Are Women the Superheroes of the Corporate World?

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Abstract

Are women the superheroes of the corporate world? The increasing number of women directors coupled with the various policies and quotas in favor of boards' gender diversity have given rise to extensive research on women directorship. This study investigates the impact of boards' gender diversity on firm performance and firm risk. Relying on 136 FTSE100 companies and 11 years of data, this study finds evidence that gender diversity enhances corporate outcomes. Gender diversity within the executive directors' team is associated with an increase in corporate performance and a decrease in corporate risk. However, no impact had been identified regarding gender diversity within the non-executive board of directors. The results convey the benefits of women participation in the executive suite and demonstrate the positive impact of boards' gender diversity on corporate outcomes. As such, this study highlights women leadership potential that is being hindered by gender stereotypes.

"If Lehman Brothers had been Lehman Sisters, today's economic crisis clearly would look quite different." — Christine Lagarde, Managing Director of the International Monetary Fund.

"We need women at all levels, including the top, to change the dynamic, reshape the conversation, to make sure women's voices are heard and heeded, not overlooked and ignored." — Sheryl Sandberg, Chief Operating Officer of Facebook Corporation.

Título da Dissertação: As mulheres serão os superherois do mundo corporativo?

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Resumo

As mulheres serão os superherois do mundo corporativo? O numero crescente de mulheres em cargos diretivos, e o aumento de politicas e cotas a favor da diversificação do genero no board of directors tem levado ao aumento de estudos sobre a liderança das mulheres. Este estudo investiga o impacto que a diversidade do genero tem na performance da empresa como no risco da mesma. Tendo por base 136 FTSE 100 empresas e 11 anos de dados, este estudo encontra evidencia de que a diversidade do genero melhore os resultados da empresa. A diversidade de genero dentro de directores executivos está associada com um aumento da performance da empresa e uma diminuição no risco da mesma. Contudo nenhum impacto tem sido notado em cargos não executivos. Os resultados demonstram os beneficios da participação de mulheres em cargos executivos e demonstra o impacto positivo que a inserção de mulheres tem no board of directors. Desta forma este estudo evidencia o potencial da liderança de mulheres e por outro lado o esterótipo de generos que afecta esta área.

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Table of Contents

Index of Tables

I. Introduction

In a male dominated corporate hierarchy, women's access to top management positions is slowly progressing. Despite this progress, while women make up nearly half the global population, they only represent 20% of global senior leadership positions (Grant Thornton, 2015). Gender diversity on boards is recurrently at the center of the academia, press and political agendas. At the wake of corporate scandals and economic crises, governments are increasingly seeking a gender balance. Thus, a number of countries have instituted quota-legislations in an effort to increase women's presence on the boards of directors. In 2003, Norway was the first country to establish a quota of 40% with a strict sanction: dissolve and fine companies until compliance. Nine other countries subsequently instituted legally binding quotas ranging from 33% to 50%. These countries include Spain, Québec (Canada), and France. Other countries adopted less drastic policies through instituting non-legally binding quotas in their corporate governance codes (Terjesen et al., 2015). In total, 32 countries have encouraged women representation on boards through policies ranging from disclosure requirements, to legally binding quotas between 2008 and 2015 (Adams, 2016). These political actions are not only for the sake of gender equality, but also for the good of the corporations.

Are women the Superheroes of the corporate world? The male dominance in the boards of the financial sector known as the "old boy's networks" gave rise to an interesting hypothesis that is being debated: "The Lehman Sisters Hypothesis" (Adams and Ragunathan, 2015; van Staveren, 2014). The underlying assumption of the "The Lehman Sisters Hypothesis" debate is that if more women would have been on boards, the Lehman Brothers scandal could have been avoided. Van Staveren (2014) reports that this view is shared and explicitly expressed by many policy makers and politicians including Neelie Kroes and Viviane Reding (EU commissioners), Christine Lagarde (Managing director of the IMF) and, Harriet Harman (former UK Minister). As a result, researchers have been extensively investigating the impact of women leadership on corporations. Work on gender-diversity falls under two broad aspects: corporate performance and corporate risk taking. Both literature streams did not reach a consensus to date.

In some studies, female executive and non-executive board members are found to have a positive impact on firms' performance. Some suggest that female CEOs are associated to higher ROAs (Peni, 2014; Krishnan and Park, 2005). Other authors associate the proportion of female executive directors with corporate value creation (Davis et al., 2010; Smith et al. 2006). Higher percentages of non-executive board members are also found to enhance corporate

performance (Erhardt et al., 2003; Carter et al., 2010). However, contradicting findings also arise in the literature associating women CEOs and executive directors to negative corporate outcomes (Darmadi, 2013; Lee and James 2007). Other authors stress the negative impact of gender quotas in Norway (Bøhren and Strøm, 2010; Ahern and Dittmar, 2012). The literature also includes studies that report insignificant results between women directors and firms' performance (Randøy et al., 2006; Francoeur et al., 2008).

Research on boards' gender-diversity impact on corporate risk taking is also characterized by contrasting findings. Women are perceived as risk averse compared to their male counterparts in non-managerial contexts; however, it is unclear whether this proclaimed and generally accepted gender stereotype applies to the managerial population (Hudgens and Fatkin, 1985; Johnson and Powell, 1994; Croson and Gneezy; 2009). Some studies report that female CEOs are more conservative towards debts and acquisitions (Frank and Goyal, 2007; Huang and Kisgen, 2013). Women executive directors adopt a prudent approach when facing risky decisions which results in shareholders' value creation (Levi et al., 2014; Perryman et al., 2016). Regarding non-executive directors, women are perceived as tougher monitors who would scrutinize risky and fraudulent activity (Adams and Ferreira, 2009). Their proportion as non-executive directors is characterized by a decrease in corporate risk and variability of firms' returns (Levi et al., 2014; Hutchison et al., 2015).

In fact, female directors are rarely associated to an increase in corporate leverage. Instances in the literature are skewed toward the finance industry, where women are found to be less risk averse than women in other sectors (Sapienza et al., 2009). In a study limited to the banking sector, women executives are found to increase portfolio risk (Berger et al., 2014). Other authors do not document differences among male and female directors relative to risk aversion. Empirical studies and surveys report that the risk aversion of women directors is comparable to that of their male counterparts (Maxfield et al., 2010; Atkinson et al., 2003). A study on the impact of Norway's gender quota finds no change in firms' leverage upon the implementation of the 40% female representation on boards (Matsa and Miller, 2013). The Lehman Sisters hypothesis was rejected upon studying US banks risk taking around the financial crisis time period (Adams and Ragunathan, 2015).

Motivated by the contradicting findings in the literature relative to women directors' impact on corporate outcomes, this thesis studies the impact of women executive and non-executive directors on the risk and performance of firms. The impact of female leadership on

corporate outcomes is continuously scrutinized and judged making it even more challenging for the latter to climb senior management positions. Therefore, in line with Perryman et al. (2016) among others, this thesis considers women's impact on corporate outcomes in aggregate terms as part of the top management teams. As opposed to focusing on gender-based differences, the impact of boards' gender diversity is studied as a synergy. Given women's underrepresentation on boards, most of the studies do not disaggregate executives from the board of directors in empirical studies (McCann and wheeler, 2011). However, this thesis distinguishes between these corporate subpopulations that are characterized by different duties and roles. Using a sample of FTSE100 corporations, this thesis reports a significant positive link between female executives and performance, and a significant negative link between female executives and corporate risk. However, no significant impact is documented when it comes to the impact of female non-executive directors.

The next section provides a review of the main findings in the literature. Section III presents the data and methodology used in this study. Section IV details the results of the empirical study in two distinct subsections: Female Directors & Corporate Performance and Female Directors & Corporate Risk. Section V provides a brief discussion of the results followed by section VI which outlines the limitations and suggests further research areas. Section VII concludes the study.

II. Literature Review

1. Women in Leadership

Corporate leadership positions have been traditionally and historically held by men. The glass ceiling is a metaphor commonly used to describe invisible barriers preventing women to access leadership positions. Taste-based discrimination and child-related decisions are instances of these barriers (Adams and Kirchmaier, 2013). Even when they manage to attain top senior positions, women still face many barriers ranging from unequal pay to lack of peer mentoring as opposed to their male counterparts (Matsa and Miller, 2013; Perryman et al., 2016). Nevertheless, women have made a tremendous progress breaking through this glass and are increasingly accessing executive and non-executive positions. To anticipate the potential impact of gender diversity on corporate boards, many scholars attempt to identify the characteristics of female managers.

The unique set of skills that characterizes women is a common argument in favor of gender diversity on boards. Some scholars report that women would bring different

perspectives originating from their different experiences, values and thinking (Adams and Ferreira, 2009; Post and Byron, 2014). Other studies document that female attributes and interpersonal skills are preferred for leadership positions during times of crisis (Haslam et al, 2010). Women board-members are found to exhibit better attendance rates and higher involvement in the monitoring process compared their male counterparts (Adams and Ferreira, 2009). Women managers are found to have different strategic approaches than men managers. Female managers are described as more interactive and process-oriented as opposed to men who are more transactional and outcome-oriented (Johansen, 2007).

When it comes to the impact of gender diversity on corporate risk, women are widely documented to be more risk averse than their male counterparts in psychological and experimental research (Barber and Odean, 2011; Byrnes et al., 1999). Barber and Odean (2011) attribute women risk aversion to the fact that they are less overconfident than their male counterpart. However, Deaves et al. (2008) finds no differences between male and female traders, and no evidence of a higher male overconfidence. It is unclear whether the risk aversion stereotype applies to the managerial population (Croson and Gneezy, 2009). Women in Swedish corporate boards are reported to be more risk loving (Adams and Funk, 2012). Women in the financial industry are found to be less risk averse than women in other industries (Sapienza et al., 2009). Nelson (2016) performs a meta-analysis of 37 published studies. After pooling the data and performing robustness checks, the author concludes that there is no evidence for large differences among men and women in risk aversion. In fact, Nelson (2016) finds evidence of a confirmation bias. This bias constitutes the tendency to seek results that confirm prior expectations. Maxfield et al. (2010) assert that the generally accepted stereotype of women risk aversion, limits the benefits their added value as managers. The stereotypes and generalizations about women directors are dangerous as they would most likely influence the recruitment process of female candidates.

Not all women are the same; “female leadership traits” are not universal. Assessing the impact of gender diversity based on the observed trends in women management style and feminine characteristics might be misleading. Therefore, this thesis investigates the impact of diversity in aggregate terms in line with Perryman et al. (2016). Findings from empirical studies investigating the impact of gender diversity on corporate outcomes are summarized in the next sections.

2. Board diversity and Corporate Performance

Researchers have extensively investigated the link between the presence of women on boards and the financial performance of firms. This section summarizes some of the findings and presents opposing views on this topic.

Relying on a sample of S&P500 firms, Peni (2014) finds that firms led by female CEOs produce higher ROAs. Consistent with these findings, Krishnan and Park (2005) document a positive impact of women executives on corporate performance measured by the ROA. Smith et al. (2006) rely on a sample of 2500 Danish companies and report an average positive effect of executives on the corporate performance. Using a sample of small service businesses, Davis et al. (2010) find that female CEOs outperform their male counterparts. Huang and Kisgen (2013) also report that men underperformed women executives by 2% in terms of returns announcements following acquisitions.

Erhardt et al. (2003) and Carter et al. (2003) document a positive impact of the board diversity on companies' financial performance. Erhardt et al. (2003) use a sample of the 127 largest American companies from 1993 to 2002. They rely on ROA and Tobin's Q as performance measures and the percentage of women and minorities on boards as a gender indicator. Carter et al. (2003) use a larger sample of 638 Fortune 1000 firms and adopts Tobin's Q as a proxy for the firm value. Both studies reported the positive impact of boards' diversity on the financial performance.

Adler (2001) uses a sample of Fortune 500 companies over the time period between 1980 and 1998. The author confirms that the presence of women on the 20 highest positions in the company is associated to high profits. Liu et al. (2014) investigate the impact of boards' diversity in emerging markets. Using a sample of Chinese companies, they conclude that a higher percentage of women on boards is associated to a superior corporate performance.

Weber and Zulehner (2010) find consistent results when studying the impact of women directors in an especially dynamic corporate environment: Start ups. This study is motivated by the fact that start-ups are especially sensitive to managerial decision making. As startups are new entities, this study overcomes reverse causality issues in the sense that results are not biased by past performance.

Francoeur et al. (2008) use an innovative approach to measure firms' financial performance while controlling for risk: they rely on firms' betas, market-to-book ratios and

analysts' forecasts standard deviation. They report that gender diversity among the executive team results in positive and abnormal returns and higher ROE.

One of the most cited studies in this topic is the Catalyst (2004) that reports a strong positive link between gender diversity and financial performance using a sample of 352 Fortune 500 companies over a period extending from 1996 to 2000. This study measures performance using ROE and companies' stock returns. The report asserts that the presence of women on boards enhances firms' performance. The same organization follows up with another study in Catalyst (2007) and confirms its previous findings using a sample of 520 Fortune 500 companies including leavers and joiners and adding more financial indicators such as the ROIC. Schrader, Blackburn and Iles (1997) study a sample of 200 Fortune 500 companies and find a positive link between the percentage of women on boards and firms' performance.

Conversely, other researchers report a negative relationship between the percentage of women on boards and firms' financial performance. Ahern and Dittmar (2012) and Bøhren and Strøm (2010) report a negative impact of women representation on the corporate performance of Norwegian companies. Ahern and Dittmar (2012) study the impact of the 40% female director quota that was imposed in Norway. Their study demonstrates that the increase in women representation on boards has a negative impact on the corporate performance. They attribute these findings to the fact that the rush to recruit female directors might have resulted in the selection of inexperienced and inadequate female representation. Bøhren and Strøm (2010) also link female representation with a lower firm value creation. Put in context, their study focuses on Norwegian firms and stresses the shortcomings of the imposed quota of female presence on boards. Consistent with Ahern and Dittmar (2012), the authors find that Norway's quotas could be ineffective as this pressured recruitment process might result in an ineffective recruitment process. Although these studies are specific to Norway's quota conditions, they represent important findings in the literature, and question whether quotas are an effective way to increase gender diversity on boards.

In the corporate governance literature, Adams and Ferreira (2007) report that excessive monitoring has a negative impact on firm value. In Adams and Ferreira (2009) the authors found an average negative effect of boards' gender diversity on firms' performance and associate it to women directors over engaging in monitoring activities in well governed firms. Darmadi (2013) suggests that women executives are associated with a negative impact on

Indonesian firms.

Finally, numerous studies did not identify any link between gender diversity on boards and the performance of firms. Randøy et al. (2006) rely on a European sample of the largest 500 companies from Denmark, Norway and Sweden and demonstrate that female presence on boards does not have a significant effect on financial performance. Rose (2007) uses a sample of Danish companies over the period extending from 1998 to 2001 and reports insignificant results about this link as well. Carter et al. (2010) test the effect of both gender and racial diversity of board members. The financial performance is measured by Tobin's Q and ROA relying on a sample of the biggest S&P500 companies over a period of time extending from 1998 to 2002. They do not find a significant relationship between board diversity and corporate performance.

Most of the studies that investigate gender-diversity on boards do not disaggregate executives given the small proportion of women in the corporate directorship (McCann and Wheeler, 2011). When assessing women impact on corporate risk, this thesis distinguishes between three different functions: CEOs, executive and non-executive directors.

3. Board Diversity and Corporate Risk

A review of the literature provides mixed results when it comes to the impact of gender-diversity on corporate risk taking. However, a general insight from the literature is that women representation in the boardroom decreases corporate risk. Either this holds true or simply emanates from data mining and confirmation biases, it is certainly among the expected outcomes of quotas and regulations that are being implemented all over the world to urge for women representation on boards. This section explores the findings related to the impact of gender diversity among executives and independent board members on the corporate risk taking.

Most of the studies investigating the impact of CEOs' gender on firms' risk provide evidence of female CEOs risk aversion. Martin et al. (2009) conclude that the market perceives women CEOs as risk averse using an event study consisting of 70 announcements of women CEOs. Cole (2013) also reports that leverage is lower for female owned companies. Faccio et al. (2016) investigate the link between the presence of women on boards and the corporate risk of both public and private European companies. To measure risk they use three proxies: the first is leverage which they defined by the ratio of financial debt divided by the sum of

financial debt plus equity; the second is the volatility of ROA; the third is the likelihood of survival of the firm over a 5 years period. Their empirical results establish that firms run by female CEOs have a significantly lower risk. They also document a reduction in leverage associated with the transition from a male to a female CEO.

Consistent with this idea, Frank and Goyal (2007) find that firms are less likely to issue debt when the CEO is a female. The authors stress the importance of the impact of managers' fixed effects and their implications for a given firm. Huang and Kisgen (2013) examine the difference between female and male CEOs and CFOs. They find that women are more conservative when it comes to debt issuing and acquisitions.

Other studies investigate the impact of women representation on boards. Women directors are reputed to be tougher monitors and have better attendance rates than their male counterparts (Adams and Ferreira, 2009; Levi et al, 2014). Levi et al. (2014) study a sample of US companies listed in the S&P1500 index (including S&P500, S&P400 and S&P600 small and midcap firms) over the time period from 1997 to 2009. Analyzing mergers and acquisitions, they report that female directors are considerably more conservative than their male counterparts. The authors conclude that: "each additional female director is associated with 7.6% fewer bids, and each additional female director on a bidder board reduces the bid premium paid by 15.4%" (Levi et al., 2014).

Carter et al. (2015) find that women directors are more risk averse and conclude that this characteristic reduces firms' overall risk. Perryman et al. (2016) reach a similar conclusion using a sample of 2454 US firms. Hutchinson et al. (2015) study the impact of women directors on 500 Australian companies and report that board gender diversity reduces firms' risk. Lenard et al. (2014) find that women on boards decrease the variability of stock returns.

In general, women are reported to be more informed and prudent when facing risky decisions (Croson and Gneezy, 2009; Huang and Kisgen, 2013; Barber and Odean, 2001).Therefore, studies that find that female presence on boards increases firms' risk are less abundant in the literature. An instance is Adams and Funk (2012) who find that female Swedish directors are more risk loving compared to their male counterparts. Berger et al. (2014) report that bank portfolio risk increases with the increase of female executives on boards. Although their findings are only marginally significant, they attribute their results to the fact that female executives might be inexperienced compared to their male counterparts.

Another stream of literature reports no evidence of female impact on corporate risk. Gender based differences in risk aversion is the most prominent argument in favor of the inverse relationship between female directors and corporate risk. Croson and Gneezy (2009) suggest that it is misleading to generalize this fact to the corporate level. The authors provide a summary and analysis for 10 experimental studies concerning the difference in risk-aversion between women and men in non-managerial contexts. Upon performance of robustness checks of the 10 studies; they conclude that women are more risk averse than their male counterparts. However, they consider that managers are an "exception to the rule." Hudgens and Fatkin (1985), Johnson and Powell (1994) and, Bruce and Johnson (1994) provide further evidence of differences in risk propensities between the managerial and non-managerial population. These authors conclude that gender based differences in risk aversion do not necessarily apply to the corporate level.

Maxfield et al. (2010) analyze a survey database of 661 female managers and find no evidence of gender related differences between men and women in risky managerial decision making. Atkinson et al. (2003) analyze mutual funds performance, and find that despite adopting different risk strategies male and female managed funds' exhibit comparable risk and performance records. Matsa and Miller (2013) find no change in Norwegian firms' leverage after the introduction of the 40% quota for women participation on boards.

Using a sample of 2000 US firms from 1996 to 2010, Sila et al. (2016) investigate the relationship between the presence of women on boards and the equity risk and find no gender-related differences. Motivated by the Lehman Sisters hypothesis, Adams and Ragunathan (2015) focus their study on 300 large publicly listed US banks over the time period around the financial crisis of 2007-2008. They find no evidence that gender diverse boards lead to more or less risky policies; however, they report that banks with more female managers perform better during the financial crisis.

Most of the studies that investigate gender-diversity on boards do not disaggregate executives given the small proportion of women in the corporate directorship (McCann and Wheeler, 2011). When assessing women impact on corporate risk, this thesis distinguishes between three different functions: CEOs, executives and non-executive directors.

III. Data and Methodology

1. Sample Description

The chosen sample consists of 132 companies of the Financial Times Stock Exchange (FTSE) 100 index. Data on companies' financial measures is extracted from Thomson Reuters Eikon database. The Balance Sheet and the Income Statement are extracted for each individual company to obtain the financial measures. Data on board-gender diversity is hand collected from annual reports issued by the University of Cranfield and sponsored by Barclays Bank among other influential institutions. This university issues annual reports since 1999 providing the number of women on the boards of the FTSE 100 constituents. The data time span is 11 years from 2005 until 2015. As the index composition changes over time, only companies with at least three years of data are included. The final sample comprises 132 companies with data for at least three years from 2005 until 2015 and a total of 1016 observations. The next subsections detail all the variables that are used in the analysis. Appendix A comprises all the variables and their definitions.

2. Variables

2.1. Dependent Variables

The corporate performance is defined using three measures as dependent variables: return on assets (*ROA*); return on equity (*ROE*); the ratio of operating income to the total assets (*OI/TA*). *ROA* is computed by dividing the net income over the total assets. *ROE* is computed by dividing the Net income over the Total equity. *OI/TA* is the ratio of the operating income over the total assets. The choice of these variables is consistent with studies investigating the effect of gender on boards' performance. ROA and ROE are among the most commonly used metrics to reflect the profitability of firms (Shrader et al., 1997). Du Toit et al. (2007) identify these ratios among the favorite indicators of firms' overall performance in the literature. ROA is used by Cole (2013), Carter et al. (2010) and Adams and Ferreira (2009) as a proxy for corporate performance. ROE is also a common profitability measure across the gender literature (Catalyst, 2007; Adams, 2016). Finally, the OI/TA performance measure is consistent with Frank and Goyal (2007) as well as Smith et al. (2006) among others. In fact, OI/TA is reported to be a suitable measure of firm's productivity as it measures the earning power of assets (Altman, 1968).

The corporate risk dependent variable is computed by dividing the total long term debt by the sum of the total equity and the total long-term debt (*DED*). This is also a common proxy for

risk in the literature on boards' gender diversity (Faccio et al., 2016; Huang and Kisgen, 2013). This variable indicates the financial health of companies. Faccio et al. (2016) explain that given a negative shock, the higher this ratio, the stronger the impact of the shock on firms' profitability. The intuition behind using this proxy is that a high leverage ratio is a signal for financial distress. Moreover, the leverage ratio approximates both the risk and the complexity of firms. In case of financial distress, firms are more inclined towards risky activities (Sila et al., 2016).

2.2. Independent Variables

CEO is a dummy variable that takes the value 1 when the Chief Executive Officer is woman and 0 otherwise consistent with the literature (Martin et al., 2009; Faccio et al., 2016; Frank and Goyal, 2007; Huang and Kisgen, 2013). *CEO/CFO* is another dummy that takes the value 1 when the Chief Financial Officer or the Chief Executive Officer is a woman and 0 otherwise. The relevance of the *CFO* is documented in the literature by Bertrand and Schoar (2003) who identify this position as decisive to the financial strategy of firms. In fact, CFOs are found to be as important as CEOs in the corporate decision making process (Huang and Kisgen, 2013). *CFO* is a dummy that takes the value 1 to indicate the presence of a female Chief Financial Officer and 0 otherwise. Consistent with the literature, the *CFO* variable is only used in the risk regressions.

The third gender variable (*Executive*) is a dummy that takes 1 if there is at least one female executive director sits on the board and 0 otherwise. *CEO, CEO/CFO,* and *Executive* are three independent variables meant to capture the impact of female executive directors on the financial performance and risk taking.

The impact of the non-executive female directors on board is also investigated. Based on the literature, common measures of gender diversity include a dummy that takes 1 if there is at least one woman on the board and zero otherwise (Cole, 2013; Campbell and Minguez-Vera, 2008). Therefore, *Non-Executives* is introduced as dummy that takes the value 1 if there is at least one woman non-executive director seats on the board. Other authors follow the critical mass theory: at least three women should belong to the board of directors in order to observe an impact on the corporations. These include Liu et al. (2014) who report that the presence of only one woman might not allow her to be influential. The intuition behind this reasoning is that women as a minority in top management would only have their voice heard once they reach a critical mass (Kristie, 2011). Following this reasoning, *3Non-Executives* is an additional

dummy that takes the value 1 if at least 3 women non-executive directors belong to the board. In sum, to capture the impact of women in the non-executive team, two additional variables are included in the analysis: *Non-Executives* and *3Non-Executives*.

2.3. Control Variables

Other variables are included to control for firms' growth, complexity and lifecycle. The first control variable is the total asset growth (*Growth*) computed as the yearly percentage change in total assets. This variable allows controlling for the growth of the firm (Titman and Wessels, 1988). Guay (1999) suggests that firms with larger growth opportunities are more prone to engage in risky activities. On the other hand, Lipson et al. (2009) document that a higher asset growth signals lower risk taking activities. On the stock market literature, many authors find evidence of an asset growth effect on market returns. The asset growth effect suggests that firms with low (high) asset growth rates earn higher (lower) returns. Cooper et al. (2008) find that this effect is due to managerial overinvestment. Given the relevance of this measure and its links to risk, performance and corporate governance, *Growth* is computed as the total asset growth and is introduced as a control variable in the regressions.

FirmSize is computed as the natural logarithm of total assets to control for the size of the firms. Sila et al. (2016) among others, identify an inverse relationship between firms' size the size of and corporate risk taking. Cole (2013) asserts that firms' size is an important factor to take into account when assessing firms' probability of financial distress. The rationale behind this reasoning is the difference in the access to the financing channels. It is generally easier for large firms to borrow from banks and access diverse sources of credit. Du Rietz and Henrekson (2000) find that if not controlling for firm size, women directors underperformed their male counterparts. However, once the firm size control variable is introduced, the significance of these results vanished. Therefore, *FirmSize* is introduced a second control variable in the regressions.

FirmAge is the third control variable computed as the natural logarithm of 1 plus the years since incorporation of firms. This variable is commonly used in the literature to control for the life cycle of firms (Faccio et al., 2016; Sila et al., 2016). The intuition behind using this variable is that leverage and profitability vary across the firm's life stage and maturity.

The fourth control variable is *Tangibility* computed as the ratio of fixed to total assets. This measure is consistently used in the gender literature to control for firms' characteristics (Faccio et al. 2016; Cole, 2013).

In the corporate governance literature, Conyon et al. (1998) suggest that a large board of directors destroys corporate value. In a recent study, the size of boards is reported to have a negative impact on corporate performance using a sample of UK firms (Guest, 2009). Moreover, Adams and Ferreira (2009) find that firms with smaller boards perform better. *BoardSize* is therefore introduced as a fifth control variable consistent with Huang and Kisgen (2013), Levi et al. (2014) and Sila et al. (2016) among others. The 5 aforementioned control variables are used in both corporate performance and risk regressions to control for firms' characteristics.

In the performance regressions the ratio of total long-term debt to total assets (*Leverage*) is also introduced as a control variable in addition to the five aforementioned variables *FirmSize*, *FirmAge*, *Tangibility*, *BoardSize* and *Growth*. In fact *Leverage* computed as the ratio of long-term debt to total assets is commonly used as a control variable when the dependent variable is a performance proxy such as *ROA*, *ROE* and *OI/TA* (Liu et al., 2014). Total long-term debt over total assets is a ratio that controls for leverage and is expected to have a negative coefficient with profitability measures (Titman and Wessels, 1988). The variable (*Leverage*) is only used in the performance regressions and is not included in the risk regression analysis.

In the risk taking regressions, *OIG* is computed as the yearly percentage change in the operating income and introduced in addition to the five control variables (*FirmSize*, *FirmAge*, *Tangibility* and *BoardSize*) control variables. Consistent with the literature, when the dependent variable is a risk proxy, one should control for profitability to account for differences in the management quality (Faccio et al., 2016). *OIG* is only used in the risk regression and is not included in the performance regression analysis.

3. Sample Description

In Table 1, the descriptive statistics of the sample are reported. The sample is characterized by a low representation of women in both executive and non-executive positions. Despite the progress of women in the attainment of such positions, they are still rare in the boards of industrialized and advanced economies such as the UK. 36% of the firms have at least one female executive director. However, the highest number of female executive directors

among the firms in the sample is 2. However, non-executive directors are more common among the FTSE 100 boards with firms having up to 6 women non-executive directors.

The sample includes 132 firms and 1016 observations. The number of observations drops to 882 when computing the *OIG* and *Growth* as these are growth variables computed as the yearly percentage change. The mean and the median for both the control and the dependent variables are reasonably close. The low representation of female directors is illustrated in Table 1 through the descriptive statistics of the various gender dummy variables. The median and the mean for the variable *Non-Executives* are the highest compared to the rest of the gender variables. This suggests that the sample comprises more female non-executive directors relative to the other studied positions. As expected, the descriptive statistics exhibit the low representation of female executive directors. The median for the all executive gender variables is null.

In order to avoid spurious outliers, the accounting variables are winsorized at the top and bottom 1% in line with Faccio et al. (2016) among others.

The correlation matrix is computed to prevent multicollinearity between the variables which might induce spurious results. Reported in Appendix B, the matrix does not show a high correlation between two variables that might result in multicollinearity. The only exception is the correlation between *FirmSize* and *BoardSize* of the order of 0.52 which is still below the rule of thumb of 0.7 as outlined by Brooks (2008). The performance variables as well as the gender variables are highly correlated as expected.

Table 1: Descriptive Statistics

This table displays the summary statistics for the variables used throughout the analysis. The displayed statistics are: the mean, median, the standard deviation (SD), the minimum (Min) and the maximum (Max). The definition of the variables is available in Appendix A.

Variable	Mean	Median	SD	Min	Max	Observations
CEO	0.035	0	0.185	0	1	1016
CEO/CFO	0.058	0	0.235	0	1	1016
CFO	0 .029	0	0.170	0	1	1016
Executives	0.177	0	0.382	0	1	1016
Non-Executives	0.866	1	0.341	1	0	1016
3Non-Executives	0.262	0	0.440	0	1	1016
ROE	0.123	0.135	0.100	-0.227	0.320	1016
ROA	0.057	0 .053	0.055	-0.106	0.208	1016
OI/TA	0.082	0 .078	0.073	-0.118	0.292	1016
Growth	0.040	0 .043	0.097	-0.192	0.219	882
OIG	0.006	0.034	0.360	-0.942	0.856	882
Leverage	0.183	0.175	0.128	0.001	0.482	1016
DED	0.359	0 .350	0.138	0.104	0.649	1016
BoardSize	11.13	11	2.565	5	21	1016
FirmSize	9.528	9.121	1.797	4.877	14.69	1016
FirmAge	2.982	2.944	0.962	0.693	4.875	956
Tangibility	0.234	0 .142	0.224	0,001	0.715	1016

4. Regression Models

Following the literature, the regression model used is a Fixed Effect Ordinary Least Square model with robust standard errors in order control for serial correlation and heteroskedasticity (Faccio et al. 2016; Adams 2016). The choice of the fixed effects model is motivated by its property to account for firms' fixed effects in order to mitigate the issue of endogeneity. In fact, this model allows controlling for the unobservable firm characteristics that might bias the results (Adams, 2016). In order to validate the choice of the fixed effects model, the Hausmann test is applied to choose between the random effects and the fixed effects models. The null hypothesis of the test is rejected pointing the suitability of the fixed effects model.

Two types of dependent variables are used to proxy for risk and performance distinctively as illustrated by equation (1) and (2).

$$Performance_{i,t} = \alpha_0 + \beta_1 Gender_{i,t} + \beta_2 DA_{i,t} + \beta_3 X_{i,t} + \varepsilon_{it} \quad (1)$$

$$Risk_{i,t} = \alpha_0 + \beta_1 Gender_{i,t} + \beta_2 OIG_{i,t} + \beta_3 X_{i,t} + \varepsilon_{it} \quad (2)$$

The regression represented by equation (1) is run with three distinct proxies for $Performance_{i,t}$: *ROA*, *ROE* and *OI/TA*. *ROA* is the return on assets, *ROE* is the return on equity and *OI/TA* is the operating income divided by the total assets.

In equation (2) the dependent variable $Risk_{i,t}$ is *DED* calculated as the ratio of total long term debt to total long term debt plus total equity. *OIG* represents the operating income *Growth* that is used as a control variable in equation (2).

In both equation (1) and (2) $X_{i,t}$ represents the variables that control for firms' characteristics: *Growth* is the yearly percentage change in total asset, *FirmSize* is the natural logarithm of total assets, *FirmAge* is computed as the natural logarithm of 1 plus the years since incorporation of firms, *Tangibility* is computed as the ratio of fixed to total assets and, *BoardSize* is the number of board members.

In both equations, $Gender_{i,t}$ are dummy variables representing gender diversity on boards. To account for women impact as executive directors, $Gender_{i,t}$ takes the value of the dummies *CEO, CEO/CFO, Executives*. To account for women representation on the board of independent directors the variable $Gender_{i,t}$ takes the value of the variables *Non-Executives* and *3Non-Executives*. Appendix C details the regression models.

5. Endogeneity

When investigating the impact of gender on the corporate risk and performance, issues of endogeneity arise. In econometric terms, endogeneity arises when the independent variable of interest is correlated with the error term in the regression. Two main drivers of endogeneity are: unobservable factors and reverse causality (Adams, 2016). In fact, the heterogeneity in firms' characteristics, complexity and lifecycle is likely to bias the results. That is why control variables such as the firm age and size are included in the regressions. However, some other characteristics cannot be measured and included as control variables. Some instances are firms' and directors' characteristics that are omitted or simply immeasurable resulting in the omitted variable bias. This bias is addressed by relying on the fixed effects regression consistent with the literature on gender diversity. The culture of the corporations is an instance of the omitted variable bias. The firm fixed effects model demeans the variables to account for such time invariant effects (Adams, 2016).

However, there are also factors that vary over time for all firms. To control for time effects, the regression model introduces year dummies. This allows accounting for economy wide fluctuations in line with Liu et al. (2014). Time fixed effects could be tax regulations and changes that affect all firms in the same year. Controlling for this effect is a further attempt to mitigate endogeneity issues.

Another highly debated concern is the reverse causality. It is unclear whether the female CEO joined an originally profitable or risky firm. A number of studies suggest that women tend to join good performing firms that have low risk. These include Farrell and Hersch (2005), who explain this theory by the external pressures for board diversity combined with the rarity of women directors. On the opposite stream, some studies report that women are most likely to be appointed to leadership positions in risky firms and in times of financial distress. This theory is commonly referred to as the glass cliff phenomenon (Ryan and Haslam, 2005). Therefore, the control variables, the firm fixed effects model and the year dummies do not suffice to address potential endogeneity issues. To mitigate the problems associated with causality and simultaneity, the independent variables are lagged by one period. This technique mitigates reverse causality issues. Moreover, the effect of women directorship takes time to reflect on the corporate performance and risk. Regressing women representation at the same period might not be the best way to assess their impact. Therefore, lagging the independent variables might be more suitable. This technique is borrowed from Farrell and Hersch (2005) and Carter et al.

(2010). In a more recent study Borghesi et al. (2016) use this technique to mitigate endogeneity issues. However, this is not enough to address reverse causality; in fact, another method is the instrumental variable technique. More about the instrumental technique and its use in the literature is discussed in the Limitations and Future Research section.

IV. Results

1. Female Directors & Corporate Performance

1.1. Fixed Effects OLS Regressions

Table 2, Table 3 and Table 4 report the regression results of the OLS fixed effects model with robust standard errors including year dummies to control for time fixed effects. The performance measures *ROE*, *ROA* and *OI/TA* are regressed on the gender variables while controlling for selected firm characteristics and the size of the board of directors. Table 2 and Table 3 report results for the CEO and the executive directors respectively. Table 4 reports the results associated with the non-executive directors.

In Table 2, the gender variable *CEO* is positive and statistically significant across all three performance measures. The regression models (1) and (3) with *ROE* and *OI/TA* as dependent variables respectively, show the positive impact of the variable *CEO* with a significance level of 1%. In the regression model (2) the female CEOs' impact is also significant at the 5% level, with the *ROA* as the dependent variable. These results indicate that female CEOs have a positive and significant impact on the performance of the firm measured by three different profitability metrics.

These findings are in line with multiple instances in the literature. Liu et al. (2014) find that female CEOs have a positive and significant impact on the corporate performance measured by *ROA*. Khan and Vieito (2013) and Peni (2014) find that female CEOs are associated to higher *ROA*s. Smith et al. (2006) also find that female CEOs have a strong positive impact on corporate performance measured by *OI/TA* profitability metric. Dezső and Ross (2008) also document female CEOs' positive impact on firms' ROA and ROE. Studies such as the Catalyst (2005) assert the positive impact of women CEOs on the ROE among other performance measures.

The positive impact of women CEOs on corporate performance could be explained by a variety of factors. Peni (2014) attributes this finding to women's devotion in this leadership role that is usually particularly hard for them to reach. Only women who demonstrate "special

talent" would be able to reach such positions as a consequence of the glass ceiling (Peni, 2014). In line with this reasoning, Krishnan and Park (2005) suggest that the barriers faced by women equip them for the various challenges of the top management positions. Moreover, Krishnan and Park (2005) supplement this reasoning by the unique cognitive and emotional skills that characterize female leaders. In fact, women's success as top managers is often associated to their feminine managerial attributes that include collaboration, teamwork and innovation (Dezső and Ross, 2008; Glass and Cook, 2015). The positive impact realized on the corporate performance reflects the benefits of diversity within the firm. It also shows that beyond the gender stereotypes and the "think manager, think male" perspective, female leaders could be a valuable asset for corporations.

Table 2: Fixed Effects Regression: Corporate Performance & the CEO

This table presents the results of the fixed effects regression following the Performance model. Three dependent variables are used to proxy for performance. *ROE* is the net income over the total equity. *ROA* is the net income over total assets. *OI/TA* is the operating income divided by the total assets. The gender variable CEO is a dummy that takes the value 1 if the CEO is a woman. Independent variables are introduced to control for firms' characteristics. *Leverage* is the total long-term debt divided by the total assets. *Growth* is the yearly percentage change in total assets. *BoardSize* represents the size of the board. *FirmSize* is the natural logarithm of total assets. *Tangibility* is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively

	(1) ROE	(2) ROA	(3) OI/TA
CEO	0.066***	0.019**	0.037***
	(0.021)	(0.009)	(0.010)
Leverage	-0.254***	-0.172***	-0.193***
	(0.075)	(0.046)	(0.047)
Growth	0.243***	0.107***	0.105***
	(0.048)	(0.026)	(0.029)
BoardSize	0.003	0.001	-0.001
	(0.002)	(0.001)	(0.001)
FirmSize	-0.015	-0.023**	-0.035***
	(0.020)	(0.009)	(0.011)
FirmAge	0.022	0.001	0.010
	(0.030)	(0.017)	(0.019)
Tangibility	-0.070	-0.045*	-0.056
	(0.053)	(0.026)	(0.052)
Constant	0.221	0.287***	0.435***
	(0.221)	(0.085)	(0.108)
No. of observations	839	839	839
Number of firms	132	132	132
R-squared	0.170	0.184	0.200
Firm fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES

In Table 3, the same regression models are replicated in order to investigate the effect of two other gender variables. The first variable is *CEO/CFO* that indicates the presence of a woman CEO or CFO. The coefficient of the *CEO/CFO* gender variable is significant with the *ROE* performance measure at the 5% level as shown in regression (1). This implies that women CFOs and CEOs have a positive impact on the return on equity of the firms. The *Executives* variable indicates the presence of a female executive director and is positive and significant with the *ROE* performance metric at the 10% level in regression (2). These findings suggest that women are more likely to have a positive impact on the corporate performance when they are the CEOs. The significant impact that *CEO/CFO* and *Executives* dummies have on the corporate performance metric finds substantial support in the literature (Krishnan et Park, 2005; Francoeur et al., 2008; Perryman et al. 2016; Smith et al., 2006). Francoeur et al. (2008) find consistent results using the same metric ROE.

However, the absence of the female executives' impact across the regressions with *ROA* and *OI/TA* suggests that women in executive positions other than CEO will not necessarily influence the corporate performance. To explain this finding, one can suggest that women can be considered as tokens in any executive position excluding the CEO as they represent a minority in the directors' team. In fact, in a male dominated executive board, the participation of female directors might not result in a significant impact. The maximum number of women in the executive team is 2 in the studied sample; thus, another hypothesis could be that women might only have an impact when they reach a critical mass (Kristie, 2011; Liu et al. 2014). Moreover, the executive directors in this sample hold different roles ranging from Chief Operating Officers to Human Resources Directors. Thus, one can also hypothesize that women directors are more likely to have an impact when they are appointed to executive positions that are more crucial to the strategy of the company (CEO). In sum, the impact of women in executive positions other than the CEO is not consistent throughout the regression models. Therefore, this study cannot firmly conclude that female executive directors other than CEOs enhance corporate performance.

Table 3: Fixed Effects Regression: Corporate Performance & the Executive Directors

This table presents the results of the fixed effects regression following the Performance model. Three dependent variables are used to proxy for performance. *ROE* is the net income over the total equity. *ROA* is the net income over total assets. *OI/TA* is the operating income divided by the total assets. Two gender variables are used: The first is *CEO/CFO* is a dummy that takes the value 1 if the CEO or the CFO is a woman; the second is *Executives* is another dummy that takes the value 1 if there is at least one female executive director on board. Independent variables are introduced to control for firms' characteristics. *Leverage* is the total long-term debt divided by the total assets. *Growth* is the yearly percentage change in total assets. *BoardSize* represents the size of the board. *FirmSize* is the natural logarithm of total assets. *Tangibility* is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively

	ROE		ROA		OI/TA	
	(1)	(2)	(3)	(4)	(5)	(6)
CEO/CFO	0.034**		0.005		0.006	
	(0.017)		(0.007)		(0.0117)	
Executives		0.022*		0.004		0.004
		(0.013)		(0.006)		(0.008)
Leverage	-0.263***	-0.261***	-0.174***	-0.173***	-0.196***	-0.196***
	(0.074)	(0.076)	(0.045)	(0.046)	(0.047)	(0.047)
Growth	0.241***	0.239***	0.107***	0.108***	0.105***	0.106***
	(0.048)	(0.047)	(0.026)	(0.026)	(0.030)	(0.029)
BoardSize	0.002	0.002	0.001	0.001	-0.000	-0.001
	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
FirmSize	-0.014	-0.012	-0.023**	-0.023**	-0.034***	-0.034***
	(0.021)	(0.021)	(0.010)	(0.010)	(0.011)	(0.0110)
FirmAge	0.019	0.015	-0.001	-0.002	0.006	0.004
	(0.031)	(0.031)	(0.017)	(0.017)	(0.020)	(0.020)
Tangibility	-0.066	-0.056	-0.044*	-0.046*	-0.054	-0.055
	(0.053)	(0.053)	(0.026)	(0.026)	(0.053)	(0.053)
Constant	0.225	0.221	0.291***	0.296***	0.444***	0.450***
	(0.223)	(0.227)	(0.086)	(0.085)	(0.109)	(0.108)
No. of observations	839	839	839	839	839	839
Number of firms	132	132	132	132	132	132
R-squared	0.167	0.165	0.182	0.182	0.192	0.192
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

In Table 4, the same regression models are replicated to uncover the impact of women non-executive directors. The first dummy variable *Non-Executives* indicates the presence of at least one female non-executive director. The Second dummy variable *3Non-Executives* indicates the presence of at least three female non-executive directors. Both variables are not significant across the three regression models. These results are in line with Liu et al. (2014) who find that the subsample of women executives reports significant results as opposed to the independent or non-executive directors. Smith et al. (2006) also found significant results for the female CEOs and mixed results when it comes to the rest of women on boards. In fact, the authors report that while women CEOs have a significant positive impact, results for the remaining board members are not consistently significant and exhibit both positive and negative coefficients. Randøy et al. (2006) and Rose (2007) do not report any significant relationship between boards' gender diversity and corporate performance. Although the presence of women non-executive directors did not appear to be significant in this sample, this does not refute the potential benefits of their representation on boards. These results contradict the findings of Erhardt et al. (2003) and Liu et al. (2014) among others. Gender diversity among board members is often reported to enhance the corporate governance and female independent directors are reported to have better attendance rates and to engage more actively in the boards' meetings (Adams and Ferreira, 2009). Therefore, whether boards' gender diversity benefits reflect on the corporate performance measures or not; a gender mix is more likely to bring value than a male or a female dominated team. In fact, having different perspectives would enrich the inputs during the corporate decision making process. This is characterized in the literature by the social identity theory that links diversity in groups to the openness to new perspectives (Tajfel and Turner, 1979).

Table 4: Fixed Effects Regression: Corporate Performance & the Non-Executive Directors

This table presents the results of the fixed effects regression following the Performance model. Three dependent variables are used to proxy for performance. *ROE* is the net income over the total equity. *ROA* is the net income over total assets. *OI/TA* is the operating income divided by the total assets. Two gender variables are used: The first is *Non-Executives* is a dummy that takes the value 1 if there is at least one female non-executive director; the second is *3Non-Executives* another dummy that takes the value 1 if there is at least three female non-executive directors on board. Independent variables are introduced to control for firms' characteristics. *Leverage* is the total long-term debt divided by the total assets. *Growth* is the yearly percentage change in total assets. *BoardSize* represents the size of the board. *FirmSize* is the natural logarithm of total assets. *Tangibility* is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively.

	ROE		ROA		OI/TA	
	(1)	(2)	(3)	(4)	(5)	(6)
Non-Executives	0.010		-0.001		-0.001	
	(0.017)		(0.008)		(0.003)	
3Non-Executives		0.011		0.004		0.005
		(0.010)		(0.005)		(0.006)
Leverage	-0.259***	-0.263***	-0.174***	-0.175***	-0.196***	-0.197***
	(0.076)	(0.076)	(0.046)	(0.046)	(0.047)	(0.047)
Growth	0.244***	0.246***	0.107***	0.108***	0.105***	0.106***
	(0.048)	(0.048)	(0.027)	(0.026)	(0.030)	(0.030)
BoardSize	0.002	0.002	0.001	0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.001)	(0.001)	(0.002)	(0.001)
FirmSize	-0.012	-0.012	-0.023**	-0.022**	-0.034***	-0.034***
	(0.021)	(0.021)	(0.010)	(0.001)	(0.011)	(0.011)
FirmAge	0.012	0.011	-0.002	-0.002	0.004	0.005
	(0.032)	(0.032)	(0.017)	(0.017)	(0.020)	(0.020)
Tangibility	-0.066	-0.058	-0.044*	-0.041	-0.055	-0.050
	(0.054)	(0.054)	(0.026)	(0.026)	(0.053)	(0.052)
Constant	0.228	0.236	0.293***	0.290***	0.449***	0.444***
	(0.223)	(0.223)	(0.088)	(0.087)	(0.111)	(0.110)
Observations	839	839	839	839	839	839
Number of firms	132	132	132	132	132	132
R-squared	0.162	0.163	0.181	0.182	0.192	0.193
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

In Table 2, Table 3 and Table 4 the control variables show consistent effects throughout the regressions. The coefficient of the *Leverage* variable is negative and statistically significant across all three performance models consistent with Liu et al. (2014) findings. This suggests that leverage impacts negatively the financial performance of companies.

The *FirmSize* control variable has a significant negative impact on two of the profitability measures in line with the findings of Guest (2009) who reports a strong negative association between the size and the profitability of firms. However, the *Growth* variable holds a positive and significant coefficient across the three performance models. This suggests growth opportunities are associated to profitability. The *Tangibility* control variable, defined as the portion of long term assets dived by the total assets, shows a significant negative impact on performance when measured by the variable *ROA*.

1.2. Robustness Tests

Table 5, Table 6 and Table 7 report the results of the fixed effects OLS regressions with firm and time fixed effects. To test for robustness, the independent variables are lagged by one period. The rationale behind lagging the variables is considering that the impact of women directors takes time to occur. Carter et al. (2010) lag all independent variables by one period using an OLS fixed effects regression. The authors state that the number of lags that should be used before observing an impact remains an empirical question. This method is also in line with Farrell and Hersch (2005) and Borghesi et al. (2016).

The results in Table 5 report the impact of women CEOs on the corporate performance with lagged independent variables. These results suggest even higher positive coefficients for the *CEO* gender variable. In fact the *CEO* variable exhibits a strong positive impact that is significant at the 1% level across models (1) and (3) regressing the *ROE* and *OI/TA*. This impact is also positive and significant at the 10% level in the *ROA* regression represented by model (3). This robustness exercise reported in Table 5 asserts the positive impact of female CEOs on the firm performance measured by three profitability metrics. The regression results are still consistent and statistically significant even after controlling for firm and time effects with lagged independent variables. In sum, female CEOs appear to have a positive impact on corporate performance upon the robustness checks.

However, the positive impact arising from women representation in the top management team vanishes when the independent variables are lagged, as reported in Table 6. Neither the

CEO/CFO nor the *Executives* gender variables show significant results across the three performance measures. The only exception can be seen in model (1) with the *ROE* performance metric, where the *Executives* gender dummy exhibits a positive coefficient that is significant at the 1%. This table supports the lack of evidence of the executive directors' impact on corporate performance. These results further confirm that women in top management are more likely to have an impact when they are the CEOs.

Lagging the independent variables in Table 7 does not introduce any noticeable difference for the non-executive directors' regressions results. The coefficients for the gender variables remain insignificant. Women non-executive directors do not seem to have an impact on corporate performance consistent with the base case results. Using alternative measures to proxy for non-executive directors' presence in unreported regressions, exhibits similar results. These measures include the percentage of non-executive directors from the total board, and the presence of at least two female non-executive directors.

Finally, across the tables 5 and 6 and 7, the impact of firms' characteristics remains consistent but less significant after checking for robustness. The *Growth* variable is still significant at the 5% and 10% levels across the all the regressions. However, the lagged *Leverage* variable loses significance in all the models. This suggests that the performance of firms is better explained with the leverage in the same period. However, with a single period lag, *FirmSize* seems to have a stronger negative impact that is significant across all models in Table 5 and Table 6.

In sum, upon replication of the regressions with one year lag in the independent variables, most results prove to be robust. However, the executive team other than the CEO does not show a persistent impact on the corporate performance. The non-executive directors' impact remains statistically insignificant similar to the base case results.

Table 5: Robustness Test: Corporate Performance & the CEO

This table presents the results using lagged independent variables. Following the Performance model, a fixed effects OLS regression is used. Three dependent variables are used to proxy for performance. ROE is the net income over the total equity. ROA is the net income over total assets. OI/TA is the operating income divided by the total assets. The gender variable CEO is a dummy that takes the value 1 if the CEO is a woman. Other Independent variables are introduced to control for firms' characteristics. Leverage is the total long-term debt divided by the total assets. Growth is the yearly percentage change in total assets. BoardSize represents the size of the board. FirmSize is the natural logarithm of total assets. Tangibility is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively.

	ROE	ROA	OI/TA
Lagged variables	(1)	(2)	(3)
CEO	0.105***	0.032*	0.057***
	(0.040)	(0.017)	(0.014)
Leverage	-0.039	-0.028	0.027
	(0.080)	(0.037)	(0.044)
Growth	0.093**	0.040**	0.040*
	(0.040)	(0.019)	(0.022)
BoardSize	0.002	0.001	-0.001
	(0.002)	(0.001)	(0.001)
FirmSize	-0.071***	-0.041***	-0.044***
	(0.021)	(0.011)	(0.013)
FirmAge	0.025	0.016	0.029
	(0.031)	(0.019)	(0.021)
Tangibility	-0.129**	-0.083***	-0.090*
	(0.063)	(0.030)	(0.047)
Constant	0.766***	0.420***	0.466***
	(0.214)	(0.094)	(0.119)
No. of observations	682	682	682
Number of firms	115	115	115
R-squared	0.139	0.151	0.158
Firm fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES

Table 6: Robustness Test: Corporate Performance & the Executive Directors

This table presents the results using lagged independent variables. Following the Performance model, a fixed effects OLS regression is used. Three dependent variables are used to proxy for performance. *ROE* is the net income over the total equity. *ROA* is the net income over total assets. *OI/TA* is the operating income divided by the total assets. Two gender variables are used: The first is *CEO/CFO* is a dummy that takes the value 1 if the CEO or the CFO is a woman; the second is *Executives* is another dummy that takes the value 1 if there is at least one female executive director on board. Independent variables are introduced to control for firms' characteristics. *Leverage* is the total long-term debt divided by the total assets. *Growth* is the yearly percentage change in total assets. *BoardSize* represents the size of the board. *FirmSize* is the natural logarithm of total assets. *Tangibility* is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively.

	ROE		ROA		OI/TA	
Lagged Variables	(1)	(2)	(3)	(4)	(5)	(6)
CEO/CFO	0.042		0.011		0.017	
	(0.027)		(0.010)		(0.0130)	
Executives		0.038***		0.007		0.007
		(0.014)		(0.006)		(0.008)
Leverage	-0.045	0.085**	-0.030	0.0370*	0.024	0.038*
	(0.080)	(0.040)	(0.037)	(0.019)	(0.044)	(0.023)
Growth	0.090**	-0.048	0.038*	-0.030	0.038*	0.024
	(0.041)	(0.082)	(0.019)	(0.037)	(0.022)	(0.045)
BoardSize	0.002	0.001	0.001	0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
FirmSize	-0.071***	-0.068***	-0.040***	-0.040***	-0.044***	-0.043***
	(0.021)	(0.020)	(0.011)	(0.0116)	(0.014)	(0.014)
FirmAge	-0.003	0.011	0.013	0.0119	0.022	0.020
	(0.042)	(0.033)	(0.020)	(0.0198)	(0.022)	(0.022)
Tangibility	-0.121*	-0.117*	-0.083***	-0.081***	-0.088*	-0.088*
	(0.065)	(0.067)	(0.030)	(0.031)	(0.047)	(0.046)
Constant	0.852***	0.793***	0.426***	0.429***	0.477***	0.482***
	(0.235)	(0.207)	(0.095)	(0.096)	(0.121)	(0.122)
No. of observations	688	688	688	682	688	688
Number of firms	115	115	115	115	115	115
R-squared	0.127	0.137	0.146	0.147	0.147	0.145
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

Table 7: Robustness Test: Corporate Performance & the Non-Executive Directors

This table presents the results using lagged independent variables. Following the Performance model, a fixed effects OLS regression is used. Three dependent variables are used to proxy for performance. *ROE* is the net income over the total equity. *ROA* is the net income over total assets. *OI/TA* is the operating income divided by the total assets. Two gender variables are used: The first is *Non-Executives* is a dummy that takes the value 1 if there is at least one female non-executive director; the second is *3Non-Executives* another dummy that takes the value 1 if there are at least three female non-executive directors on board. Independent variables are introduced to control for firms' characteristics. *Leverage* is the total long-term debt divided by the total assets. *Growth* is the yearly percentage change in total assets. *BoardSize* represents the size of the board. *FirmSize* is the natural logarithm of total assets. *Tangibility* is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively.

	ROE		ROA		OI/TA	
Lagged Variables	(1)	(2)	(3)	(4)	(5)	(6)
Non-Executives	0.010		-0.001		-0.001	
	(0.017)		(0.008)		(0.003)	
3Non-Executives		0.011		0.004		0.005
		(0.010)		(0.005)		(0.006)
Leverage	-0.259***	-0.263***	-0.174***	-0.175***	-0.196***	-0.197***
	(0.076)	(0.076)	(0.046)	(0.046)	(0.047)	(0.047)
Growth	0.244***	0.246***	0.107***	0.108***	0.105***	0.106***
	(0.048)	(0.048)	(0.027)	(0.026)	(0.030)	(0.030)
BoardSize	0.002	0.002	0.001	0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.001)	(0.001)	(0.002)	(0.001)
FirmSize	-0.012	-0.012	-0.023**	-0.022**	-0.034***	-0.034***
	(0.021)	(0.021)	(0.010)	(0.001)	(0.011)	(0.011)
FirmAge	0.012	0.011	-0.002	-0.002	0.004	0.005
	(0.032)	(0.032)	(0.017)	(0.017)	(0.020)	(0.020)
Tangibility	-0.066	-0.058	-0.044*	-0.041	-0.055	-0.050
	(0.054)	(0.054)	(0.026)	(0.026)	(0.053)	(0.052)
Constant	0.228	0.236	0.293***	0.290***	0.449***	0.444***
	(0.223)	(0.223)	(0.088)	(0.087)	(0.111)	(0.110)
Observations	839	839	839	839	839	839
Number of firms	132	132	132	132	132	132
R-squared	0.162	0.163	0.181	0.182	0.192	0.193
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

2. Female Directors & Corporate Risk

2.1. Fixed Effects OLS Regression

Table 8 reports the results of the OLS fixed effects regressions with robust standard errors including year dummies to control for time fixed effects. The leverage ratio *DED* is regressed on the gender variables while controlling for selected firms' characteristics and the size of the board of directors.

Women CEOs and CFOs seem to decrease firms' risk as measured by the ratio of long-term debt over equity plus long-term debt. Therefore, an additional variable *CFO* is included to study the isolated impact of women CFOs which also proves to be negative and statistically significant at the 5%. These results suggest that women at key executive positions may contribute to a decrease in firm leverage. However, the variable *Executives* does not appear to be significant. Women at certain positions in the executive team are not directly involved with the financing decisions of the firm; therefore, their presence might not necessarily decrease the risk of the corporations. As outlined in the previous section, positions such as Chief Operating Officers and Human Resources would not necessarily allow for an observable impact on firm's leverage.

The findings in this section suggest that women executive directors are inversely related to leverage. This is in line with Faccio et al. (2016) who use the same measure for corporate risk (*DED*) and find that female CEOs reduce leverage.

Multiple studies also find consistent results (Frank and Goyal, 2007; Cole, 2013; Huang and Kisgen, 2013; Levi et al., 2014; Perryman et al., 2016). Frank and Goyal (2007) find that firms are less likely to issue debt when the CEO is a female. Huang and Kisgen (2013) show that female CEOs and CFOs are more conservative. Perryman et al. (2016) and Hutchisnon et al. (2015) find consistent results regarding the presence of women executives.

The most common and "available" explanation for these results is the stereotypical female risk aversion. This gender stereotype finds support in sociological, psychological, and empirical studies. Such stereotypes should be analyzed with caution as they would necessarily influence the appointment of women directors (Mohan, 2014). In fact, it is misleading to generalize the level of risk aversion to the whole gender population. Women are found to have different risk propensities but still exhibit the same performance level as their male counterparts (Atkinson et al., 2003). Women are found to be more risk loving than their male

counterparts (Adams and Funk, 2012). Female directors in the financial industry are found to have different risk propensities than female directors in other industries (Sapienza et al., 2009). This study investigates the impact of women CEOs and executive directors in aggregate terms as team members. This reasoning is in line with Perryman et al. (2016) who confirm that diversity among firms' executive teams results in less corporate risk and a better corporate performance. Female CEOs and female executive directors might adopt more prudent risk strategies than their male counterparts; however, for their strategy to reflect on corporate risk metrics, they need to persuade the remaining executive directors before adopting it (Perryman et al., 2016).

Women in the non-executive team do not seem to have an impact on corporate risk. The results are in line with many findings in the literature (Matsa and Miller, 2013; Adams and Ragunathan, 2015; Sila et al., 2016). Matsa and Miller (2013) find no change in Norwegian firms' leverage after the introduction of the 40% quota for women participation on boards. Adams and Ragunathan (2015) find no evidence of corporate risk reduction when examining the presence of women on boards. Sila et al. (2016) investigate the relationship between the presence of women on boards and the equity risk and find no gender-related differences. These results suggest that the gender composition among non-executive teams does not necessarily influence corporate risk. The interpretation of the obtained results can also be linked to the low representation of women on boards. Once again, women represent a minority on boards; in fact, they are part of a male dominated team. Thus, they may be subject to tokenism especially given the rarity of women sitting on the boards of the studied sample. However, even the *3Non-Executives* variables following the critical mass theory did not appear to be significant. This could be due to the low frequency of the existence of 3 female non-executive directors. Another possible reasoning would question the extent to which the non-executive board has an impact on corporate risk. Given that non-executive directors are not involved in day to day managerial operations, they can only reduce risk through their monitoring role. Adams and Ferreira (2009) suggest that the impact of gender diversity among boards on non-executive directors depends on the internal corporate governance systems. The strength of the internal corporate governance system is a primary condition to achieve corporate risk reduction. Only when this condition is fulfilled that one can draw conclusions about the effect of gender diversity on boards' monitoring. More characteristics about the boards' meetings and involvement in the corporate decisions should be used as control variables in the regressions. This could improve the accuracy of the analysis.

Among the control variables, only the *Tangibility* and the *FirmSize* exhibit coefficients that are statistically significant at the 1% and 10% levels respectively. These variables appear to be positively related to leverage.

Table 8: Fixed Effects Regression - Corporate Risk & Female Directors

This table presents the results of the fixed effects regression following the Risk model. The dependent variable *DED* is the ratio of debt plus equity divided by the total long-term debt. CEO is a dummy that indicates the presence of a female CEO. *CEO/CFO* is a dummy that indicates the presence of a female CFO or CEO. CFO indicates the presence of a female CFO. *Executives* indicates the presence of at least one female executive director. *Non-Executives* is a dummy that indicates the presence of at least one female non-executive director and *3Non-Executives* indicates the presence of at least three female non-executive directors. *OIG* is the yearly percentage change of the operating income. *Growth* is the yearly percentage change in total assets. *BoardSize* represents the size of the board. *FirmSize* is the natural logarithm of total assets. *Tangibility* is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively.

	DED					
	(1)	(2)	(3)	(4)	(5)	(6)
CEO	-0.074**					
	(0.030)					
CEO/CFO		-0.055***				
		(0.017)				
CFO			-0.034**			
			(0.014)			
Executives				-0.022		
				(0.019)		
Non-Executives					-0.027	
					(0.020)	
3Non-Executives						0.013
						(0.014)
OIG	0.001	0.001	-0.023	-0.001	0.000	-0.001
	(0.0111)	(0.011)	(0.046)	(0.011)	(0.011)	(0.011)
Growth	-0.024	-0.021	0.001	-0.019	-0.024	-0.022
	(0.045)	(0.045)	(0.011)	(0.046)	(0.045)	(0.046)
BoardSize	-0.005	-0.005	-0.005	-0.004	-0.004	-0.006*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
FirmSize	0.055***	0.054***	0.053***	0.0521**	0.052**	0.054***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
FirmAge	-0.038	-0.036	-0.026	-0.029	-0.027	-0.025
	(0.041)	(0.040)	(0.042)	(0.042)	(0.043)	(0.043)
Tangibility	0.160*	0.156*	0.153*	0.145*	0.157*	0.163*
	(0.085)	(0.085)	(0.085)	(0.086)	(0.086)	(0.085)
Constant	-0.047	-0.049	-0.068	-0.048	-0.034	-0.075
	(0.211)	(0.210)	(0.214)	(0.217)	(0.216)	(0.214)
No. of observations	839	839	839	839	839	839
Number of firms	132	132	132	132	132	132
R-squared	0.062	0.062	0.056	0.057	0.057	0.056
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

2.2. Robustness Tests

Table 9 presents OLS regressions with firm and year fixed effects with all the independent variables being lagged by one period. The rationale behind lagging the variables is allowing the impact of women directors to occur through time. Carter et al. (2010) lag all independent variables by one period using an OLS fixed effects regression and controlling for time fixed effects. The authors state that the number of lags that should be used before observing an impact remains an empirical question. This method is also in line with Farrell and Hersch (2005) and Borghesi et al. (2016).

After the performance of robustness checks, the significance of the coefficients of the gender variables marginally decreases. However, both the joint and isolated impact of CEOs and CFOs on firms' risk remain negative and statistically significant. This confirms that women CEOs and CFOs decrease firms' leverage. The impact of women representation in the executive team once again shows to be discriminatory: only CEOs and CFOs appear to decrease risk. The impact of the presence in the remaining executive position is not significant.

The variable *Non-Executives* turns significant at the 10% level. This translates into some evidence that female independent directors might reduce risk measured by the *DED* independent variable. The second dummy *3Non-Executives* remains statistically insignificant. This may be due to the rarity of the presence of three non-executive female directors in the sample. The potential inverse relationship between women non-executive directors and risk finds some support in the literature (Carter et al., 2014). The two main arguments are: risk aversion and tough monitoring (Croson and Gneezy, 2009; Adams, 2009).

The control variables coefficients are consistent with the base case results. The lagged *Tangibility* variable is significant at the 1% level with a positive coefficient. However, the *FirmSize* variable is slightly less statistically significant than in the base case.

Table 9: Robustness tests – Corporate Risk & Female Directors

This table presents the results using lagged independent variables. Following the Risk model, a fixed effects OLS regression is used. The dependent variable *DED* is the ratio of debt plus equity divided by the total long-term debt. *CEO* is a dummy that indicates the presence of a female CEO. *CEO/CFO* is a dummy that indicates the presence of a female CFO or CEO. CFO indicates the presence of a female CFO. *Executives* indicates the presence of at least one female executive director. *Non-Executives* is a dummy that indicates the presence of at least one female non-executive director and *3Non-Executives* indicates the presence of at least three female non-executive directors. *OIG* is the yearly percentage change of the operating income. *Growth* is the yearly percentage change in total assets. *BoardSize* represents the size of the board. *FirmSize* is the natural logarithm of total assets. *Tangibility* is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively.

	DED					
Lagged variables	(1)	(2)	(3)	(4)	(5)	(6)
CEO	-0.062*					
	(0.0415)					
CEO/CFO		-0.059**				
		(0.0270)				
CFO			-0.057*			
			(0.0334)			
Executives				-0.024		
				(0.0264)		
Non-Executives					-0.038*	
					(0.021)	
3Non-Executives						0.018
						(0.015)
OIG	0,001	0.001	-0.003	-0.003	0.001	-0.001
	(0.012)	(0.012)	(0.051)	(0.053)	(0.012)	(0.013)
Leverage	-0.00926	-0.006	-0.001	-0.002	-0.008	-0.005
	(0.0515)	(0.051)	(0.012)	(0.012)	(0.051)	(0.052)
BoardSize	-0.00277	-0.002	-0.002	-0.001	-0.002	-0.004
	(0.00431)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
FirmSize	0.058**	0.060**	0.057**	0.056**	0.053*	0.058**
	(0.027)	(0.026)	(0.027)	(0.027)	(0.027)	(0.027)
FirnAge	-0.032	-0.024	-0.023	-0.024	-0.027	-0.022
	(0.053)	(0.060)	(0.052)	(0.053)	(0.053)	(0.054)
Tangibility	0.267***	0.259***	0.263***	0.260***	0.265***	0.278***
	(0.086)	(0.083)	(0.084)	(0.083)	(0.084)	(0.083)
Constant	-0.150	-0.189	-0.168	-0.164	-0.010	-0.173
	(0.331)	(0.343)	(0.329)	(0.334)	(0.330)	(0.330)
No. of observations	688	688	688	688	688	688
Number of firms	177	117	115	117	115	115
R-squared	0.066	0.068	0.065	0.065	0.068	0.065
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

An additional robustness test is performed: controlling for industry effects. In fact, instances in the literature assert that women in the financial sector are not as risk averse as women in other industries (Sapienza et al., 2009). Other authors find evidence that women are more risk loving than their male counterparts in the financial industry (Adams and Funk, 2012; Adams and Ragunathan, 2014). Berger et al. (2014) is among the exceptions in the literature who find that find women directors are related to an increase in corporate risk. Their findings also reside in the banking context. One alternative could be to exclude the financial companies; however, this results in a substantial reduction in the number of observations. This study opts for controlling for industry effects. The model used throughout the analysis is the fixed effects model given that the Hausmann test provided a p-value of 0.000 which points the suitability of the fixed effects model. However, the nature of this model does not allow controlling for time invariant variables such as industry dummies. Therefore, industry dummies are introduced in a random effects linear regression model. The results of the random effects OLS regressions with industry and year effects are consistent with the base case results. Among the used gender variables, only CEO and *CEO/CFO* prove to be significantly negatively related to *Leverage*. This robustness test suggests that women CEOs and CFOs reduce corporate leverage regardless of the industry. The results of the random effect tests are presented in Table 10.

This section relies on two methods to test the sensitivity of the impact of women directors the on corporate risk. Overall, the results suggest that women CEOs and CFOs might reduce corporate leverage. However, when it comes to the impact of the remaining members of the board, only a marginal evidence of corporate risk reduction is documented.

Table 10: Robustness tests – Corporate Risk & Female Directors

This table presents the results of a random effects OLS model with years and industry dummies. The dependent variable *DED* is the ratio of debt plus equity divided by the total long-term debt. CEO is a dummy that indicates the presence of a female CEO. *CEO/CFO* is a dummy that indicates the presence of a female CFO or CEO. CFO indicates the presence of a female CFO. *Executives* indicates the presence of at least one female executive director. *Non-Executives* is a dummy that indicates the presence of at least one female non-executive director and *3Non-Executives* indicates the presence of at least three female non-executive directors. *OIG* is the yearly percentage change of the operating income. *Growth* is the yearly percentage change in total assets. *BoardSize* represents the size of the board. *FirmSize* is the natural logarithm of total assets. *Tangibility* is the ratio of fixed to total assets. The regression is performed with robust standard errors displayed in parentheses. ***, **, * indicate 1%, 5% and 10% significance level respectively.

	DED					
	(1)	(2)	(3)	(4)	(5)	(6)
CEO	-0.054**					
	(0.026)					
CEO/CFO		-0.038**				
		(0.0156)				
CFO			-0.024			
			(0.017)			
Executives				-0.024		
				(0.016)		
Non-Executive					-0.013	
					(0.018)	
3Non-Executive						0.009
						(0.013)
OIG	-0.005	-0.005	-0.005	-0.006	-0.004	-0.005
	(0.012)	(0.012)	(0.012)	(0.012)	(0.016)	(0.011)
Growth	0.001	0.003	0.000	0.005	-0.002	0.001
	(0.042)	(0.042)	(0.042)	(0.043)	(0.041)	(0.042)
BoardSize	-0.003	-0.003	-0.003	-0.002	-0.002	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
FirmSize	0.002	0.002	0.002	0.002	0.0021	0.002
	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.007)
FirmAge	0.001	0.001	0.011	0.011	0.011	0.011
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Tangibility	0.036	0.034	0.031	0.030	0.030	0.033
	(0.048)	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)
Constant	0.301***	0.301***	0.296***	0.295***	0.298***	0.301***
	(0.094)	(0.093)	(0.093)	(0.093)	(0.095)	(0.095)
No. of observations	839	839	839	839	839	839
Number of firms	132	132	132	132	132	132
R-squared	0.066	0.064	0.642	0.070	0.070	0.070
Firm fixed effects	NO	NO	NO	NO	NO	NO
Year fixed effects	YES	YES	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES	YES	YES

V. Discussion

Women CEOs seem to have a strong positive impact on corporate performance measured by three different metrics. Moreover, both female CEOs and CFOs are found to be negatively associated to corporate leverage. Evidence of the potential positive impact of female executives other than the CEOs is also apparent throughout the regressions; however, its significance decreases upon the robustness checks. Female executive directors in this sample hold different roles ranging from Chief Operating Officers to Human Resources directors; therefore, one can conclude that women are more influential as CEOs than in other executive positions. In fact, CEOs enjoy the highest rank in the company. The CEO position allows access to strategic information and control over the key decisions of the firm. Moreover, the maximum number of women in the executive team is 2 in the studied sample; thus, another hypothesis could be that women might only have an impact once they reach a critical mass (Kristie, 2011; Liu et al. 2014).

Women on boards as non-executive directors do not seem to have an impact on corporate performance and risk. One can attribute the absence of their impact to tokenism. The theory of tokenism was used in the late nineties to describe minorities such as female directors who represent a particular demographic group (Kanter, 1977). A Token is an individual who is judged based on stereotypes rather than managerial performance (Kanter, 1977; Liu et al. 2014). Following this reasoning, one can argue that few women present in a board might not often succeed to voice their opinions in the decision making process. Moreover, as opposed to CEOs and executives, independent board members are not involved in the day to day managerial decision making. Therefore, boards of non-executive directors meet less frequently than top managers which might hinder the impact of diversity in their corporate decision making process. Consistent with this reasoning, Adams and Ferreira (2009) suggest that the impact of gender diversity among boards of non-executive directors depends on the internal corporate governance systems. Accounting for the frequency of boards' meetings and their involvement in the decision making could help controlling for the strength of the internal corporate governance systems.

In sum, this thesis stresses the benefits of gender diversity on corporate boards. Female directors are part of a larger team of executives with whom corporate decision making is shared; therefore, their positive impact could be attributed to the benefits of diversity. In line with Post and Byron (2014) and Perryman et al. (2016) among others, this study stresses the

benefits of having different perspectives as a result of gender diversity. Women leadership style, although not necessarily universal, might also bring an added *value* to the corporations. Krishnan and Park (2005) assert the unique cognitive and emotional skills that characterize female leaders. In fact, women's success as top managers is often associated to their feminine managerial attributes that include collaboration, teamwork and innovation (Dezső and Ross, 2008; Glass and Cook, 2015).

VI. Limitations and Future Research

Despite being comprehensive by looking at both risk and performance and differentiating between the executive and non-executive positions, this thesis has a number of limitations. Results are drawn from the largest UK corporations. Therefore, they might not be representative of small companies and non-western cultures. The size of the sample and the unbalanced nature of the panel data represent a further limitation in this study. This sample also suffers from the low representation of female executives which decreases the accuracy of the results.

From an econometrical viewpoint, lagging the independent variables to mitigate endogeneity issues does not suffice to account for reverse causality. Moreover, this technique resulted in a substantial reduction in the number of observations which weakened the regression models. A common approach to address endogeneity is the instrumental variable method. However, finding an instrument to examine gender differences in corporate settings is consensually an incredible challenge. Therefore, more research should be done in order to facilitate the identification of suitable instruments in this context. Two common instrumental variables are used in the academic articles within this emerging literature. The first is a variable based on a state gender equality index applicable to only US companies. The second is based on the fraction of male directors who sit on gender diverse boards both in the sample firms and outside the studied sample. However, information about male directors is not provided in the Cranfield reports from which gender data is retrieved in this study. Given that the first variable is non-applicable and the second is inaccessible, this study fails to use the instrumental variable technique.

Moreover, subjective measures based on market value such as the Tobin's Q, would complement this study. As the accounting based measures that are used are commonly criticized as being an input of the corporation, they are subject to reporting biases.

The regressions in this study do not control for individual characteristics of the directors such as the age and education. In fact, these characteristics might make a difference in the performance and risk propensity of the directors. In addition to the observable characteristics, exploring deep-level diversity is suggested by Torchia et al., (2011) as an alternative to better assess the dynamics of the boards' composition. Deep-level diversity is the unobserved diversity among team members such as personality, background and skills (Milliken and Martins, 1996). Proxies for deep-level characteristics are challenging yet not impossible to identify making it an interesting area for future research.

Future research might also tackle the persistent wage gap between male and female directors. Observing whether this gap is tightened with an increase in diversity is a promising research area. In fact, if female leaders receive lower compensation holding the same position than their male counterparts, this might result in low self-esteem which would in turn affect their performance. Finally, rather than focusing on female impact on corporate outcomes, future research should direct efforts towards studying the impact of gender diversity on the team dynamics. As the corporate decision making process is the product of teams of directors and board members, accounting for the degree of minorities' participation in this process may shed more light on the impact of their inclusion as directors. Surveys and case studies might be more suitable to explore this research area.

VII. Conclusion

Are women the superheroes of the corporate world? The impact of gender diversity on corporate outcomes has brought an overwhelming literature with contradictory findings. In fact, conclusions and results vary from one study to another, and the opposite would be surprising. The inconsistency in the published findings is only a proof that universal truths do not fit in studies that measure complex variables such as gender-diversity. The results in this study do not allow for definitive conclusions as they do not entirely control for endogeneity issues. Nevertheless, this study provides evidence that female CEOs enhance corporate performance and decrease firms' risk. Women in executive positions also seem to have a positive impact on firms' outcomes. However, this study does not claim that women reduce risk and produce better corporate outcomes. The results rather suggest that diversity should be welcomed within the corporate decision making bodies.

Although some might be superheroes, not all women are the same. Moreover, their impact is conditioned by the nature and the extent of their involvement in the corporate

decision making among other factors. Therefore, if women are not treated as equal board members, their representation is unlikely to have an impact. This study suggests that the corporations and other institutions should help women breaking through the glass ceiling. Their help should start at the very first touch-points of socialization such as the educational institutions. Schools and universities should help break the stereotypes of "think manager-think male." This implies motivating women to access leadership positions and to challenge gender stereotypes that might constitute a barrier to their appointment as executive directors.

Finally, female managers are continuously climbing to senior positions; therefore, this study makes a contribution to a relevant contemporary topic in corporate finance. Further research on female representation in corporate directorship would benefit both the firms and their various stakeholders.

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Appendices

Appendix A: Variables Definition

Variable	Definition
CEO	A dummy variable that takes the value 1 when the CEO is a woman, 0 otherwise
CEO/CFO	A dummy variable that takes the value 1 when the CEO or the CFO is a woman and 0 otherwise
CFO	A dummy variable that takes the value 1 when the CFO is a woman and 0 otherwise
Executives	A dummy variable that takes the value 1 when the CFO is a woman and 0 otherwise
Non-Executives	A dummy variable that takes the value 1 when there is at least one woman non-executive director on board and 0 otherwise
3Non-Executives	A dummy variable that takes the value 1 when there are at least three woman non-executive director on board and 0 otherwise
ROE	The net income divided by the equity
ROA	The net income divided by the total assets
OI/TA	The operating income divided by the total assets
Growth	The growth of the total assets
OIG	The yearly pecentage change in the operating income
Leverage	The total long-term debt divided by the total assets
DED	The total long-term debt divided by the sum of the total long-term debt and equity
BoardSize	The number of directors on board
FirmSize	The logarithm of the total assets of the firm
FirmAge	Years since incorporation
Tangibility	The fixed assets divided by the total assets

Appendix B: Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. CEO	1															
2. CEO/CFO	0.765	1														
3. Executives	0.426	0.536	1													
4. Non-Exec	0.075	0.098	0.176	1												
5. 3Non-Executives	0.169	0.201	0.320	0.229	1											
6. ROE	0.014	0.015	0.047	0.054	0.033	1										
7. ROA	0.011	0.019	-0.031	0.007	0.028	0.637	1									
8. OITA	-0.007	-0.015	-0.043	-0.021	0.021	0.557	0.827	1								
9. DED	-0.041	-0.010	-0.017	0.056	0.051	0.063	0.007	0.017	1							
10. DA	-0.085	-0.054	-0.018	0.005	-0.020	-0.028	0.044	0.070	0.122	1						
11. OIG	-0.024	-0.019	-0.008	0.082	0.028	0.292	0.255	0.267	0.009	-0.066	1					
12. AG	0.011	0.023	0.060	-0.102	-0.072	0.251	0.191	0.158	-0.003	-0.027	0.162	1				
13. BoardSize	-0.047	-0.037	0.035	0.254	0.275	0.006	-0.104	-0.123	0.039	-0.082	-0.016	0.024	1			
14. FirmSize	-0.031	-0.041	0.005	0.127	0.212	-0.114	-0.381	-0.394	-0.000	-0.312	-0.118	-0.034	0.525	1		
15. FirmAge	-0.111	-0.049	0.030	0.127	0.086	-0.005	-0.025	-0.011	0.075	-0.027	-0.026	-0.030	0.087	0.146	1	
16. Tangibility	0.004	-0.000	-0.027	-0.066	-0.068	-0.044	0.136	0.202	-0.079	0.251	-0.010	0.026	-0.115	-0.199	0.122	1

Appendix C: The Regression Models for Corporate Performance and Corporate Risk

Dependent Variable		Independent Variable		Control Variables
Performance				
ROE	=	Gender	+	Leverage + Growth + BoardSize + FirmSize + FirmAge + Tangibility + ε
ROA	=	Gender	+	Leverage + Growth + BoardSize + FirmSize + FirmAge + Tangibility + ε
OI/TA	=	Gender	+	Leverage + Growth + BoardSize + FirmSize + FirmAge + Tangibility + ε
Risk				
DED	=	Gender	+	OIG + Growth + BoardSize + FirmSize + FirmAge + Tangibility + ε