵ The weaknesses that are often explored include the small costs of favouring executives, solidarity (since some directors are or were top managers of other companies), friendship or loyalty (many directors had prior connection and relation with the CEO), the executive power to benefit directors (through higher compensation and rewards) and interest by the directors to be re-elected by the management. For more detailed description see Bebchuk and Fried (2005),

Accordingly, they defend the view that some boards are captured by the CEO, who is able to exercise control over them, obtaining “rents”²⁶. With this view, the board reforms that have been imposed will elevate the firm value, since it will diminish the power that the manager can pour over the board, leading to a more effective corporate governance system.

2.3.3 Boards as Window-Dressing

Helland and Sykuta (2004) studied the various roles that political directors may perform on the board of directors, by examining the composition of the board on specific times and its change when the external environment has some kind of shock, namely regulation changes. If, theoretically, their value derives from the knowledge and connections to regulatory processes, it is expected that their specific characteristics enhance firm value in periods of comprehensive regulation. Still, Helland and Sykuta hypothesize that the presence of these directors can follow other reasons: they provide an advisory role (due to their expertise or political access), they are consistently as good as other directors in monitoring the CEO or they just act as window-dressing not adding anything to the board quality. Their results suggest that firms who are surrounded by a more regulated environment tend to protect themselves by adding more political directors to their board. However, there is no evidence that such directors add any improvements in the functions of the board. Therefore, the board is seen as a window-dressing because, even though they have lower quality directors, regulated firms are not significantly poorly governed compared to their non-regulated peers. Also, Romano (2005) argues that the ineffectiveness of the Sarbanes-Oxley Act in improving corporate governance of a company. This hypothesis states that, at least to some extent, boards tend to act as window-dressing, and not performing a better or worst function only by changing their constitution. Thus, the changes performed by the laws passed in countries about the composition of the board, will not enhance nor diminish the value of a firm.

2.4 Impact of Gender Diversity on the Board of Directors

Nowadays, with the growing visibility of women in business and the political issues of gender equality, studying the impact of appointing women to corporate boards (either on board functions or firm value) has become a major topic of interest. Even though the relation between gender diversity and financial performance (detailed in next chapter) has been increasingly studied, few studies approach their impact

²⁶ The benefits earned by the CEO that is above to those that would be given if an effective arm's-length contracting conducted the process.

on board effectiveness and decision-making (Nielsen & Huse, 2010). Still, diversity among the constituents of the board has been advocated as a possible trigger for enhanced organizational performance by giving new insights and perspectives to the board (Siciliano, 1996). Additionally, the differences evidenced between men and women in terms of behaviour and skills in specific situations (Yukl, 2002) and in the leadership styles (Nielsen & Huse, 2010), are claimed to have important implications in terms of the board dynamics and processes.

Nielsen and Huse (2010) researched this subject in Norwegian firms. They found that women enhance board effectiveness by reducing the level of conflict, improving the quality of the board development activities and increasing the board strategic control. This is consistent with the view that women are valuable due to their ability to input a more strategic view and to develop a more productive discourse (Bilimoria, 2000).

The presence of women in the committees that are associated with the board also evidences a positive impact. More specifically, the presence in the audit committee enhances its effectiveness by disclosing better reporting discipline with higher earnings quality (Srinidhi, Gul, and Tsui, 2011). This improvement is important to the board since it represents good governance prospects to investors. Fernandez-Feijoo, Romero, and Ruiz (2012) further demonstrated that this increase in the quality of the reports is higher when the critical mass²⁷ of women directors is achieved. Regarding this concept, Torchia, Calabrò, and Huse (2011) defend that, by attaining the critical mass, firm's innovation level will increase. According to them, this happens because females are less constraint and feel more comfortable, being able to influence male's communication and behaviour, turning the focus of the board to more difficult and complex issues (Kramer, Konrad, Erkut, and Hooper, 2006).

A board with a stronger sense of gender diversity provides the company with a more effective monitoring, leading to more stringent enforcement of the ethical conduct, with positive consequences for shareholders' returns (Galbreath, 2011). This can be an effect of the different reasoning linked to each gender type. Women tend to have superior performance in terms of complex moral reasoning²⁸ than their

²⁷ This critical mass is achieved when three or more women are present on the board. It is believed that with this level of gender representation, women stop being seen as a tokenism and start to actively participate in the discussions and being heard. Therefore, they can apply more effectively their differences to men's thoughts and practices being able to enhance the board dynamics (Egon Zehnder, 2016).

²⁸ This complex moral reasoning encompasses the ability to acknowledge and consider the rights of each party involved, in order to pursue fairness decisions, through a mechanism of social cooperation and consensus building (Bart & McQueen, 2013).

male counterparts, leading to fairest decisions by the board, which are important when facing social concerns in these more complex times (Bart & McQueen, 2013).

Many more studies convincingly sustain the view that women must be added to the boards. For instance, Singh, Terjesen, and Vinnicombe (2008) claim that women normally bring to the board a more international diversity, more experience as directors of smaller firms²⁹ and a higher education level (more likelihood of holding an MBA Degree). Moreover, they can bring more knowledge about the female market segment, which can be very valuable for specific firms (Daily, Certo, and Dalton, 1999). When women are elected, the board starts to show signs of its development by adopting new practices (training, evaluations and successions plans) (Singh & Vinnicombe, 2004), shaping into a more civilised and sensitive form to incorporate other perspectives (Fondas & Sassalos, 2000), diminishing the “game playing” strategies (Singh et al., 2008) and more intensively questioning the practices (Konrad, Kramer, and Erkut, 2008). The search for women can also bring benefits to the company because they make a better use of the talent pool where they can “fish” in, shifting the company at the looks of the new generations (Terjesen, Sealy, and Singh, 2009).

Concluding, the existing empirical evidence seems to suggest that women are tougher monitors, assuming positions on committees from where they can influence male’s attendance to board and the likelihood of CEO turnover after mediocre performance (Adams & Ferreira, 2009). The authors defend that since women come, normally, from outside this business world, they tend to be more approximate to the theoretical sense of independence (Adams & Ferreira, 2009). Adams et al. (2010) argue that by displaying more independent thoughts they improve the monitoring actions, facilitating better earnings quality. Still, the best way for women to accomplish their purposes on board is to distance themselves from trying to model male’s behaviour and excelling by their authenticity (Bart & McQueen, 2013).

2.5 Impact of Gender Diversity on Firm Value

According to Farrel and Hersch (2005), firms are responding to both internal and external calls for diversity. This is the main reason for the increase in the presence of women in the board of directors. In the previous topic, I approached the impact of this diversity in some grounds that affect board effectiveness but not necessarily firm value (since these modifications and improvements in dynamics

²⁹ However, they tend to demonstrate fewer experience as CEO or COO, capacity still valued when choosing a director (Singh et al., 2008).

can lead to residual changes in firm's performance). However, it is believed that a strong board can directly affect the financial performance of the company (Kim, Burns, and Prescott, 2009)³⁰.

Thus, some empirical studies tried to understand if a more gender diverse board has real benefits for shareholders. Campbell and Minguez-Vera (2008) performed a study in Spain, right after the imposition of a quota³¹. They found that in a country known for its low level of female directors, the increase of this feature on boards has a positive impact on firm value, and the investors do not respond negatively to the appointment of women. This type of view gives some space for the gender diversity to improve the competitive advantage of the firm, positively affecting the behaviour of the customers, leading to a higher firm performance (Smith, Smith, and Verner, 2006).

More focused on the American markets, who have no quotas of this type, Shrader, Blackburn and Iles (1997) studied the connection between the percentage of female and the ROA and ROE. At that time, they found a negative relation between the presence of women in the board and firm operating performance. Contradicting Shrader, Carter et al. (2003) researched the gender and ethnic effect on firm value. They found a positive relation between the percentage of women and ethnic minorities in the board and the firm value, supporting the argument that diversity enhances the ability to create value for the shareholders. The argument of Carter et al. (2003) that women enhance firm value, impacting the organizational performance, was also sustained by Erhardt et al. (2003). Their results suggest that ROA and investment have a positive relation with the diversity on the board. Additionally, Adams and Ferreira (2004) addressed the impact of women on the managerial incentives. They found that firms with lower gender diversity tend to experience a more volatile stock price.

In Scandinavian countries, we can find more studies on this topic. Randoy, Thomsen, and Oxelheim (2006) found no evidence of any relation between company performance (stock market and profitability) and board diversity. Rose (2007) obtained equivalent results using a sample of Danish firms. The authors acknowledge that the imposition of quota did not produce value for the firm, but also did not harm the

³⁰ This view is supported by Zahra and Pearce (1989), that state that this link exists but the question still remains if the improvement on the board can results in solid changes in firm value.

³¹ This quota was imposed in 2007 affecting all publicly traded companies with more than 250 employees. The level was of 40%, but the quota was not mandatory. The no compliance will not lead to penalties just harms the company when public subsidies or state contracts are auctioned ("Legislative Board Diversity", 2018)

financial performance. Thus, it should be used as an opportunity equaliser, unless it leads to an increase in board size, detrimental to firm value (Randoy et al., 2006)³².

More recently, Ahern and Dittmar (2012) carefully studied the impact of the Norwegian mandatory quota. The announcement of the law led to negative abnormal returns that affected more companies that had zero female directors. This impact led to some evidence of a negative relation with Tobin's Q. In order to escape this compliance, some companies became private or opted to be listed in a foreign country, reducing by 70% the number of listed firms from 2001 to 2009. Studying the impact of the French quota, Ferreira et al. (2017) found that the quota leads the "elitist" firms to look beyond their regular pool of talents³³, forming more stable boards with a higher level of match between firm and directors. Adams and Ferreira (2009) even give evidence that women tend to have a negative impact on firm value, after controlling for endogeneity, due to their over-monitoring capacity. However, they defend that on poorly governed firms, the addition of women will raise the firm value, adding benefits to the shareholders.

The impact on firm value is a puzzling question to address. There is mixed evidence supporting the view of enhancing, diminishing or even maintaining the same value. This may be due to the way boards are created (Board Hypothesis, Ahern and Dittmar (2012) or because firms have not yet achieved the critical mass and, so, are not fully experiencing the gender effect (Kramer et al., 2006). Additionally, board members that were created on the "old boys club" may praise the traditional ways and suppress any contribution that arises from unconventional directors. Therefore, the possible gains that come from gender diversity may not be realized or reflected in any measure of firm's performance or value (Rose, 2007).

³² Carter et al. (2010) supports this view, after they found no relation between firm value and the percentage of female directors, on the largest US companies.

³³ Before the quota, French directors were mostly from the "Le Grand École", an elite education establishment where women were very underrepresented (Ferreira et al., 2007).

3. HYPOTHESES AND METHODOLOGY

In this section, I develop the hypothesis of study and explain the methodology and models used to test them. Adams and Ferreira (2009) present a model that fits closely the purpose of my research. Their study analyses the impact of a higher percentage of female directors on four main corporate governance aspects: Attendance at the meetings, CEO turnover, CEO equity-payment and Director equity-payment. Furthermore, they study the overall impact on firm value: Tobin's Q.

The first aspect of corporate governance that is considered is the level of attendance at the meetings. Adams and Ferreira (2009) consider that this is the main occasion where directors can retrieve information to develop their duties. Thus, more attendance to the board may develop a more informed decision-making that will lead to an additional effective monitoring role.

Secondly, I analyse the impact on CEO turnover. According to Weisbach (1988), when boards have more independent directors, the likelihood of firing a CEO after a period of poor stock performance is higher. Therefore, since women are known as tougher monitors, as well as independent, this turnover should be more sensitive (Adams & Ferreira, 2009).

Additionally, I study the equity-based compensation of both directors and CEO. It is known that a performance-based compensation serves the purpose to align the interests of the CEO to the ones of the shareholders (Becht et al., 2005). Therefore, if this idea is extended to the directors composing the board they will also become more driven to fulfil their duties and protect the shareholders' interests (Adams & Ferreira, 2009).

Finally, and focusing more on the main purpose of this dissertation, I study the impact of more women in the board on firm value. As suggested by the previous literature, there is a wide range of results, either positive (Campbell & Minguez-Vera, 2008), negative (Adams & Ferreira, 2009) or insignificant (Rose, 2007).

Corporate governance is used as a way to enhance firm value and, therefore, every possibility of improvement is a subject of study. Even though this can raise shareholder value (Hermalin & Weisbach, 2001), too much monitoring can, in the end, harm financially the company (Almazan & Suarez, 2003).

3.1 Hypotheses Development

Based on the literature reviewed above, and focusing more closely the study of Adams and Ferreira (2009), I formulate the following hypotheses:

H1: Gender diversity leads to a higher level of attendance at the board meetings.

Since women are normally seen as tokens, they want to show themselves as valuable (Kanter, 1977). The literature suggests that women tend to put more effort into their tasks, being the attendance at meetings a visible way to do it. So, more women on board will have a positive effect on the overall level of attendance to meetings.

H2: Gender diversity increases the likelihood of CEO turnover after poor stock performance.

According to the existing literature, a higher level of board independence increases the likelihood of replacement of the CEO, after a period of poor stock performance. Since women are normally from outside the “old boys club”, they approach more on the theoretical concept of independent directors (Adams & Ferreira, 2009). Thus, a higher level of their presence in the board should increase the probability of firing the CEO when the company is performing poorly due to the manager’s choices.

H3: Gender diversity is more associated with the use of equity-based compensation for the CEO.

The literature so far explains that when a CEO has equity-based compensation their interests are more aligned with the shareholders. Their actions begin to impact them directly and their focus shifts more to the performance of the company since they will benefit from it. The advocates of these compensation schemes are the independent directors that are present in the board because it eases their job in defending the owners of the firm (Adams & Ferreira, 2009). Previous studies suggest that women are more independent, therefore positively influencing the incorporation of this compensation on the CEO’s contracts.

H4: Gender diversity is more associated with the use of equity-based compensation for the directors.

Understanding the premise of the previous hypothesis, the same principle can be extended to the compensation of the directors. Adams and Ferreira (2009) argue that directors also need to be encouraged to perform a respectable job. Therefore, since women are seen as tokens and tend to push themselves harder to achieve higher individual performance (Kanter, 1977), they should be more comfortable in having an equity-based compensation.

H5: Gender diversity has a positive impact on firm value.

The existing empirical evidence on the impact of board gender diversity on firm value is mixed. However, since most of the studies show that women positively impact the corporate governance of the company, that should increase the effectiveness of the monitoring roles. Thus, a more effective control over the CEO's decisions should occur, leading to a higher value and financial performance of the company.

3.2 Methodology and Variables Specification

In this subsection, I present the models used to conduct my research and the specific variables used to test every hypothesis above stated.

A. Level of Attendance at the Meetings

The first hypothesis to be tested is the impact of gender diversity on the level of attendance at the board's meetings. This analysis is supported by Adams and Ferreira (2009), who explain that women are expected to behave differently from men since they try harder than them. Thus, representing the meetings the primary source of information for the directors to carry out their duties, it is expected that women attend more to these events in order to make more informed decisions and perform a stricter monitoring role. To test the first hypothesis, I estimate the following model:

$$Attendance_{i,t} = \alpha + \beta_1 Female_{i,t} + \beta_2 Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the dependent variable, $Attendance_{i,t}$ ³⁴, is the average aggregated percentage of attendance of all directors on the board to all the meetings in year t for firm i . $Female_{i,t}$ is the percentage of female directors on the total number of directors composing the board for firm i in year t . The model includes a set of control variables, in accordance with Adams & Ferreira (2009). For instance, I consider three board-level controls ($NrMeetings_{i,t}$, $BoardSize_{i,t}$ and $IndependentDir_{i,t}$) and four firm-level controls ($LogSales_{i,t}$, $MBV_{i,t}$, $ROA_{i,t}$ and $Volatility_{i,t}$). $NrMeetings_{i,t}$ is the total number of meetings in a year. $BoardSize_{i,t}$ is the number of directors composing the board. $IndependentDir_{i,t}$ is the percentage of directors that are classified, by the company, as independent over the total number of directors composing the board. $LogSales_{i,t}$ is calculated as the natural logarithm of the net sales. $MBV_{i,t}$ is

³⁴ A limitation of this dissertation regarding the study of Adams and Ferreira (2009) is that I can only have the aggregate level of the board attendance, while the authors have the individual level of attendance for each director and so they can fully understand the impact of women directors on male directors' behaviour. Since this criterion is not available in Thomson Reuters Eikon nor on Bureau van Dijk Database, it limits the extent of my analysis.

measured as market value of Equity divided by the book value of Equity. $ROA_{i,t}$ is measure as the EBIT to Total Assets. $Volatility_{i,t}$ is the standard deviation of prior monthly stock returns in a given year and is used as a measure of risk. Finally, $\varepsilon_{i,t}$ is the independent and identically distributed error term with a mean of zero. Every variable is detailed in Appendix A, with extensive definition and source.

B. Sensitivity of CEO Turnover

Secondly, I analyse whether gender diversity on the board of director has an impact on the sensitivity of the CEO turnover after poor stock performance periods. Again, Adams and Ferreira (2009) support this view since independent directors tend to be tougher when the time comes to replace the manager. As women are supposed to be more independent they should, therefore, have an even higher impact on CEO turnover after poor performance. To test the second hypothesis, I estimate the following model:

$$CEOTurnover_{i,t} = \alpha + \beta_1 Female_{i,t} + \beta_2 FemaleStock_{i,t} + \beta_3 StockPerform_{i,t} + \beta_4 Controls_{i,t} + \varepsilon_{i,t} \quad (2)$$

where dependent variable $CEOTurnover_{i,t}$ is a dummy variable that equals 1 when a new CEO enters to the company and zero otherwise. $Female_{i,t}$ continues to have the same meaning as in equation (1). $StockPerform_{i,t}$ represents the annual return of the company's shares minus the annual return of the market. $FemaleStock_{i,t}$ is the product of the coefficients of the previous two variables, representing the sensitivity on the dependent variable.

Besides the board-level controls ($BoardSize_{i,t}$ and $IndependentDir_{i,t}$) and the firm-level controls ($LogSales_{i,t}$ and $Volatility_{i,t}$), here I included CEO characteristics to control for those differences ($CEOAge_{i,t}$, $CEOTenure_{i,t}$ and $CEOChairman_{i,t}$). $CEOAge_{i,t}$ is the age of the CEO. $CEOTenure_{i,t}$ is the number of years that the CEO has been holding the position. $CEOChairman_{i,t}$ is a dummy variable that has the value of one when the individual holds both CEO and Chairman of the Board's positions at the same time. More extensive detail can be found in Appendix A.

C. Impact on CEO's Compensation

Mehran (1995) finds that more independent boards increase the performance-based compensation of the CEO. Adams and Ferreira (2009) argue that women should increase this type of compensation in order to stimulate the CEO to respond to the right incentive. To test the thirds hypothesis, I estimate the following model:

$$CEOPay_{i,t} = \alpha + \beta_1 Female_{i,t} + \beta_2 Controls_{i,t} + \varepsilon_{i,t} \quad (3)$$

where the dependent variable $CEOPay_{i,t}$ ³⁵ is a dummy variable that gives value of one if the CEO has any type of performance-based or equity-based aspect in his compensation structure and zero otherwise. The control variables are the CEO ($CEOAge_{i,t}$, $CEOTenure_{i,t}$ and $CEOChairman_{i,t}$), board ($BoardSize_{i,t}$ and $IndependentDir_{i,t}$) and firm characteristics ($LogSales_{i,t}$, $MBV_{i,t}$, $ROA_{i,t}$ and $Volatility_{i,t}$). Further detail can be consulted in Appendix A.

D. Impact on Director's Compensation

If female directors have a positive impact on incorporating equity-based compensation for the CEOs, then they may have an important impact on the directors' compensation as well. The idea is the same as on the previous hypothesis, only being extended to the constituents of the board of directors. Adams and Ferreira (2009) argue that more equity-based compensation should encourage directors to put more effort into their monitoring activities. Since women work harder to prove their value (Kanter, 1977), they should be more open to this kind of compensation. Therefore, the compensation structure should change in order to incorporate this portion. To test this fourth hypothesis, I estimate the following model:

$$BoardPayMethod_{i,t} = \alpha + \beta_1 Female_{i,t} + \beta_2 Controls_{i,t} + \varepsilon_{i,t} \quad (4)$$

where the dependent variable $BoardPayMethod_{i,t}$ ³⁶ is a dummy variable that gives the value of 1 if there is any link between the directors' compensation and long-term objectives or equity options and zero otherwise. The controls used here are board-level ($BoardSize_{i,t}$ and $IndependentDir_{i,t}$) and firm-level ($LogSales_{i,t}$, $MBV_{i,t}$, $ROA_{i,t}$ and $Volatility_{i,t}$). For more detail, see Appendix A.

E. Firm Value

Lastly, one of the main focuses of this dissertation is the impact of gender diversity on firm value. Though previous literature gives mixed results, the main belief is that women increase the corporate governance of the companies (Adams & Ferreira, 2009). Therefore, a better and more efficient control of the CEO should help the company reduce the situations when the manager's actions deviate, ultimately increasing its value and financial performance. To test this fifth hypothesis, I estimate the following model:

³⁵ Here I found another limitation regarding Adams and Ferreira (2009) research. They possessed data about the percentage of the total compensation that was linked to the performance of the company. However, Thomson Reuters Eikon does not provide this kind of information, allowing me to know only if there is equity-based compensation or not.

³⁶ Again, I experience the same kind of limitation as on the previous hypothesis. Adams and Ferreira (2009) possess data that gives a value for the percentage of compensation that is linked to long-term performance, while in Thomson Reuters Eikon there is only the option to know if that link exists or not.

$$\text{LnTobin}_{i,t} = \alpha + \beta_1 \text{Female}_{i,t} + \beta_2 \text{Controls}_{i,t} + \varepsilon_{i,t} \quad (5)$$

where the dependent variable $\text{LnTobin}_{i,t}$ is the natural logarithm of the variable $\text{Tobin}Q_{i,t}$. $\text{Tobin}Q_{i,t}$ is measured as market value of firm (Total Assets minus Book Value of Equity plus Market Value of Equity) divided by the book value (Total Assets). Control variables are used on board-level ($\text{BoardSize}_{i,t}$ and $\text{IndependentDir}_{i,t}$) and on firm-level ($\text{LogSales}_{i,t}$, $\text{ROA}_{i,t}$ and $\text{Volatility}_{i,t}$). For more information, consult Appendix A.

3.3 Methodology Concerns

When analysing this type of panel data some concerns arise, that must be taken into consideration, because they can mislead the results. First, there is the existence of unobservable time-invariant characteristics of firms, industries, and countries and the unobservable cross-sectional yearly macroeconomic trends that can lead to some correlation between governance measure/firm value and gender diversity. To control for these features and for changes in macroeconomics events, I include in my regressions a specific structure of fixed effects³⁷, which are supported by Hausman tests presented in Appendix D. Secondly, there is also the likelihood of endogeneity, the possibility that some events or firm characteristics (such as firm value or director compensation) may influence the incentives for women to apply for a specific company or for that company to decide to have more women in their board. These concerns are addressed using an estimation in two steps (two-stage least squares) with an instrumental variable (IV) that explain the variation in the percentage of women in the board but is not correlated with the relevant dependent variables of the models. In this procedure, I use the enactment of legislation requiring a minimum level of gender diversity as the instrument. In section 5 this procedure is explained in more detailed. Finally, to adapt my results to the presence of heteroskedasticity, standard errors are corrected as White-robust. When the dependent variable is a dummy, I will estimate a probit model, showing marginal effects, with the previous adjustments included.

³⁷ This structure of fixed effects focuses mainly on a Nation, Industry and Year fixed effects rather than Firm and year fixed effects for reasons that will be addressed in the Results Section.

4. DATA DESCRIPTION

4.1 Data availability

To test all the hypotheses previously stated and to evaluate the relations between the corporate governance measures/firm value and the gender diversity on the board it is mandatory to access a database that yields a vast information for these variables. However, even with a lot of data displayed the final construction of the sample presented some challenges since data had to be retrieved from 3 different databases and merged together. Moreover, some data had to be achieved manually due to its straightforwardness unavailability.

The core of this dissertation will be constituted by the publicly traded companies since these companies largely comply with the disclosure of board-level information, that is necessary to conduct the research. They must, also, be covered by the Asset4 database (available from Eikon Thomson Reuters), which aggregates this information. The geographic area of focus will be Europe, due to its large acceptance of passing legislation that imposes a minimum percentage of women on the board of directors and, thus, is shifting the way firms hire and conduct their dynamics. Also, only for Europe I was able to access a database that allowed me to have information about the CEOs for the companies, their tenures and the point in time when they were replaced.

Until now, not much research has been developed with this level of detail. Adams and Ferreira (2009) were the first to test the direct impact of gender diversity on the various mechanisms of corporate governance.

4.2 Sample Construction

The initial sample of this dissertation consisted of an unbalanced panel data for the firm and board-level information from all the 1091 companies composing the Asset 4 Europe database. The period of analysis goes from 2005 to 2016. Due to the recency of the database, prior to 2005 there are many missing data points. I started with this first dataset from Asset4, that gave me the board-level information and merged it with the financial data available from WorldScope. Finally, in order to have the CEO characteristics and turnover, I had to access Bureau van Dijk's Amadeus database, retrieve the information and then merge it with my original sample. The use of WorldScope instead of Amadeus for financial information was more appropriate since both Asset4 and WorldScope data are retrieved from the same source, Thomson Reuters Eikon, and therefore come in the same format.

Due to the large disparity of currencies across Europe, a common currency was selected to standardize all the financial information. I used the United States dollar (\$) since it would ease the subsequent process of control the financial data for the presence of inflation³⁸.

For each database, I retrieve specific information. From *WorldScope*, I obtained financial information: *Book Value of Equity*, *Market Value of Equity*, *Total Assets*, *EBIT* and *Sales*. From *Asset4*, I collected board-level information: *Independence*, *Attendance*, *Female*, *BoardSize*, *Meetings*, *Governance Level*, *CEO Duality* and *Compensation Structure*. The need for some data that was not directly available lead to some significant work of data management. *Volatility* was computed as the historical volatility, using the standard deviation of monthly stock returns over the past 48 months including the current year³⁹. *Stock Performance* is calculated using the Buy-and-Hold Abnormal Returns (BHAR)⁴⁰ approach, the difference between the annual buy-and-hold return on the stock minus the annual buy-and-hold return on the benchmark⁴¹. This calculation was restricted to companies that had a full civil year of monthly returns for the year in the analysis. *Tobin's Q*, used as the market-based performance measure, was achieved as the market value of the company (book value of assets – book value of equity + market value of equity) divided by the book value of the company (book value of assets). *MBV*, used as secondary market-based performance measure⁴², is calculated as the ratio of the market value of equity by the book value of equity. *ROA*, used as the profitability measure, is calculated as the ratio of *EBIT* divided by the *Total Assets*. These two measures of firm value/profitability were calculated as in Adams and Ferreira (2009). More detailed information and definitions can be found in Appendix A.

Finally, to obtain the *CEO Turnover* variable and its characteristics (*CEO Age* and *Tenure*) there was the need to access other databases. From *Amadeus*, I was able to find some information for the current and previous CEOs. However, this information was highly incomplete, missing companies and lacking many previous managers. Therefore, I conducted a more thorough research using the publicly available

³⁸ For this it is commonly used the CPI indexes. These indexes are normally performed by International institutions, which use the United States dollar as currency.

³⁹ Depending on data availability, the number of months used to compute the standard deviation of stock returns can be lower than 48, with a minimum of 24 months.

⁴⁰ As defended by Barber and Lyon (1997), the approach by BHAR is more suitable to analyse and detect long-run abnormal returns. Moreover, it gives more unbiased predictors, which translates into more correct inferences.

⁴¹ For this purpose, Thomson Reuters Eikon *DataStream* provides country indexes (DS markets) to be served as benchmarks for each of my companies.

⁴² This way it is possible to include a market performance measure as a control variable that is not a focus of the study, as it would happen if I used Tobin's Q.

information⁴³ for my sample of companies. From here, I created a dummy variable assuming the value of 1 when a new manager took office and zero, otherwise. I cleaned the data for events that befell upon the managers and lead to an obligated turnover (death or health reasons). Moreover, I identified the turnovers that occurred due to retirement events and calibrated the variable *CEO Retire* (its importance will be detailed in the Results Section). The appointment of interim CEOs was not considered for this variable. In the specific case of co-CEOs, each time one of the managers was replaced I counted it as a turnover. For mergers and acquisitions happening during my time-period, I searched for the one that stayed as a ruler of the other and computed the CEO turnover for that company in the prior-M&A period. During this process, date of birth of each manager and the year he entered in charge were also collected, providing me with the possibility of producing the variables *CEO Age* and *CEO Tenure*, respectively. In *CEO Tenure* variable, the year the manager takes office counts as 1 year in charge.

To avoid biases created by the presence of outliers, I follow the approach of Duchin et al. (2010) and Ferreira et al. (2017) and winsorize the data at the 1% tails of the distributions⁴⁴. To account for the effect of inflation, as in Adams and Ferreira (2009), I adjusted the dollar-denominated variables to reflect constant prices. The variables were adjusted using the US Consumer Price Index based on 2016 prices that are provided by the World Bank.

To reach my final sample some filters were applied: (i) Firm's Total Assets value of at least 10 million US\$; (ii) Do not belong to the Financial Sector (due to the differences in the accounting principles and measures that impact and give other meaning to the firm value and profitability measures); (iii) Do not belong to Utilities Sector (since they are highly regulated companies their performance is very stable, being hard to analyse the impact on firm value); (iv) Do not belong to any "fiscal off-shores" (Guernsey, Jersey, Bermuda, Isle of Man and Gibraltar); (v) Have available DS market for benchmarking (Ukraine taken out); (vi) Do not have negative or a zero level of Sales; (vii) Have information for every variable (Therefore constituting a sample that will remain constant throughout my different analysis).

At last, I restricted my sample for companies that had at least five firm-year observations. This restriction was included to avoid the appearance of companies with very reduced observations on my panel data. Ended up with 4383 firm-year observations from 19 European countries.

⁴³ The main sources used were the annual reports of each company, company publications, *Bloomberg* website, *Reuters* website and *Linked In*.

⁴⁴ This winsorize process was conducted for every variable, except the ones assumed as dummy or score. For more detail about those variables consult Appendix A.

4.3 Summary Statistics

This subsection shows the descriptive statistics of the variables used in this study. From Table 1, we observe that average sales of the sample firms are \$13billion. Moreover, there is evidence suggesting that companies have faced challenging periods since its stock performance is relatively poor, with the mean being negative (-0.004) and showing a reduced level of ROA (0.09). Attendance at the meetings is high (93.64%) with 99% of all firm-year observations providing long-term objectives' incentives in the compensation structures of their directors and 78% having the presence of at least one female on board. Additionally, the average of female on board is of 16.52% far from the mean of Independent Directors (51.98%), meaning that independent male directors still highly dominate the board. The CEO is also the Chairman of the Board in 26% of the observations, having a portion of its compensation linked to the shareholders' return in 50% of the cases. Lastly, in my sample period, 506 replacements of CEO occur (approximately 12%) with 177 of those being due to retirement, leading to an average tenure of 6.79 years.

Table 1 – Summary Statistics

This Table presents the statistics on my sample that consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters DataStream/ WorldScope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. Tobin's Q is the ratio of the firm's market value (Total Assets minus Book value of Equity plus the Market value of Equity) by its book value (Total Assets). MBV is calculated as Market Value of Equity by Book Value of Equity, ROA is calculated as EBIT divided by Total Assets. Volatility was calculated as the historical volatility of monthly stock returns in the past 48 months. Stock Performance was calculated following the BHAR approach. Independence level is retrieved on Thomson Reuters, as the level reported by the company. CEO Pay is a dummy indicating if the CEO has its compensation linked to the shareholders' return. BoardPayMethod is a dummy indicating if the directors' compensation is linked with long-term objectives or stock options. FemalePresence is a dummy indicating if the firm has at least one women on board. CEORetire indicates if the turnover that occurred was due to retirement. All variables are defined in Appendix A. All dollar-denominated variables are adjusted to reflect 2016 prices. All variables that were not defined as scores or dummies, are winsorized at 1% and 99% levels.

Variables	Firm-Year Observations	Mean	Median	Standard Deviation	Min	Max
<i>Firm Characteristic</i>						
Sales (\$ Million)	4383	13188	4027	23745	7.72	138863
LogSales	4383	8.40	8.30	1.52	2.59	11.84
ROA	4383	0.09	0.08	0.09	-0.26	0.43
MBV	4383	2.78	2.09	2.90	-2.45	17.90
StockPerform	4383	-0.004	0.023	0.32	-1.21	0.80
TobinQ	4383	1.69	1.43	0.90	0.60	6.12
Volatility	4383	0.71	0.63	0.31	0.26	1.90
<i>Board Characteristic</i>						
Attendance	4383	93.64	96	7.97	4	100
BoardPayMethod	4383	0.99	1	0.11	0	1
BoardSize	4383	10.39	10	3.50	4	23
CEOChairman	4383	0.26	0	0.44	0	1
Female	4383	16.52	14.29	12.76	0	66.67
FemalePresence	4383	0.78	1	0.41	0	1
IndependentDir	4383	51.98	53.85	23.22	0	100
NrMeetings	4383	8.95	8	3.36	4	27
<i>CEO Characteristic</i>						
CEOAge	4383	53.83	54	6.68	32	81
CEOPay	4383	0.50	1	0.50	0	1
CEORetire	4383	0.04	0	0.20	0	1
CEOTenure	4383	6.79	5	6.22	1	55
CEOTurnover	4383	0.12	0	0.32	0	1

4.4 Sample and Gender Distribution

In this subsection, I provide a broader overview of the distribution of my sample and subsequently the distribution of gender diversity by year, country and industry.

The Industry distribution was constructed using the Fama and French 12-Industry classification⁴⁵. Due to the restrictions applied there are only 10 different sectors. The Manufacturing sectors represent 17% of my sample, followed by Wholesale and Retail sectors with 14%, Consumer Non-Durables with 10% and all the others with percentages from 3% to 7%. The remaining sample (25%) is classified as Other Sectors. For more detail, consult Appendix B, Figure 2.

In terms of Nation, the sample covers 19 different European countries. Here, the United Kingdom represents 44.1% of my sample, followed by France (16.22%), Sweden (6.48%), Germany (5.16%), Finland (5.13%), Switzerland (4.97%), Belgium (3.40%), Italy (3.31%), Ireland (3.19%) and the Netherlands (3.01%). The remaining nations hold individual distributions between 0.14% and 1.55%. For further detail, see Appendix B, Table 10.

As expressed in Table 2 below, the percentage of board seats occupied by women has increased by 262.32% over the period under analysis, a massive growth from 2005 (7.39%) to 2016 (26.78%). This evolution is in line with the study performed by Egon Zehnder (2016) that shows similar values for the period they analysed (2012-2016). Furthermore, women have been able to penetrate new entities elevating the percentage of companies with at least one female on board from 48.55%, in 2005, to 95.32% in 2016. Thus, in my sample, women were able to conquer their space and to expand this culture into almost all the companies in the analysis, remaining only a few (4.68%, in 2016) that still resist to this ideology. This increase in female participation in the board has led to an increase in critical mass achievement by the companies' boards per year. From 2005 to 2016, this level of achievement has increased from 4.62% to 49.51%, a rise of 970.6%. However, in terms of firm-year observations, this level remains low at 26.17%, more detail in Appendix E, Table 19.

When examining gender diversity by industry we can see that female directors occupy an equal percentage of board seats in all different sectors (a level between 16% and 19% for percentage of female and 76-86% of companies that have at least one woman on board). Besides the Oil, Gas and Coal and

⁴⁵ The Fama and French 12-Industry classification is only used when addressing the sample and gender distribution. For regression purposes the industry classification used is the 2-digit Sic Code, that is further developed in the next section.

Business Equipment sectors (that have a female representation of 14.2% and 14.46%, and therefore appear on the tail of the analysis), there is no evidence of a particular industry that discriminates women directors, comparing to others, indicating that the evolution is occurring at an overall level⁴⁶.

Finally, when addressing the *status quo* by Nation some concerns arise, because some countries possess few observations that leads to a biased idea of the overall picture⁴⁷. Knowing this, I can reanalyse Table 12 in Appendix B and understand that in the top five countries, in terms of gender diversity, 4 of them have a legislation imposing a minimum level of gender diversity. I, therefore, argue about the high efficiency that mandatory or even more voluntary quotas⁴⁸ have in the increase of female director's opportunities and offers.

Table 2 – Gender Diversity Evolution (by year)

This table presents the statistics on my sample that consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. The evolution presented is structured by year to see the impact of the change in corporate culture and dynamics across time. Female accounts for the percentage of female directors composing the board. FemalePresence is a dummy indicating if the firm has at least one women on board. Both variables appear in the percentage format. All variables are defined in Appendix A.

Year	Female	FemalePresence
2005	7.39%	48.55%
2006	7.76%	51.11%
2007	8.67%	53.20%
2008	9.37%	60.13%
2009	10.18%	63.51%
2010	12.83%	73.26%
2011	14.61%	78.00%
2012	17.26%	84.88%
2013	19.48%	88.91%
2014	22.40%	93.44%
2015	24.47%	94.81%
2016	26.78%	95.32%

⁴⁶ For more detail, please consult Table 11 in Appendix B.

⁴⁷ In here, I am referring to Greece and Hungary, that do not possess any kind of quota and have few observations but that appear on the top in terms of gender diversity. This way they should not be considered for the analysis performed in this section.

⁴⁸ Voluntary quotas are referring to the quotas applied to which the non-compliance of it leads to insignificant consequences, contrarily to Norway (where the non-compliance would lead to the dissolution of the company).

4.5 Differences between firms with and without Female directors

Here, I will perform a quick view of the differences that emerge between companies due to the presence or absence of female directors. The purpose is to give a first perspective of the possible impact of gender diversity on some parameters of the company.

Table 3 – Comparison of Firms with Female directors to those without

This Table displays the summary statistics for some firm-level and board-level information as an average for firms with and without female directors (Panel A) and its univariate differences (Panel B), for the sample of complete data that yielded the intersection between Amadeus, WorldScope and Asset4 (4383 firm-year observations). Tobin's Q is the ratio of the firm's market value (Total Assets minus Book value of Equity plus the Market value of Equity) by its book value (Total Assets). ROA is calculated as EBIT divided by Total Assets. Volatility was calculated as the historical volatility of monthly stock returns in the past 48 months. Stock Performance was calculated following the BHAR approach. All variables are defined in Appendix A. The univariate differences between the two categories of firms are based on t-tests, for the difference in means, and on rank-sum (Wilcoxon Z-statistics), for the difference in medians. All dollar-denominated variables are adjusted to reflect 2016 prices. All variables that were not defined as scores or dummies, are winsorized at 1% and 99% levels. The symbols ***, **, * report statistical significance at 1%, 5% and 10% levels, respectively.

Panel A – Means and Medians for each section

	Mean for Firms-Years without female directors, obs= 956		Mean for Firm-Years with female directors obs= 3427	
	Mean	Median	Mean	Median
LogSales	7.78	7.65	8.57	8.47
Tobin's Q	1.66	1.44	1.69	1.43
ROA	0.10	0.09	0.09	0.08
Volatility	0.77	0.71	0.69	0.62
Stock Performance	-0.003	0.041	-0.004	0.018
Board Size	8.83	8	10.82	10
Independence	50.52	50	52.38	54.55

Panel B – Test of Differences

	Differences in Mean (with – without female directors)	Differences in Median (with – without female directors)
LogSales	0.79 ***	0.82 ***
Tobin 's Q	0.03	-0.01
ROA	-0.01 **	-0.01 ***
Volatility	-0.08 ***	-0.09 ***
Stock Performance	-0.001	-0.024
Board Size	1.99 ***	2 ***
Independence	1.86 **	4.55 ***

In Table 3, I perform a comparison of firm and board-level characteristics across firms-years with at least one female on board and firms-years without any gender diversity on board. I report the univariate results in Panel A and the test for difference in medians and means in Panel B. To test for the difference in means I used the t-statistics whereas for the difference in medians I used the Wilcoxon rank-sum z-statistics. The results show that in firms where women are present on board the companies tend to have higher sales (1% significance), higher level of independence of the board (5% significance for means and 1% significance for medians) and a superior stability (since volatility is reduced, with a 1% significance). The differences regarding the independence level are consistent with the idea that women carry a stronger sense of independence, while the statistically significant increase on board size suggest that women enter the board but are not yet seen as a viable way to replace male directors. The difference in terms of firm value (Tobin's Q) and firm performance (Stock Performance) shows no statistical significant values. Finally, it seems that the presence of women on the board of directors, reduces the firm's profitability, with a decrease in ROA. These outcomes suggest some sample selection effect, since there is a higher presence of women in firms with certain characteristics before mentioned. In the next section, I will further develop my hypotheses with the necessary control variables to enhance the accuracy of my results.

5. EMPIRICAL RESULTS AND DISCUSSION

In order to analyse the impact that gender diversity has on the company, herein I examine how the governance characteristics of the company and firm value behave with different percentages of women on board of directors. In the next subsections, I am going to display the estimates retrieved from the equations performed and discuss the different impacts predicted.

5.1 Corporate Governance: Analysis of Results

For this section, I use the models detailed in section 3 for each of my hypothesis in analyses. All models include year fixed effects and either firm or industry and country fixed effects, as specified in the Tables. As in Adams and Ferreira (2009), I use the 2-digit Sic Codes to classify industries. Following the approach of Adams and Ferreira (2009) and Hermalin and Weisbach (2001), I performed the Hausman test for each of the regressions in the analysis. The results of the test revealed the need to include fixed effects' models. Furthermore, I performed the Breusch-Pagan test, whose outcomes showed the presence of heteroskedasticity. Regarding the IV method, it was also performed a test concerning the quality of the instrumental variable: it should be significant when estimating the endogenous variable but insignificant with the residuals of the two stages of the IV. Quota demonstrated to be a good instrumental variable, being robust for the presence of firm and year fixed effects. The tests can be consulted in Appendix D.

A. Impact on the Attendance at the Board Meetings

First, I analyse the effect of board's gender diversity on one of the easily observed board aspects: the attendance level at the meetings. This is the primary source of information for the directors to carry out their duties. Therefore, a higher attendance at these events should be related to a more thorough monitoring over the CEO.

Table 4 displays the estimates performed to address the first hypothesis of my dissertation: the impact of gender diversity on the level of attendance at the board meetings. The dependent variable is the aggregate percentage of the attendance of all board members. In columns (1) and (2), the variable of interest is the dummy FemalePresence. Here, I intend to test the impact merely of the presence of women on the board's attendance. In columns (3) and (4), this previous variable is replaced by the percentage of women in the board (Female) to make a deeper analysis of the effects of diverse levels of gender

diversity. All regressions include controls for firm and board-level features. There are no multicollinearity issues among the variables used for this regression, see Table 13 Appendix C. The Hausman and Breusch-Pagan tests indicate the need to include fixed effects and use White-robust standard errors in the regressions below. For more detail, consult Appendix D.

Table 4 – The impact of gender diversity on the level of Attendance to the meetings

The Table presents the outcomes of the regressions performed to address the first hypothesis of my dissertation: the impact of gender diversity on the level of attendance at the board meetings. The sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. The dependent variable (Attendance) is the aggregate percentage of the attendance of all board members. FemalePresence is a dummy variable, yielding 1 if there are at least one women on board and zero otherwise. Female accounts for the percentage of female directors composing the board. All variables are defined in Appendix A. Columns (1) and (3) report the regressions specified for Nation and Industry, 2-digit sic code, fixed effects. Columns (2) and (4) are performed using firm fixed effects. All columns include year dummies. All dollar-denominated variables are adjusted to reflect 2016 prices. In parenthesis, it is presented the White-robust t-statistics, corrected for the presence of heteroskedasticity. All variables, except FemalePresence and Female, are winsorized at 1% and 99% levels. The symbols ***, **, * report statistical significance at 1%, 5% and 10% levels, respectively.

Attendance	(1)	(2)	(3)	(4)
FemalePresence	1.2404*** (3.63)	1.0838*** (3.13)		
Female			0.0327** (2.55)	0.0425*** (2.81)
NrMeetings	-0.0838*** (-2.59)	-0.1777*** (-4.86)	-0.0854*** (-2.64)	-0.1825*** (-5.01)
BoardSize	-0.2373*** (-3.86)	-0.1220 (-1.43)	-0.2144*** (-3.42)	-0.1120 (-1.29)
IndependentDir	0.0151** (2.12)	0.0062 (0.65)	0.0150** (2.11)	0.0053 (0.56)
LogSales	0.0430 (0.33)	-0.4861 (-1.21)	0.0532 (0.40)	-0.4316 (-1.09)
MBV	0.0203 (0.063)	-0.0136 (-0.42)	0.0250 (0.78)	-0.0109 (-0.33)
ROA	3.2167** (2.46)	2.6329* (1.91)	3.1414** (2.41)	2.4773* (1.80)
Volatility	-0.4212 (-0.84)	-0.9785 (-1.63)	-0.4052 (-0.80)	-0.9575 (-1.60)
Constant	98.0761*** (18.10)	95.9487*** (34.59)	98.5288*** (18.14)	95.7119*** (34.77)
Observations	4383	4383	4383	4383
R ²	0.267	0.547	0.266	0.547
Adjusted R ²	0.252	0.49	0.251	0.49
Nation & Industry Effects	Yes	No	Yes	No
Firm Fixed Effects	No	Yes	No	Yes
Year Dummies	Yes	Yes	Yes	Yes

Both in columns (1) and (3), the coefficients on the variables of interest – FemalePresence and Female - are a positive and statistically significant. Accordingly, when companies have female directors on their boards their Attendance at Meetings is, on average, 1.24 percentage points higher. Moreover, one percentage point increase in Female leads, on average, to an increase of 0.033 percentage points on the Attendance at Meetings. This supports the view that women tend to be more assertive in complying with their obligations as directors. Columns (2) and (4) were specified, with firm fixed effects, controlling the results for the presence of omitted variables that could influence the results. The coefficients for Female and FemalePresence remained positive and statistically significant, at 1% level. Thus, the results supported the argument of Adams and Ferreira (2009) that women do behave differently than male directors. Since my data does not provide information at the individual level⁴⁹, it is not possible to analyse any impact on male director's behaviour. I hypothesize the two possible effects on women on board. Attendance may increase due to: (1) women attend more and influence the male directors to follow their patterns or (2) women attend more, do not affect male directors' behaviour, but, since they are in higher percentage, they elevate the aggregate level of attendance⁵⁰. Nonetheless, the results are positive and are also consistent with some literature that argues that women tend to be intrinsically different than men (Croson & Gneezy, 2004) and that by being tokens tend to push themselves harder to achieve higher individual performance (Kanter, 1977).

B. Impact of Sensitivity of the CEO Turnover

Being the above-stated effect of women on attendance significant, this could mean that they could increase the monitoring intensity of the board. Accordingly, Weisbach (1988) defends that one measure of the intensity of board monitoring is the sensitivity of the CEO turnover prior a poor stock performance. That will be the focus of this subsection.

Table 5 displays the probit estimates performed to address the second hypothesis of my dissertation: the impact of gender diversity on the likelihood of CEO Turnover, after poor stock Performance. The dependent variable - CEOTurnover - is a dummy that receives the value of 1 when a new CEO takes the

⁴⁹ A major limitation regarding the study of Adams and Ferreira (2009).

⁵⁰ Regarding these hypotheses, I performed several regressions to assess the possibility of a non-linear relation that might shed some light. However, I found no evidence of it.

office, and zero otherwise. These events do not consider turnovers that happened due to death, health reasons or retirement. Sometimes, the retirement reasons were dubious, and it was more efficient to drop those observations and analyse only the turnovers that were explicitly occurring because the CEO was dismissed. A variable regarding the gender of the CEO was not performed since women accounted for only 2.3% of all managers in my sample. Also, they tend to stay for short periods in charge, leading to an even lower percentage if put in firm-year observations. In the regressions, all variables have a one-year lag to analyse the impact of the past firm's performance on the subsequent CEO's dismissal. Due to this, all information regarding the turnovers in 2005 is lost. In column (1), the variable of interest is Female, to see the impact of women on CEO Turnover. In columns (2) and (3), the focus is the variable FemaleStock and IndependentStock, which are the interaction between of the variables Female and StockPerform and Independent Directors and StockPerform, respectively. StockPerform is used as the one-year market-adjusted return of the company. Besides the already used control variable, all regressions are controlled for the CEO characteristics that could influence the results (Age, Tenure and Chairman). There are no multicollinearity issues among the variables used for this regression, see Table 14 Appendix C. The Hausman and Breusch-Pagan tests indicate the need to include fixed effects and use White-robust standard errors in the regressions below. For more detail, consult Appendix D.

Table 5 – The impact of gender diversity on CEOTurnover

The Table shows the marginal effects of the regressions performed to address the second hypothesis of my dissertation: the impact of gender diversity on the likelihood of CEOTurnover, after poor stock performance. The sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. The dependent variable (CEOTurnover) is a dummy variable that has the value of one when a new CEO takes the office. The sample is restricted to events that are not accounted for death, health reasons or retirement. Female accounts for the percentage of female directors composing the board. StockPerform was calculated following the BHAR approach. FemaleStock represents the product of the coefficients of Female and StockPerform. IndependentStock represents the product of the coefficients of IndependentDir and StockPerform. All variables are defined in Appendix A. All columns report regressions specified for Nation and Industry, 2-digit sic code, fixed effects. All columns include year dummies. All dollar-denominated variables are adjusted to reflect 2016 prices. In parenthesis, it is presented the White-robust z-statistics. All variables (except the ones accounted as score, dummy or related to CEO characteristics), are winsorized at 1% and 99% levels. The symbols ***, **, * report statistical significance at 1%, 5% and 10% levels, respectively.

CEO Turnover	(1)	(2)	(3)
Female	-0.0005 (-1.12)	-0.0008* (-1.87)	-0.0008* (-1.88)
FemaleStock		-0.2241** (-2.56)	-0.2152** (-2.41)
IndependentStock			-0.0424 (-0.89)
StockPerform	-0.1434*** (-11.06)	-0.1124*** (-6.31)	-0.0908*** (-3.22)
CEOAge	0.0019*** (2.71)	0.0019*** (2.66)	0.0019*** (2.64)
CEOChairman	0.0010 (0.10)	0.0003 (0.03)	0.0004 (0.04)
CEOTenure	0.0011 (1.59)	0.0011 (1.60)	0.0011 (1.61)
BoardSize	-0.0023 (-1.39)	-0.0022 (-1.35)	-0.0021 (-1.30)
IndependentDir	0.0001 (0.34)	0.0000 (0.18)	-0.0000 (-0.06)
LogSales	0.0115*** (2.94)	0.0119*** (3.05)	0.0119*** (3.04)
Volatility	0.0098 (0.58)	0.0081 (0.47)	0.0080 (0.47)
Observations	3594	3594	3594
Pseudo R ²	0.121	0.123	0.124
Nation & Industry Fixed Effects	Yes	Yes	Yes
Firm Fixed Effects	No	No	No
Year Dummies	Yes	Yes	Yes

All the models were estimated using Nation, Industry, and year fixed effects, rather than firm fixed effects with year dummies. The specification of the probit model with firm and year fixed effects was rejected, due to a poor fitting to the data. Therefore, I keep Nation, Industry and year dummies in the probit estimations.

Focusing on the analysis, in column (1), the results show an expected relation between stock performance and CEOTurnover. After periods of poor stock performance, the likelihood of replacement of the CEO increases. Taking model (1) as an example, a one percentage point decrease in stock past performance increases the probability of CEO turnover by 0.14 percentage points. The percentage of Female directors, however, does not appear to be significant in influencing the replacement of CEOs. Still, the most important aspect is not to analyse if women increase the probability of CEOTurnover but to study if they change the likelihood of CEO dismissal when there are periods of poor Stock Performance. With this, in column (2), I incorporate a variable, FemaleStock, that is the product of Female and Stock Performance. Even though a one percentage point increase in Female decreases the likelihood of CEO turnover by 0.08 percentage points, the coefficient for FemaleStock is negative and statistically. This is important because it means that a higher percentage of women in the board increases even more the likelihood of CEO Turnover after poor performance. Furthermore, in column (3), I add the interaction between the percentage of Independent Directors and the StockPerform. The variable shows a negative sign, that is expected, but fails to be statistically significant at any level. FemaleStock, however, maintained its magnitude and significance. Therefore, there is evidence suggesting that women play a key role in increasing the likelihood of dismissing a CEO after poor performance, being even more robust than the effect of Independent Directors. The results are in accordance with the study of Adams and Ferreira (2009), corroborating their theory that female directors are tougher monitors than independent male directors and thus are more severe when monitoring the CEO's responsibilities and duties.

C. Impact on the CEO's Compensation Structure

Some literature regarding the principal-agent theory argues that a fraction of equity-based compensation can provide many incentives to the CEO, aligning their goals to the shareholders' interest. This way, it represents an important mechanism of corporate governance. In this subsection, I will analyse how women impact this type of compensation.

Table 6 displays the probit estimates performed to address the third hypothesis of my dissertation: the impact of gender diversity on the CEO's compensation structure. The dependent variable, CEOPay, is a dummy variable that equals 1 when the CEO's compensation is linked to the shareholders' return. One important aspect to consider is that this analysis may suffer from endogeneity issues. It is hard to reason that attendance of the board and the sensitivity of CEO turnover will give incentives for women to join on the board of some companies. However, the structure of the directors' compensation and firm value, provide high incentives for that to happen. Here, I extend this view to the compensation of the CEO. That kind of information is presented annually on the reports of the companies. Therefore, it presents itself as a way to understand how the governance level of the company might be. Accordingly, women do not want to join a board of a company poorly governed because they do not desire to be associated with that kind of situations. If this is true, then I should control this issue by assessing an IV regression, using the instrumental variable Quota⁵¹. Further details on the importance of adapting the analysis to this issue and the choice on this instrumental variable will be discussed in the main analysis of this dissertation, "Firm Value". In columns (1) and (3), the variable of interest is Female, to assess the impact of diverse levels of gender diversity on the CEO's compensation structure. In column (4), the variable of interest is Female2, that represents the squared coefficients of the variable Female, to assess the possibility of a non-linear relation between this variable and CEOPay. In column (2), it is presented the 1st Stage of the IV regression, with the dependent variable being Female and the instrumental Quota. There are no multicollinearity issues among the variables used for this regression, see Table 15 Appendix C. The Hausman and Breusch-Pagan tests indicate the need to include fixed effects and use White-robust standard errors in the regressions below. For more detail, consult Appendix D.

⁵¹ Quota is a dummy variable that equals 1 when there is any legislation in the country, where the company is based, that requires a minimum percentage of women on the board of directors.

Table 6 – *The impact of gender diversity on the CEO's compensation structure*

The Table shows the marginal effects of the regressions performed to address the third hypothesis of my dissertation: the impact of gender diversity on the CEO's compensation structure. The sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. The dependent variable (CEOPay) is a dummy variable that equals one when the compensation structure of the CEO is linked to the shareholders' return. Female accounts for the percentage of female directors composing the board. Female2 is the squared coefficients of the variable Female. The results are controlled at the CEO level (Age, Tenure and Chairman). All variables are defined in Appendix A. All columns report the regressions specified for Nation and Industry, 2-digit sic code, fixed effects. All columns, except column (2), include year dummies. Column (2) reports the first stage of instrumental variable (IV) regression with Quota as an instrument for Female. Quota is a dummy variable that equals one when there is a legislation requiring a minimum percentage of female directors that affects the company. Columns (3) and (4) report the results of the IV estimation. The constant is omitted in column (2) to standardize with the other regressions. All dollar-denominated variables are adjusted to reflect 2016 prices. In parenthesis, it is presented the White-robust t-statistics or z-statistics. All variables (except the ones accounted as score, dummy or related to CEO characteristics), are winsorized at 1% and 99% levels. The symbols ***, **, * report statistical significance at 1%, 5% and 10% levels, respectively.

	(1) CEOPay	(2) Female	(3) CEOPay	(4) CEOPay
Female	0.0027** (2.51)		0.0041 (1.52)	-0.0147** (-1.98)
Female2				0.0005*** (2.64)
CEOAge	0.0081*** (4.52)	0.1260*** (4.63)	0.0076*** (4.23)	0.0080*** (4.39)
CEOTenure	-0.0153*** (-8.30)	0.0147 (0.51)	-0.0151*** (-8.24)	-0.0152*** (-8.25)
CEOChairman	0.0559** (2.26)	-1.7911*** (-4.68)	0.0601** (2.42)	0.0568** (2.27)
BoardSize	0.0016 (0.35)	0.2885*** (3.99)	0.0009 (0.20)	0.0010 (0.22)
IndependentDir	0.0010** (2.01)	0.0275*** (3.44)	0.0010** (2.03)	0.0010** (2.16)
LogSales	0.0533*** (5.21)	0.5136*** (3.25)	0.0540*** (5.27)	0.0561*** (5.47)
MBV	-0.0072* (-1.90)	0.2668*** (4.35)	-0.0079** (-2.03)	-0.0066* (-1.70)
ROA	-0.3789*** (-2.94)	-10.2838*** (-5.43)	-0.3375** (-2.56)	-0.4092*** (-3.05)
Volatility	0.0068 (0.16)	-5.1840*** (-8.31)	0.0209 (0.46)	-0.0077 (-0.16)
Quota		15.8531*** (27.87)		
Observations	4286	4383	4286	4286
Pseudo R ²	0.412		0.413	0.414
R ²		0.415		
Adjusted R ²		0.404		
Nation & Industry Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	No	No	No
Year Dummies	Yes	No	Yes	Yes
Regression Type	Fixed Effects	1st Stage IV with Fixed Effects	IV with Fixed Effects	IV with Fixed Effects

As mentioned before, the use of firm and year fixed effects models does not present viable estimations because they lead to a great loss of observations and exhibit poor fitting to the data. Moreover, the first stage of an IV estimation does not include year dummies. The reason is that the instrumental variable (Quota) already captures most of the time variation of the presence of female in the board; its effect would end up being absorbed in the estimation process if year dummies are included.

Focusing on the analysis, in column (1), the regression gives some interesting outcomes. One percentage point increase in Female increases the likelihood of the CEO's compensation to be linked to shareholders' return by 0.27 percentage points. Moreover, one percentage point increase in the fraction of independent directors increases that likelihood by 0.1 percentage points. These results support the common belief that these directors increase the use of this mechanism to transmit proper incentives to the CEO's performance. In column (3) I specify the model to adapt to the possibility of endogeneity, performing an IV estimation. Here, the variable Female maintains its magnitude but loses its significance, suggesting that there is no relation towards the incorporation of this compensation in the CEO's remuneration. This result is consistent with the findings of Adams and Ferreira (2009), who argue that women have a lower probability to sit in the remuneration committees and, therefore, have a minimal impact on the CEO's compensation. However, in column (4), I incorporate the squared coefficient of Female, Female2, to assess any possibility of a non-linear relation. The variable Female2 has a positive and statistically significant value suggesting that the relation is U-shaped. So, the argument of Adams and Ferreira (2009) holds when the presence of women on board is small. However, when the percentage of women exceeds the value of 29.4%⁵², they start to have a positive impact on incorporating a CEO's compensation linked to the shareholders' return. Thus, this evidence suggests that only when women hold a sizable portion of the board, they start to be heard and the ideas stop being blocked by the other directors. The conclusions withdrawn from the results highlight the efforts of female directors to align the interests more effectively between the managers and the shareholders.

⁵² According to the calculations hand-made based on the coefficients estimated on column (5).

D. Impact on Directors' Compensation Structure

The aforementioned mechanism to align CEO's interests can be extended to the directors of the board. They also have incentives to deviate from the shareholders' goals if they receive favours from the CEO. Therefore, it is important to give incentives to the directors, so that they continue to excel the role of monitoring the manager. The presence of a variable compensation can provide these effects effectively, being also a matter that can be influenced by the presence of more women.

Table 7 displays the probit estimates performed to address the fourth hypothesis of my dissertation: the impact of gender diversity on the director's compensation structure. BoardPayMethod is a dummy that equals 1 when the directors' compensation is linked with long-term objectives or stock options. Here, again, there may be some endogeneity issues. Women may have higher incentives to join a specific firm rather than another, because of its compensations plans. Therefore, the analysis presented in this subsection is the same as in the previous one. In columns (1) and (3), the variable of interest is Female, to assess the impact of diverse levels of gender diversity on the directors' compensation structure. In column (2), it is presented the 1st Stage of the IV regression, with the dependent variable being Female and the instrumental Quota. There are no multicollinearity issues among the variables used for this regression, see Table 16 Appendix C. The Hausman and Breusch-Pagan tests indicate the need to include fixed effects and use White-robust standard errors in the regressions below. For more detail, consult Appendix D.

Table 7 – The impact of gender diversity on the directors' compensation structure

The Table shows the marginal effects of the regressions performed to address the fourth hypothesis of my dissertation: the impact of gender diversity on the directors' compensation structure. The sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. The dependent variable (BoardPayMethod) is a dummy variable that equals one when the compensation structure of the directors' compensation is linked with long-term objectives or stock options. Female accounts for the percentage of female directors composing the board. All variables are defined in Appendix A. Column (1), (2) and (3) report the regressions specified for Nation and Industry, 2-digit sic code, fixed effects. All columns, except column (2), include year dummies. Column (2) reports the first stage of instrumental variable (IV) regression with Quota as an instrument for Female. Quota is a dummy variable that equals one when there is a legislation requiring a minimum percentage of female directors that affects the company. Column (3) reports the results of the IV estimation. The constant is omitted in column (2) to standardize with the other regressions. All dollar-denominated variables are adjusted to reflect 2016 prices. In parenthesis, it is presented the White-robust t-statistics or z-statistics. All variables (except the ones accounted as score or dummy) are winsorized at 1% and 99% levels. The symbols ***, **, * report statistical significance at 1%, 5% and 10% levels, respectively. ^ indicates that the coefficients were multiplied by 10000.

	(1) BoardPayMethod	(2) Female	(3) BoardPayMethod
Female	0.0521 ^{^***} (2.13)		0.0001 ^{***} (12.97)
BoardSize	0.189 ^{^*} (1.82)	0.3106 ^{***} (4.33)	-0.0776 [^] (-1.64)
IndependentDir	0.0343 ^{^***} (2.18)	0.0301 ^{***} (3.74)	-0.0003 [^] (-0.04)
LogSales	0.0001 ^{**} (2.42)	0.5036 ^{***} (3.25)	-0.128 [^] (-0.74)
MBV	0.105 [^] (0.75)	0.2652 ^{***} (4.35)	-0.0554 [^] (-0.59)
ROA	-0.405 [^] (-0.16)	-11.0902 ^{***} (-5.86)	0.0006 ^{***} (3.63)
Volatility	0.0002 (1.43)	-5.4707 ^{***} (-8.82)	0.0006 ^{***} (6.50)
Quota		15.8689 ^{***} (27.86)	
Observations	2360	4383	2360
Pseudo-R ²	0.533		0.543
R ²		0.409	
Adjusted R ²		0.398	
Nation & Industry Fixed Effects	Yes	Yes	Yes
Firm Fixed Effects	No	No	No
Year Dummies	Yes	No	Yes
Regression Type	Fixed Effects	1st Stage IV with Fixed Effects	IV with Fixed Effects

Once again, in these regressions, the structure of fixed effects chosen relies on the justifications given in the previous subsections.

In column (1), the coefficients for the variables *Female* and *IndependentDir* suggest a positive and statistically significant relations with the presence of this type of compensation. Even though these coefficients have a very small value, the relation is significant at 5% level. Correcting for the possibility of endogeneity, I have column (4). Here, *Female* is still positive and significant, suggesting that the effect of women on this type of compensation is not driven by endogeneity issues. Regarding, one percentage point increase in the fraction of female directors on board increases the likelihood of the directors' compensation to be linked to long-term objectives or stock options by 0.01 percentage points. Thus, there is evidence that the proportion of female directors is related to a board more aligned with the shareholders' goals, by a compensation mechanism. It also supports Adams and Ferreira (2009), who argue that women are more prone to sit on corporate governance and nomination committees that are responsible by setting the directors' compensation and therefore input more effectively this feature on directors' contracts.

5.2 Impact on Firm Value: Analysis of Results

The results presented in the previous subsections (A-D) advocate that a higher percentage of female directors is associated with better corporate governance performance by demonstrating a superior attendance at the meetings and by positively aligning the interests of directors with the ones of the shareholders and by increasing the likelihood of CEO Turnover after poor performance. Here, I will focus on the main purpose of this dissertation: the impact on firm value, relating to the previous evidence of a superior level of governance. My results so far suggest that women are not mere tokens and it will be interesting to understand how they impact the firm.

According to Hermalin and Weisbach (2001), boards are believed to be an essential factor to overcome agency problems. This supports that a more effective and strong governance will lead to an increase in firm value. On the other hand, too much board monitoring can harm firm value (Almazan & Suarez, 2003). Adams and Ferreira (2007) even argue that a wider level of interference by directors in the decision-making process can harm the communication channels between manager and directors, decreasing firm value.

Table 8 displays the estimates performed to address the fifth hypothesis of my dissertation: the impact of gender diversity on firm value. The dependent variable, *LnTobin*, is my measure of firm value and is

computed as the natural logarithm of Tobin's Q. I use with the logarithm rather than its usual form to follow the standard practice of my reference paper (Adams & Ferreira, 2009)⁵³. Accordingly, and following the approach of Adams and Ferreira (2009), I run all my research addressing the impact of the logarithmic form. In columns (1) and (2) the variable of interest is Female, to assess the impact of diverse levels of gender diversity on firm value.

A major concern in here is endogeneity, the potential of firms hiring women and/or women joining companies based on its performance. Therefore, I searched for an instrumental variable that needs to be correlated with the percentage of women in the board, but uncorrelated with the firm performance (unless if through the percentage of women in the board). In Europe, the main driver for the latest years increase in gender diversity on the board of directors has been the legislation that requires a minimum presence of female directors. If a legislation of this type is passed, then companies will be more open to hiring women and women will have higher incentives to apply for companies since they need them to comply with the norms. To calibrate this variable, I collected data for all the countries in my sample, whether they had a legislation of this kind or not and if they did the year the government passed it. Therefore, Quota is a dummy variable that equals one when a legislation requiring a minimum percentage of women on board is approved and starts to impact the company, and zero before that. By analysing Table 20 in Appendix E, it can be clearly understood that this legislation has affected a significant share of my sample, 24.23%, and has increased from 2005 to 2016 by 302.14% in affected companies by year. However, to be considered a good instrument, it had to meet some requirements: be significant to explain the endogenous variable (Female) and insignificant when studying the residuals of the first and second stage of the IV model. As shown in Appendix D, this variable meets all the requirements to assure its quality as an instrumental variable. So, in column (3), it is presented the 1st Stage of the IV regression, with the variable of interest being Female and the instrument Quota. There are no multicollinearity issues among the variables used for this regression, see Table 17 Appendix C. The Hausman and Breusch-Pagan tests indicate the need to include fixed effects and use White-robust standard errors in the regressions below. For more detail, consult Appendix D.

Table 8 – The impact of gender diversity on firm value

The Table presents the outcomes of the regressions performed to address the fifth hypothesis of my dissertation: the impact of gender diversity on firm value. The sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five

⁵³ Nonetheless, I still performed some regressions with the usual form of Tobin's Q. The results were qualitatively similar to the outcomes of the logarithmic form, only with slightly less significance.

firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. The dependent variable (LnTobin) is calculated as the Market value of the company (Book value of Assets – Book value of Equity + Market value of Equity) divided by the Book value of the company (Book value of Assets). Female accounts for the percentage of female directors composing the board. All variables are defined in Appendix A. Columns (1), (3) and (4) report the regressions specified for Nation and Industry, 2-digit sic code, fixed effects. Column (2) is performed using firm fixed effects. All columns, except column (3), include year dummies. Column (3) reports the first stage of instrumental variable (IV) regression with Quota as an instrument for Female. Quota is a dummy variable that equals one when there is a legislation requiring a minimum percentage of female directors that affects the company. Column (4) reports the results of the IV estimation. All dollar-denominated variables are adjusted to reflect 2016 prices. In parenthesis, it is presented the White-robust t-statistics. All variables (except the ones accounted as score or dummy) are winsorized at 1% and 99% levels. The symbols ***, **, * report statistical significance at 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	LnTobin		Female	LnTobin
Female	0.0018*** (3.96)	0.0012*** (2.79)		-0.0027*** (-2.64)
BoardSize	0.0008 (0.40)	0.0072*** (2.72)	0.3103*** (4.35)	0.0027 (1.42)
IndependentDir	0.0003 (1.09)	0.0001 (0.65)	0.0308*** (3.84)	0.0004* (1.76)
LogSales	-0.0709*** (-13.34)	0.0240 (1.12)	0.4817*** (3.13)	-0.0689*** (-12.91)
ROA	2.2778*** (25.54)	1.0557*** (11.51)	-8.5049*** (-4.66)	2.2639*** (25.26)
Volatility	-0.2496*** (-11.32)	-0.2154*** (-9.33)	-5.8081*** (-9.41)	-0.2677*** (-11.82)
Quota			15.8492*** (27.78)	
Constant	0.8215*** (7.49)	0.1677 (0.96)	2.5812 (0.65)	0.7880*** (7.11)
Observations	4383	4383	4383	4383
R ²	0.602	0.842	0.406	0.601
Adjusted R ²	0.594	0.822	0.396	0.594
Nation & Industry Fixed Effects	Yes	No	Yes	Yes
Firm Fixed Effects	No	Yes	No	No
Year Dummies	Yes	Yes	No	Yes
Regression Type	Fixed Effects	Fixed Effects	1st Stage IV with Fixed Effects	IV with Fixed Effects

In this section, since there are no problems with the loss of observations, a model with firm and year fixed effects is specified. However, I keep the same structure of Nation and Industry fixed effects in the first-stage regressions throughout the entire process of IV estimation. This happens because the results

presented with this structure are robust and similar to the ones that would be presented with firm and year fixed effects. Regarding, I assure a standardization of my tables and the consistency of my results all over this dissertation.

The results in column (1) support the hypothesis that gender diversity has a positive relation with firm value, defended by some literature, with a 1% significance level. To adapt these outcomes to the presence of firm-specific characteristics, in column (2) I re-estimate the model encompassing firm fixed effects. The positive and significant value of Female holds itself when firm fixed effects are added, suggesting that one percentage point increase in the fraction of female directors in the board increases the dependent variable by 0.12%. This suggests that the relation between gender diversity and firm value is not majorly affected by omitted features of the company. However, due to the possibility of endogeneity, I ran in column (4) an IV estimation. Now, Female has a negative and statistically significant value. Here, one percentage point increase in Female decreases the dependent variable by 0.27%. So, there is evidence that when controlled for the effect of the imposition of Quota, explaining the increase in Female through mandatory legislation, firms with higher percentage of female directors have lower Tobin's Q ⁵⁴. I can conclude that, besides robust to the presence of firm fixed effects, the positive relation stated in the literature does not hold when applying an IV estimation, reversing to a negative relation⁵⁵.

The previous conclusion, allied with the results produced in the previous subsections, suggest that more diverse board increase corporate governance ending up harming the firm financially. It is, however, hard to believe that this increase in governance would always harm the firm, as firms evidence distinct levels of it. Firms with an elevated level of governance can start over monitoring, harming the company, but firms that are poorly governed should benefit from the presence of female directors. To study this hypothesis, I tried to find a governance index similar to the one developed by Gompers, Ishii and Metrick (2003)⁵⁶ since their index is not available for European countries. GIndex, therefore, is a variable representing the level of the overall corporate governance in the company, being provided by the Asset4 database. In my sample, the average of this indicator is 67.24, with a minimum of 2.73 and a maximum of 97.69. In Table 9, I replicate the analysis performed previously only adding the GIndex and

⁵⁴ On this regard, I found no evidence of a non-linear relation that could lead to another interpretation of the outcomes in column (4).

⁵⁵ These conclusions support the study of Adams and Ferreira (2009) and Boehren and Stroem (2007), for US and Norway, respectively.

⁵⁶ Their index encompasses 24 indicators, each one measuring a specific characteristic that makes the company more difficult to be taken over (Gompers et al., 2003). Their Index is, therefore, different than the one that I obtained. A higher value of Gompers' Index means that the company is poorly governed whereas on the Governance Index that I obtained a higher value means that the company is well governed.

IndexFemale, the product of GIndex and Female that reveals the impact of gender diversity of firms with distinct corporate governance levels. There are no multicollinearity issues among the variables used for this regression, see Table 13 Appendix C. The Hausman and Breusch-Pagan tests indicate the need to include fixed effects and use White-robust standard errors in the regressions below. For more detail, consult Appendix D.

Table 9 – The impact of gender diversity on firm value, with Governance Index

The Table presents the outcomes of the regressions performed to address the fifth hypothesis of my dissertation: the impact of gender diversity on firm value, with various levels of Governance. The sample that consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. The dependent variable (LnTobin) is the logarithmic formula of the Market value of the company (Book value of Assets – Book value of Equity + Market value of Equity) divided by the Book value of the company (Book value of Assets). Female accounts for the percentage of female directors composing the board. GIndex is a governance index provided by the Asset4 database. This index represents the overall level of governance efficiency on the company. IndexFemale represents the product of the coefficients of Female and GIndex. All variables are defined in Appendix A. Column (1), (2), (4) and (5) are performed using Nation and Industry, 2-digit sic code, fixed effects. Column (3) is estimated using Firm fixed Effects. All columns, except column (4), include year dummies. Column (4) reports the first stage of instrumental variable (IV) regression with Quota as an instrument for Female. Quota is a dummy variable that equals one when there is a legislation requiring a minimum percentage of female directors that affects the company. Column (5) reports the results of the IV estimation. All dollar-denominated variables are adjusted to reflect 2016 prices. In parenthesis, it is presented the White-robust t-statistics. All variables (except the ones accounted as score or dummy) are winsorized at 1% and 99% levels. The symbols ***, **, * report statistical significance at 1%, 5% and 10% levels, respectively. ^ indicates that the coefficients were multiplied by 10000.

	(1)	(2)	(3)	(4)	(5)
		LnTobin		Female	LnTobin
Female	0.0017*** (3.79)	-0.0014 (-1.25)	-0.229^ (-0.02)		-0.0078*** (-4.01)
IndexFemale		0.489^*** (3.04)	0.169^ (1.25)		0.0001*** (3.13)
GIndex	0.0004 (1.45)	-0.0004 (-1.01)	0.0005 (1.41)	0.1169*** (12.93)	-0.0005 (-0.88)
BoardSize	0.0007 (0.40)	0.0009 (0.48)	0.0071*** (2.68)	0.3036*** (4.40)	0.0029 (1.50)
IndependentDir	0.0002 (0.78)	0.0001 (0.58)	0.044^ (0.02)	0.0101 (1.29)	0.0002 (1.01)
LogSales	-0.0726*** (-13.42)	-0.0727*** (-13.49)	0.0224 (1.05)	-0.0481 (-0.31)	-0.0727*** (-13.38)
ROA	2.2830*** (25.49)	2.2823*** (25.56)	1.0594*** (11.54)	-6.1027*** (-3.38)	2.2753*** (25.46)
Volatility	-0.2504*** (-11.36)	-0.2516*** (-11.41)	-0.2170*** (-9.43)	-5.9928*** (-9.97)	-0.2676*** (-11.79)
Quota				14.5940*** (25.49)	
Constant	0.8300*** (7.54)	0.8777*** (7.79)	0.1645 (0.96)	3.9997 (0.98)	0.8622*** (7.65)
Observations	4383	4383	4383	4383	4383
R ²	0.603	0.603	0.842	0.429	0.603
Adjusted R ²	0.595	0.595	0.822	0.42	0.595
Nation & Industry Fixed Effects	Yes	Yes	No	Yes	Yes
Firm Fixed Effects	No	No	Yes	No	No
Year Dummies	Yes	Yes	Yes	No	Yes
Regression Type	Fixed Effects	Fixed Effects	Fixed Effects	1st Stage IV with Fixed Effects	IV with Fixed Effects

As in the previous analysis, Table 8, column (1) of Table 9 supports the view that female directors impact positively firm value. However, when adding a new variable of interest (IndexFemale), columns (2) and (3), the coefficient of Female change its magnitude to the negative side, even though is not statistically significant. Moreover, IndexFemale gives a positive and statistically significant value, which is a surprising result. Before I enter into a deeper analysis, it is important to see how this variable behaves when controlled for the possible presence of endogeneity. Addressing this issue, column (5), Female again

shows a negative and significant coefficient, confirming the conclusions withdrawn from the previous analysis (one percentage point increase in Female decrease the Ln(Tobin's Q) by 0.78%). In addition, I found no evidence of any significant relation between the corporate governance level of the company, GIndex, and firm value. Still, the most important variable to focus on column (5) is IndexFemale⁵⁷. The variable holds the positive and statistically significant value presented in column (2). These results disagree with the study of Adams and Ferreira (2009)⁵⁸. My outcomes suggest that the presence of women in the board has a positive impact on firm value only in firms with good corporate governance. The overall average effect is, however, negative. These results, albeit surprising, suggest an interesting conclusion. In Europe the increase of women on board has been driven mainly by mandatory quotas. Therefore, in poorly governed companies, where the incumbent directors and managers are more entrenched (e.g., protected by anti-takeover amendments), women may suffer from some resistance in performing their work. In well governed firms, this is not so likely to happen, since there are fewer blocking forces and the board of directors tend to function more effectively, and so women are more heard and can more easily implement their contributions.

Summarizing, my results evidence that women are tougher monitors. Also, there is evidence suggesting that, when given proper "space" to contribute to the firm's corporate governance, women can increase the value of firms that are already well governed. It also shows the importance of addressing the issues of endogeneity, that if not adopted the results support the positive relation between female directors and firm value, while the true relation remains hidden. Results evidence that gender quotas serve primarily the purpose of gender equality and equality of opportunities, because, on average, women tend to decrease the value of the firm.

⁵⁷ The IV estimation was performed following the justifications above presented.

⁵⁸ Adams and Ferreira (2009) concluded that women, by increasing the corporate governance of the company, would create value in poorly governed firms and decrease value on companies that were already well governed, by revealing and over monitoring effect.

6. CONCLUSION

Gender diversity in the board of directors has been a central subject in corporate reforms worldwide. Still, there is little evidence on the consequences of such reforms. The present dissertation aims to study the impact of gender diversity on several measures of board's corporate governance effectiveness and on firm value. To do so, I use a sample of 4383 firm-year observations from 1091 European firms for the period of 2005 to 2016. Following the study of Adams and Ferreira (2009), I formulated four hypotheses for the impact on the corporate governance of the firm and one for the impact on firm value.

The previous literature argues about the differences in behaviour between male and female directors and the positive impact to the board's dynamics of the presence of women on board. However, their impact on corporate governance mechanisms is somehow unknown. Here, my results evidence that female directors tend to enhance the alignment of interests (through long-term objectives for directors and by linking the CEO's compensation to the shareholders' return⁵⁹), the level of attendance at the meetings (developing a more informed decision-making process) and the likelihood of CEO Turnover after poor performance (showing a more disciplinary role in dismissing CEOs that are not performing a good work). Therefore, the outcomes suggest that women demonstrate themselves as another input to enhance the firm's corporate governance.

My findings also reject the hypothesis of a positive relation between firm value and gender diversity, after addressing potential endogeneity issues. Although the positive relation holds for the presence of firm fixed effects, it does not hold when I use the IV specification, leading even to a statistically significant negative relation. Additionally, when controlled for distinct levels of corporate governance, there is compelling evidence that suggests that women add value in companies that are well governed and destroy value when the firms have a weak level of governance. This surprising effect is linked to the barriers they face when performing their duties in companies where the board of directors is not open to the mandatory entrance of female directors.

Furthermore, it is worth to mention that my results suffer from some limitations. In the analysis of the attendance levels, due to the lack of individual data, I cannot verify if the presence of female directors influences the male directors to change their behaviour. Also, I am not provided with any data about the

⁵⁹ Even though this effect is only seen in higher levels of female directors, there is enough evidence that suggest that when a certain fraction of gender diversity is attained the use of this compensation is encouraged by women.

portion of equity-based compensation or stock options in the payment received by the CEO and the directors of the board, respectively. The only information that I have is if that portion exists or not, not providing the information to study if more women increase the percentage of that variable compensation, aligning more efficiently the interests of both parties. Finally, there are many absences of data that diminish the number of observations from the earlier periods of my sample. Still, the results evidence some interesting relations that should be added to the existing literature.

I highlight that besides the results produced the importance is that women can be intrinsically different from men in their background and mindset. This will give women a real advantage over their male counterparts. Also, the intention of this research is to encourage firms to go beyond their comfort zone in order to find more suitable male and female directors for their boards. Even though it may produce some costs in the short-run, it can give substantial gains in the long-run.

It would be interesting for further research to focus on the limitations presented here. One possibility is the incorporation of individual data to study the influences of female directors on the male directors' behaviour. Additionally, the consequent increase of female presence in the board of directors has starting to reach the critical mass women on board. Therefore, in the incoming years, it would be interesting to see how the achievement of this level impacts the board and the financial performance of the company.

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8. APPENDIX

Appendix A – Variable Definition with respective Thomson Reuters *Eikon* code and Unit of Measure

Variable	Eikon Code	Definition	Unit Measure
Attendance	CGBFDP027	Level of aggregated attendance to the meetings by all directors.	% (Score)
BoardPayMethod	CGCPD01V	Is the compensation linked with long-term objectives or stock options?	Dummy (0/1)
BoardSize	CGBSDP060	Number of individuals constituting the board.	Number
CEOAge		Age of CEO.	Year
CEOChairman	CGBS009V	Is the individual both CEO and Chairman of the Board?	Dummy (0/1)
CEOPay	CGCPDP041	Is the CEO compensation linked to the shareholders' return?	Dummy (0/1)
CEORetire		Has occurred turnover due to retirement?	Dummy (0/1)
CEOTenure		Number of years holding the CEO's position.	Year
CEOTurnover		Has occurred replacement of CEO?	Dummy (0/1)
EBIT	WC18191	Earnings of the Company before Interest Expenses and Taxes.	\$/Thousand
Equity	WC03995	Book Value of Equity (Sum of Common Shareholders' Equity and Preferred Stock).	\$/Thousand
Female	CGBS017V	Percentage of total directors of the board that are Female.	% (Score)
Female Presence		Is there, at least, one female on the board of directors?	Dummy (0/1)
GIndex	CGVSCORE	Score Given to the Overall Corporate Governance Level of the Company.	% (Score)
IndependentDir	CGBS007V	Percentage of total directors that are classified, by the company, as Independent.	% (Score)
Industry	WC07021	4-Digit Industry Classification	Number
LnTobin		Log(TobinQ).	Decimal Number
LogSales		Log(Sales).	\$/Million
MBV (Market-to-Book Value)		$\frac{MVEquity}{Equity}$	Decimal Number

MVEquity	MV	Market Value of Equity (Price of the shares times number of Ordinary Shares).	\$/Thousand
Nation	WC06026	Nation of the Company.	Name
NrMeetings	CGBFDP024	Number of Meetings held by the Board of Directors in that Year.	Number
Quota		Is there a quota legislation affecting the company in that year?	Dummy (0/1)
ROA		$\frac{\text{EBIT}}{\text{TAssets}}$	Decimal Number
Sales	WC01001	Gross sales/revenues minus discounts, returns and allowances.	\$/Million
Sic2		2-Digit Industry Classification	Number
StockPerform		BHAR of the Stock, compared with the benchmark (Company's Annual Returns minus Benchmark's Annual Returns)	Decimal Number
TAssets	WC02999	Book Value of Assets (Sum of Current Assets, Receivables, Investment in Consolidated Subsidiaries, other Investments, Net Property Plant and Equipment and other Assets).	\$/Thousand
TobinQ		$\frac{\text{TAssets} - \text{Equity} + \text{MVEquity}}{\text{TAssets}}$	Decimal Number
Volatility		Historical Volatility of the Stock (Standard Deviation of Company's Monthly Returns * $\sqrt{\text{Trading Days}}$)	Decimal Number

Appendix B – Sample and Gender Diversity Distribution

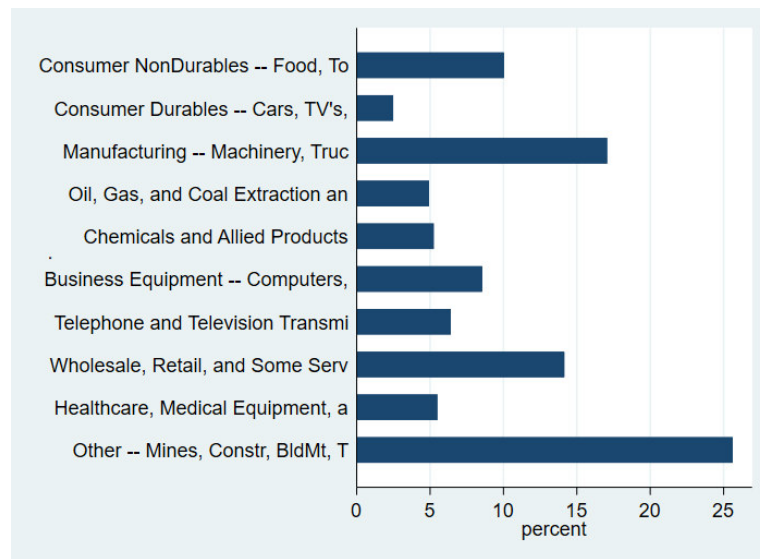


Figure 2 – Sample distribution by Industry.

This Figure presents the distribution by Industry on my sample that consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. The distinct categories were achieved by using the Fama and French 12 industry sic-code and by dropping the Financial and the Utilities sectors, that would bring complications to my results.

Table 10 – Sample Distribution by Nation.

This Table presents the distribution by Nation on my sample that consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus.

Nation	Firm-Year Observations	Percentage
United Kingdom	1,933	44.10%
France	711	16.22%
Sweden	284	6.48%
Germany	226	5.16%
Finland	225	5.13%
Switzerland	218	4.97%
Belgium	149	3.40%
Italy	145	3.31%
Ireland	140	3.19%
Netherlands	132	3.01%
Spain	68	1.55%
Norway	67	1.53%
Portugal	26	0.59%
Denmark	16	0.37%
Hungary	14	0.32%
Luxembourg	9	0.21%
Austria	8	0.18%
Greece	6	0.14%
Turkey	6	0.14%
Total	4,383	100.00%

Table 11 – Level of gender diversity and presence by Industry

This Table presents the level of gender diversity and presence by Industry. My sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. The industry categories were achieved through the Fama and French 12-Industry sic code. Female is the percentage of female directors on the board. FemalePresence is a dummy indicating if the firm has at least one women on board.

Industry	Female	FemalePresence
Consumer Nondurable	18.53%	82.95%
Consumer Durable	17.26%	86.24%
Manufacturing	15.70%	76.47%
Oil, Gas, and Coal	14.20%	71.30%
Chemicals	19.14%	82.17%
Business Equipment	14.46%	68.80%
Telephone and Television	18.79%	83.63%
Wholesale and Retail	17.91%	85.16%
Healthcare	16.36%	81.33%
Other	15.51%	74.44%

Table 12 – Level of gender diversity and presence by Nation

This Table presents the level of gender diversity and presence by Nation. My sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. Female is the percentage of female directors on the board. Here are presented the average level of gender diversity by the different nations.

Nation	Female
GREECE	77.30%
HUNGARY	42.40%
NORWAY	39.23%
SWEDEN	28.05%
FINLAND	22.90%
FRANCE	21.72%
DENMARK	21.49%
AUSTRIA	19.03%
NETHERLANDS	17.60%
LUXEMBOURG	17.32%
SPAIN	15.33%
BELGIUM	14.90%
GERMANY	14.10%
UNITED KINGDOM	13.11%
IRELAND	12.26%
ITALY	12.23%
SWITZERLAND	12.05%
PORTUGAL	7.98%
TURKEY	4.76%

Appendix C – Correlations between Variables

Table 13 – Correlation of the Variables present in Attendance regression

This Table presents the correlation among the dependent, independent and control variables presented in the Attendance regression. The sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. All variables are defined in Appendix A. All dollar-denominated variables are adjusted to reflect 2016 prices. All variables that were not defined as scores or dummies, are winsorized at 1% and 99% levels.

	Attendance	Female Presence	Female	NrMeetings	Board Size	Independent Directors	Log Sales	MBV	ROA	Volatility	Stock Perform
Attendance	1										
FemalePresence	0.078	1									
Female	0.0602	0.6839	1								
NrMeetings	0.0719	-0.0018	0.0329	1							
BoardSize	-0.2608	0.2352	0.1446	-0.1422	1						
IndependentDir	0.1581	0.0332	0.0698	0.1617	-0.2704	1					
LogSales	-0.1499	0.2156	0.1928	-0.0209	0.5136	0.0264	1				
MBV	0.0782	0.0417	0.0365	-0.0504	-0.0950	0.0078	-0.0919	1			
ROA	0.0455	-0.0324	-0.0213	-0.1146	-0.0959	0.0184	-0.0656	0.3976	1		
Volatility	0.0142	-0.1088	-0.1586	0.152	-0.1311	0.024	-0.2564	-0.2282	-0.2904	1	
StockPerform	0.0277	-0.0018	-0.0076	-0.0857	-0.0238	0.0215	0.009	-0.0130	0.2379	-0.1389	1

Table 14 - Correlation of the Variables present in CEO Turnover regression

This Table presents the correlation among the dependent, independent and control variables presented in the CEOTurnover regression. The sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. All variables are defined in Appendix A. All dollar-denominated variables are adjusted to reflect 2016 prices. All variables that were not defined as scores or dummies, are winsorized at 1% and 99% levels.

	CEO Turnover	Female	Stock Perform	CEOAge	CEO Chairman	CEO Tenure	Board Size	Independent Dir	Log Sales	Volatility
CEOTurnover	1									
Female	0.0059	1								
StockPerform	-0.1841	0.0031	1							
CEOAge	0.1824	0.0721	-0.0336	1						
CEOChairman	0.003	0.0585	-0.0221	0.123	1					
CEOTenure	0.0763	0.0135	0.0045	0.3628	0.1003	1				
BoardSize	0.014	0.1456	-0.0354	0.2599	0.2101	0.057	1			
Independent Dir	0.0065	0.0792	0.0198	-0.0591	-0.0878	-0.0407	-0.2877	1		
LogSales	0.035	0.1947	-0.0049	0.1612	0.1004	-0.0902	0.5125	0.0334	1	
Volatility	0.0254	-0.1244	-0.1462	-0.0899	-0.0525	-0.0403	-0.1298	0.0117	-0.2465	1

Table 15 - Correlation of the Variables present in CEO Compensation regression

This Table presents the correlation among the dependent, independent and control variables presented in the CEO Pay regression. My sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. All variables are defined in Appendix A. All dollar-denominated variables are adjusted to reflect 2016 prices. All variables that were not defined as scores or dummies, are winsorized at 1% and 99% levels.

	CEOPay	Female	CEOAge	CEO Chairman	CEO Tenure	Board Size	Independent Dir	Log Sales	MBV	ROA	Volatility
CEOPay	1										
Female	-0.0896	1									
CEOAge	-0.0825	0.0828	1								
CEOChairman	-0.1963	0.0622	0.1153	1							
CEOTenure	-0.1035	0.012	0.3646	0.0981	1						
BoardSize	-0.239	0.1446	0.2552	0.212	0.0563	1					
IndependentDir	0.1375	0.0698	-0.0633	-0.0761	-0.0399	-0.2704	1				
LogSales	-0.1138	0.1928	0.1596	0.1031	-0.0849	0.5136	0.0264	1			
MBV	0.0693	0.0365	-0.0676	-0.0274	-0.0028	-0.0950	0.0078	-0.0919	1		
ROA	0.0032	-0.0213	-0.1032	-0.0246	0.0288	-0.0959	0.0184	-0.0656	0.3976	1	
Volatility	-0.0224	-0.1586	-0.0935	-0.0561	-0.0434	-0.1311	0.024	-0.2564	-0.2904	-0.2904	1

Table 16 - Correlation of the Variables present in Board Compensation regression

This Table presents the correlation among the dependent, independent and control variables presented in the BoardPayMethod regression. My sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. All variables are defined in Appendix A. All dollar-denominated variables are adjusted to reflect 2016 prices. All variables that were not defined as scores or dummies, are winsorized at 1% and 99% levels

	BoardPay Method	Female	Board Size	Independent Dir	LogSales	MBV	ROA	Volatility
BoardPayMethod	1							
Female	0.0457	1						
BoardSize	0.0102	0.1446	1					
IndependentDir	-0.0148	0.0698	-0.2704	1				
LogSales	-0.0156	0.1928	0.5136	0.0264	1			
MBV	0.0274	0.0365	-0.0950	0.0078	-0.0919	1		
ROA	-0.0064	-0.0213	-0.0959	0.0184	-0.0656	0.3976	1	
Volatility	0.0549	-0.1586	-0.1311	0.024	-0.2564	-0.2282	-0.2904	1

Table 17 - Correlation of the Variables present in Firm Value regression

This Table presents the correlation among the dependent, independent and control variables presented in the Firm Value regression. My sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. All variables are defined in Appendix A. All dollar-denominated variables are adjusted to reflect 2016 prices. All variables that were not defined as scores or dummies, are winsorized at 1% and 99% levels.

	TobinQ	Female	BoardSize	IndependentDir	LogSales	ROA	Volatility	GIndex
TobinQ	1							
Female	0.0478	1						
BoardSize	-0.1575	0.1446	1					
IndependentDir	-0.0198	0.0698	-0.2704	1				
LogSales	-0.2428	0.1928	0.5136	0.0264	1			
ROA	0.6237	-0.0213	-0.0959	0.0184	-0.0656	1		
Volatility	-0.2512	-0.1586	-0.1311	0.024	-0.2564	-0.2904	1	
GIndex	-0.0479	0.1098	-0.1334	0.3198	0.0748	-0.0572	-0.0304	1

Appendix D – Outcomes of Tests

Table 18 – Summary of the Outcome of Tests performed

This Table presents the summary of the tests performed, due to the methodology concerns. My sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. To use Fixed Effects Models, I performed the Hausman test. To detect the presence of heteroskedasticity, I performed the Breusch-Pagan test. Finally, to assess the quality of the instrument used, Quota, I assessed 2 criteria: significance when specifying the endogenous variable and insignificant correlated to the residuals of the first and second stages of the IV estimation. The statistic for each test and the significance levels can be consulted in the respective column.

	Fixed Effects (Hausman)	Quality of Instrument	Heteroskedasticity (Breusch-Pagan)
Attendance	Chi2= 102.78 p-value= 0.00		Chi2= 994.08 p-value= 0.00
CEOTurnover	Chi2= 239.37 p-value= 0.00		Chi2= 872.52 p-value= 0.00
CEOPay	Chi2= 522.41 p-value= 0.00	IV 1st Stage = Significant (p-value= 0.00) Residuals IV 1st Stage = Insignificant (p-value= 1) Residuals IV 2nd Stage = Insignificant (p-value= 0.96)	Chi2= 21.28 p-value= 0.00
BoardPay Method	Chi2= 31.50 p-value= 0.00	IV 1st Stage = Significant (p-value= 0.00) Residuals IV 1st Stage = Insignificant (p-value= 1) Residuals IV 2nd Stage = Insignificant (p-value= 0.8)	Chi2= 1761.13 p-value= 0.00
LnTobin	Chi2= 474.46 p-value= 0.00	IV 1st Stage = Significant (p-value= 0.00) Residuals IV 1st Stage = Insignificant (p-value= 1) Residuals IV 2nd Stage = Insignificant (p-value= 1)	Chi2= 846.56 p-value= 0.00
LnTobin with GIndex	Chi2= 702.68 p-value= 0.00	IV 1st Stage = Significant (p-value= 0.00) Residuals IV 1st Stage = Insignificant (p-value= 1) Residuals IV 2nd Stage = Insignificant (p-value= 1)	Chi2= 1655.5 p-value= 0.00

Appendix E – Company Overview by Quota and Critical Mass

Table 19 – Percentage of companies with Critical Mass

This Table presents the level of critical mass throughout my sample, and its evolution by year. My sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. Critical Mass is achieved when a company has at least three women on board.

Year	Companies Present on Sample	Companies with Critical Mass	Percentage of Companies with Critical Mass
2005	173	8	4.62%
2006	180	9	5.00%
2007	250	21	8.40%
2008	301	25	8.31%
2009	370	39	10.54%
2010	430	82	19.07%
2011	450	106	23.56%
2012	463	132	28.51%
2013	460	145	31.52%
2014	457	183	40.04%
2015	443	196	44.24%
2016	406	201	49.51%

Table 20 – Percentage of companies affected by Quota

This Table presents the percentage of companies affected by quota's legislation and its evolution by year. My sample consists of an unbalanced panel data of 4383 firm-year observations from 1901 European firms, from 2005 to 2016, that were both present in WorldScope and Asset4 databases and had a minimum of five firm-year observations. Firm-level financial data (as well as nation and industry) are from Thomson Reuters Datastream/ Worldscope. Board-level data are from Thomson Reuters Asset4 database. CEO characteristics and turnover are hand-collected from Amadeus. Quota is a dummy variable that equals one when there is a legislation requiring a minimum percentage of female directors that affects the company.

Year	Companies present on sample	Companies affected by Quota	Percentage of Companies Affected by Quota
2005	173	16	9.25%
2006	180	15	8.33%
2007	250	20	8.00%
2008	301	23	7.64%
2009	370	29	7.84%
2010	430	37	8.60%
2011	450	139	30.89%
2012	463	145	31.32%
2013	460	156	33.91%
2014	457	158	34.57%
2015	443	173	39.05%
2016	406	151	37.19%