



A Woman's Worth: The Impact of Board Gender Diversity on Company Performance - A Cross-country Analysis.

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I hereby declare that I have read and understood the regulations governing the submission of Master of Commerce dissertations, including those relating to length and plagiarism, as contained in the rules of the University, and that this dissertation conforms to those regulations.

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Abstract

Purpose: The study aims to investigate whether female representation on corporate boards impacts company financial and non-financial performance. Existing studies show conflicting results regarding the impact that female representation on the boards of directors may have on financial and non-financial performance, namely social and environmental performance. Studies suggest that critical mass may influence the impact that a woman on the board may have on company performance. Existing studies have observed behavioural changes in female directors when there are three or more women on the board compared to when there are less than three women on the board. The study will explore the effects of critical mass on the impact of board female representation on firm performance. Furthermore, studies posit that single-country studies contribute to conflicting results due to the influence of country-level factors. Country-level factors (including cultural norms, gender parity in terms of educational attainment, economic employment and opportunity) may influence the level of impact that female representation on the boards of directors have on company performance. Thus, this study explores whether country-level factors influence the impact of board female representation on company performance.

Design: Using a linear mixed regression, an analysis of female representation (as measured by the percentage of women on the board and critical mass) of the top 100 listed companies from Australia, Japan and South Africa between financial and non-financial performance during 2016 to 2018 is performed. Both accounting and market measures are used to determine a holistic measure of financial performance. Non-financial performance is measured using a social and environmental performance score. To determine the influence of country level factors, interaction terms are used to compare the level of impact that female representation on the boards of directors have on company performance between Australia, Japan and South Africa. In addition, an analysis of the mean female representation by country is conducted to understand the existing level of female representation per country.

Findings: The descriptive statistics show that female representation was highest in Australia with an average of 29% over the three-year period; South Africa was at 22% and Japan at only 7%, demonstrating that each country in the study has varying levels of female representation on the boards of directors. The regression results show that

female representation on boards of directors, as measured by the percentage of women on the board, is shown to have a positive and significant relationship with accounting performance, market performance and social performance. Critical mass of female representation on corporate boards is shown to positively and significantly influence financial performance but has little impact on non-financial performance. Conversely, country-level factors do not significantly influence the level of impact of female representation on performance measures. However, the descriptive statistics suggest that country-level factors are shown to influence the number of women on the boards of directors.

Originality and Value: This study is relevant to shareholders and stakeholders when considering board composition and the value of gender diversity on corporate boards for both financial and non-financial performance. In addition, this study aids the understanding of the current status of female representation on boards of directors. The study adds to the existing body of research by exploring the influence of critical mass and country-level factors on the impact of board gender diversity on company performance. Lastly, the study is relevant to regulators and policy-makers as it highlights factors which contribute to increased female representation on corporate boards.

Keywords: gender diversity, corporate governance, performance, social performance

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Introduction

“Shareholders had been asking, ‘When are you going to have a woman?’ So they put a woman on just to say they had a woman. She had to break down brick walls to be heard. She had to work hard to get into the conversation, almost like not being there. Management was not interested in her competency. It was an old boys’ club, and no one on the board wanted a female” (Konrad, Kramer, & Erkut, 2008, p. 145).

The role of women in society and in the workplace has changed dramatically over the past century. The proportion of women in the labour force has grown considerably from about 30% in the 1950s (Catalyst, 2019) to 49% in 2018 (International Labour Organization, 2018). Although women make up almost half the labour force, only 24% of senior roles are held by women globally and only 15% of boards of directors (“the board”) worldwide are women (Catalyst, 2019; Smith & Parrotta, 2018). Furthermore, females made up less than 5% of Fortune 500 companies Chief Executive Officers (CEOs) in 2018 (Zillman, 2019).

Countries have started to introduce gender quotas for female representation on boards in the last 10 years. These quotas range from a legislated mandatory 40% of women on the board in Norway and Spain (Adams & Ferreira, 2009; Isidro & Sobral, 2015) to voluntary targets for under-represented genders in Denmark (Isidro & Sobral, 2015). Diversity in boards is shown to improve the advisory function of the board (Anderson, Reeb, Upadhyay, & Zhao, 2011) owing to a broader pool of knowledge and skills (Harrison & Klein, 2007). Studies suggest that specific attributes of women, such as their leadership style, (Nielsen & Huse, 2010), ethical values (Yasser, Al Mamun, & Ahmed, 2017), professional skills (Kim & Starks, 2016) and background (Peterson & Philpot, 2007) allow women to contribute to board diversity and, therefore, enhance decision-making (Nielsen & Huse, 2010). Although women may contribute to better quality decision-making, uncertainty exists whether these decisions result in improved profitability for the company. Literature has shown inconclusive results regarding the specific value that women add to company financial performance (Gregory-Smith, Main, & O’Reilly, 2014; Isidro & Sobral, 2015; Yang, Riepe, Moser, Pull, & Terjesen, 2019). Studies have shown that the correlation between female representation on the board and financial performance can be positive (Kılıç & Kuzey, 2016; Sanan, 2016), negative (Adams & Ferreira, 2009) or not correlated at all (Gregory-Smith et al., 2014;

Wachudi & Mboya, 2012). This study aims to answer the following question: Does the presence/inclusion of female representation on the board have an impact on company financial performance?

Limited research has been undertaken on the relationship between female representation on the board and non-financial performance. Isidro and Sobral (2015) suggest that women add value to company performance indirectly through better compliance with ethical and social standards. Social and environmental factors are becoming increasingly important for companies (Eccles & Saltzman, 2011). A small, but growing body of research has found that women impact social performance but not environmental performance (Alazzani, Hassanein, & Al-Janadi, 2017). Consequently, the study extends to a second research question: Does the presence/inclusion of female representation on the board have an impact on company non-financial performance?

Critical mass has been noted as a potential reason for the aforementioned mixed results. Women are shown to behave differently when there are more women in the boardroom, thus the lack of critical mass may influence the results seen in existing literature. Research suggests that the contribution of women is limited where they experience tokenism and stereotyping in circumstances of lower levels of female representation (Konrad et al., 2008). Companies with three or more women on the board benefit more from their female directors' contribution than those with fewer than three (Joecks, Pull, & Vetter, 2013). Few studies have incorporated critical mass into the interpretation of results, largely owing to low levels of female representation (Adams & Ferreira, 2009; Lücknerath-Rovers, 2013). This study aims to include critical mass as a measure of female representation to ascertain whether financial and non-financial performance differs between companies with and those without critical mass.

Research has further highlighted country-level factors and single-entity studies as potential causes for inconclusive results. Country-level factors such as cultural norms (Low, Roberts, & Whiting, 2015), gender parity in terms of educational attainment (Rodriguez-Kiino, 2018), economic participation and job opportunities (Terjesen, Couto, & Francisco, 2016) may influence the number of women on the board, as well as the impact that women may have on company performance (Byron & Post, 2016).

However, no research has found empirical evidence to support a conclusion of a differential impact on company performance by female representation on the board as a result of country-level factors. The research aims to address this gap in the literature by performing a cross-country comparison of countries with different cultural norms and levels of gender parity, resulting in the final research question: Do country-level factors influence the impact that female representation on the board has on company performance?

To answer the research questions, this study uses a sample of companies from Australia, South Africa and Japan over a three-year period between 2016 and 2018¹. Financial and non-financial performance measures will be regressed separately against the two independent variables, namely the percentage of women² on the board and critical mass for each company per year. For the purposes of this study, critical mass is regarded as at least three women on the board of directors, thus separate regressions are performed. Interaction terms between the categorical country variables and the independent variables are used to determine the influence of country-level factors.

The results indicate that female representation on the board (measured as the percentage of women on the board) has a statistically significant positive impact on both accounting and market measures of financial performance and non-financial social performance. Critical mass (measured as at least three women on the board) is shown to improve financial performance measures but has no bearing on improved social performance measures. This result suggests that critical mass enhances the contribution that women make towards achieving improved financial performance. However, critical mass is not an essential determinant for improved social performance. These findings support those in the reviewed literature that women add

¹ Refer to the “Sample Selection” section under the Method Chapter for the sample selection justification.

² For the purposes of this study, the heteronormative definition of gender is used. The heteronormative definition of gender as per Allen and Mendez (2018, p. 70) is defined as “cisgender, masculine presenting men and cisgender, feminine presenting women”.

to effective decision-making (Nielsen & Huse, 2010) and that their different skills (Kim & Starks, 2016), background (Peterson & Philpot, 2007) and values (Yasser et al., 2017) make a differential contribution that improves not only financial performance, but also has social impact.

The results also show that country-level factors have no statistically significant influence on the measured impact on company performance of female representation on the board of directors. However, the descriptive statistics suggest that country-level factors influence the number of women on the board. Female representation on the board of directors is higher in countries with equal educational attainment and economic participation and opportunity for women. Educational attainment for women was shown to be an important factor. However, the descriptive statistics suggest that education opportunities without economic opportunities for women to participate in the work force may limit female representation on the board of directors.

The research presents novel findings on how country-level factors influence the impact of board female representation on company performance. The research adds to the existing body of research that explores the influence of female representation on financial performance. The research further contributes to the limited research on the value that women bring to non-financial measures, such as social and environmental impact. The study assists in the understanding of the differential contribution women bring to the board and the need to increase gender diversity at a board level beyond merely meeting statutory requirements.

The remainder of this paper is structured as follows: relevant literature is reviewed and the research method is set out. These sections are followed by the presentation of both descriptive and statistical results. Lastly, a conclusion, appendices and a reference list are presented.

Literature review

The literature review starts by addressing the relevance of board diversity in a company. The review further examines gender diversity, how men and women are viewed differently, and whether men and women possess different skills pertinent to board membership. Existing literature on the impact of gender diversity on company performance is explored, including possible causes for the mixed results observed. Lastly, the current position of female representation on company boards is examined to further understand the environment which women in business are experiencing today.

Board Diversity

The separation of ownership and management was introduced in order to ensure *inter alia* firm survival (Fama & Jensen, 1983). The separate role of management is to maximise firm value for owners and stakeholders (Freeman, Wicks, & Parmar, 2004). Today, separation between ownership by shareholders and control by the board is commonly practiced by companies.

Traditionally, the main boards of directors have consisted of males with similar backgrounds (Hillman, Canella, & Harris, 2002). Research has shown that diverse expertise arises from differences in knowledge and experiences of the group (Harrison & Klein, 2007). Consequently, heterogeneity increases the pool of skills available (Eisenhardt, Kahwajy, & Bourgeois, 1998; Miliken & Martins, 1996; Nielsen & Huse, 2010).

The board's primary function is to make financial, strategic, operational (Ferreira, 2010) and sustainability decisions (Liao, Lin, & Zhang, 2018) to maximise company value. These decisions are made through 1) voting on major proposals, 2) hiring and evaluating managers, 3) monitoring managerial activities, and 4) offering expert advice to top managers (Anderson et al., 2011). Anderson et al. (2011) focused on the third and fourth of the aforementioned activities and showed that heterogeneity of the board of directors improves managerial monitoring and advising.

Decisions taken by the board are often complex. Nielsen and Huse (2010) suggests that in times of uncertainty, diverse groups perform better than homogenous groups.

In particular, women, on average, tend to perform better than men in times of uncertainty (Van Staveren, 2014). Terjesen, Couto and Francisco (2016) found that companies with complex business environments are more likely to have better gender diversity. Further, diversity at a board level enhances the board's understanding of the company's products and customer demographic as a result of the individual's experience with the company as the customer (Robinson & Dechant, 1997).

The review of existing literature examined the dynamics of group decision-making between majorities and minorities³. Minorities with dissenting views may enhance the quality of the decision-making by influencing the majority to earnestly consider their views (Asch, 1955; Levine, 2017). In theory, when there are opposing views, the group can move in three ways: 1) the majority conforms to the minority, 2) the minority conforms to the majority or 3) the group reaches a compromise (Levine, 2017). Practically, studies demonstrate that minorities are more likely to conform when there are difficult, ambiguous decisions to be made, the minorities doubt their abilities (Levine, 2017) or the minorities feel that they are alone in their view (Asch, 1955). A person with a minority view is also more likely to raise his/her opposing view if such person knows he/she has an ally or support from someone else in the group (Asch, 1955). Therefore, with the appropriate support, minorities bring diversity and opposing views to the group and thus contribute to effective decision-making (Konrad et al., 2008).

Men and women display different behaviours, possess different skill sets and have different experiences (Barber & Odean, 2001; Rodriguez-Kiino, 2018; Yasser et al., 2017). Women are also predominantly a minority on corporate boards (Lückerath-Rovers, 2013). These factors contribute to effective decision-making. Kim and Starks (2016) prove that the presence of women results in higher quality advice and enhances the board's advisory effectiveness through women's unique skill set.

³ Minorities are defined as being numerically smaller than the majority, challenge the dominant view and have relatively low power in relation to the rest of the group (Levine, 2017).

Differences in skills between men and women in relation to business have been explored through a wide body of research (Kim & Starks, 2016). Women have been shown to have more international experience and less executive experience than men (Zelechowski & Bilimoria, 2004). Women have experience outside corporate such as at universities and non-profit organisations (Sealy, Singh, & Vinnicombe, 2007; Singh, Terjesen, & Vinnicombe, 2008). Women's professional backgrounds normally differ to those of male CEOs (which tend to be similar to other male directors) (Peterson and Philpot, 2007). Kim and Starks (2016) examined the commonality and scarcity of required skills amongst existing board members and noted that four out of the five⁴ scarce skills were more likely to be possessed by women.

Reviewed studies observe that owing to different social roles, women also have higher ethical values (Kennedy & Kray, 2014; Yasser et al., 2017). Glover, Bumpus, Sharp and Munchus (2002) examined differences between men and women in relation to ethical versus economic decisions through a series of decision-based questionnaires. The participants consisted of business students with varying academic performance and work experience. The results showed that male participants were 1.5 - 2.3 times more likely than females to choose unethical actions. Eweje and Brunton (2010) performed a similar study and found that men were four times more likely than women to behave unethically. Furthermore, women were shown to have a better understanding than men of the ethical implications in a business environment. However, Valentine and Rittenburg (2007) noted that although there is no difference in ethical judgement between men and women, women expressed a stronger intention to act ethically. Contrary to this research, a more recent study found that there were no significant differences between decisions of an ethical nature between men and women. Rather, ethical behaviour can be taught and it is not necessarily innate to a particular gender (Taylor, 2013).

⁴ The five scarce areas of expertise on the board of directors identified by Kim and Starks (2016) are as follows: Research and Development, Human Resources, Risk Management, Sustainability and Political/Government. Female directors are more likely to possess the above expertise barring Human Resources.

The reviewed literature shows that board diversity influences the decision-making of the group. Men and women possess unique skills and experiences which influence how decisions are made. The next theme in this review of literature considers how in times of uncertainty, strong leadership and crisis management are imperative skills that require effective decision-making at a board level. Existing literature in the Stereotypes, Crisis Management and Leadership Styles subsection below has explored the relevance of gender, and whether men and women differ in terms of leadership and crisis management.

Stereotypes, Crisis Management and Leadership Styles

The different skills of men and women have been examined in various areas of business and the workplace. Leadership and crisis management are areas that have been noted in literature in which men and women have displayed different behaviour. Leadership and crisis management are traits relevant to the function of the board of directors and thus are of particular interest to this study. Differences in leadership and management styles have been explained historically by stereotypical views of men and women. However, some research suggests that it is because of these stereotypes that men and women behave differently.

Stereotypes

Eagly and Steffen (1984) examined the stereotypical beliefs of men and women and how these people are distributed into different social roles. Typically, women are viewed as communal⁵, and men as agentic⁶ (Eagly & Johannesen-Schmidt, 2001; Eagly & Steffen, 1984). Traditional leadership qualities are typically viewed as “masculine” qualities because they are more agentic (Bass, Avolio, & Atwater, 1996).

Historically, women would perform tasks such as looking after the children which require nurturing, love and care. These qualities then became associated with femininity. This argument was developed through observation of women performing

⁵ Communal qualities are defined as selflessness and showing concern for others (Eagly & Steffen, 1984)

⁶ Agentic qualities are defined as self-assertion, self-expansion and the desire to master (Eagly & Steffen, 1984).

these tasks. However, it is further argued that just because women perform tasks that require love and care, this does not mean women are more loving and caring. i.e. more communal, than men (Eagly & Steffen, 1984).

Early studies by Eagly and Steffen (1984) examined men and women in the workplace at different job grades, with different marital statuses, children dependencies, and whether the men and women worked by choice or out of necessity. This research was conducted in order to examine the perception of agency and community between men and women. In all cases, women were perceived as both more agentic and more communal than men except in the cases in which men and women had children. Married women with children were shown to be almost equally agentic and communal, whereas married men with children were shown to be more communal than agentic and even more communal than married women. This early study concludes that the stereotypes of men being especially agentic and women being especially communal do not always hold true.

Men and women further differ in how they deal with adversity. As children, girls tend to accept responsibility for academic failure (Rijavec & Brdar, 1997) and apply more isolation, self-blame and reflection after making a decision (Al-Bahrani, Aldhafri, Alkharusi, Kazem, & Alzubiadi, 2013; Jose & Kilburg, 2007). This behaviour is also seen in adulthood. Women tend to attribute poor performance on a task to their own incompetence, whereas men tend to attribute poor performance to bad luck – this fact accounts for the self-attribution bias observed in men (Minter, Gruppen, Napolitano, & Gauger, 2005). When making decisions, women tend to remember their thought-processes and mistakes and spend more time considering decisions, resulting in a stronger negative recall bias than men (Beyer, 1998) and better foresight into negative consequences (Hillman, 2015). Conversely, considering multiple views can be time consuming and prolong decisions resulting in inefficient decision-making (Rose, 2007). Men have been shown to make quicker decisions focused on economic gain with limited consideration for other factors (Hillman, 2015).

Crisis Management

Research suggests that women tend to be more sensitive to stressors (Al-Bahrani et al., 2013), more risk-averse (Willows & West, 2014) and to prefer secure returns over

riskier returns (Croson & Gneezy, 2009). Conversely, men tend to be less aware of stressors (Al-Bahrani et al., 2013) and prefer high-risk/high-reward strategies because these are viewed as challenges rather than threats (Cesaroni, Sentuti, & Buratti, 2015). As a result, gender-diverse corporate boards have been shown to have a lower risk 'appetite' and thus perform differently to homogenous boards (Bernile, Bhagwat, & Yonker, 2018; Yang et al., 2019).

Cesaroni et al. (2015) examined whether male and female entrepreneurs responded differently to the same crisis: namely the economic recession of 2008/9⁷. It was noted that women tend to approach business differently because their goals are different. Women are less interested in rapid expansion and financial growth and more interested in a manageable yet sizeable business that allows for work-family life balance. Cesaroni et al. (2015) showed that entrepreneurs in crisis generally deploy defensive mechanisms, such as downsizing and increasing efficiency, that guarantee the survival of the business rather than offensive strategies, such as innovation and new investments. However, women have been shown to have a higher propensity for defensive mechanisms than men. This finding further demonstrates that women are more risk averse than men. Therefore, women are more likely to implement strategies with proven histories of success.

Leadership Styles

Leadership styles can be divided into different categories depending on which aspect of leadership is being considered. For example, leadership could be democratic or autocratic, transactional or transformational. Democratic leaders allow employees to be part of the decision-making process whereas autocratic leaders give the direction and decision process to employers (Eagly & Johnson, 1990). Transactional leaders set out tasks and employees are rewarded for achieving them. Transformational leaders set out the overarching goal and develop employees in working towards the broader vision (Khan, Nawaz, & Khan, 2016). Situational leadership posits that different leadership styles may be effective in different scenarios (Khan et al., 2016)

⁷ A global economic recession caused by the deflation of the housing bubble in early 2007 (World Economic Forum, 2018b).

and that gender may influence the effectiveness of the leader (Eklund, Barry, & Grunberg, 2017).

Eagly and Johannesen-Schmidt (2001) explored different leadership styles between men and women. The study found that women tend to be more democratic and men more autocratic. Furthermore, women may tend towards more democratic styles because they encounter resistance when their authority is exercised (Ridgeway, 2001). Differences between men and women in the effectiveness of their respective leadership styles have also been explored. Women were shown to be more effective managers than men (Eagly & Johannesen-Schmidt, 2001). Consistent with the findings of Barber and Odean (2001), women are considered to be more effective than men because women have to achieve better performances to maintain leadership roles (Eagly & Johannesen-Schmidt, 2001) owing to the perception that men are more competent than women (Biernat & Fuegen, 2001). Furthermore, women may also be more effective managers because they have shown themselves to be more attentive and considerate (Eagly & Steffen, 1984). However, Eagly, Karau and Makhijan (1995) and Hoyt (2017) expand this observation by noting that both men and women are effective leaders, but men and women may be differently effective in different settings (Eagly et al., 1995). Men were shown to be more effective in male-dominated roles and settings that are congenial to men (such as the military), whereas women excelled in areas that were congenial to women. Leaders were found to be most effective when the leadership role was congruent with their gender and, by extension, their leadership style (Eagly et al., 1995; Hoyt, 2017). Differences in behaviours, communication and leadership styles between men and women are pertinent attributes in the boardroom because these qualities influence decision-making (Terjesen et al., 2016).

Conversely, Bartol and Butterfield (1976) showed that gender and leadership style are independent of each other. Pounder and Coleman (2002) found that gender is not a key factor in leadership style, but rather stereotyping of men and women leads to the perception of differences in leadership styles. Supporting this argument, Daher, Guillaume and Crawshaw (2018) suggest that it is the perception of the male subordinate group that drives the leadership style rather than the perception of the female subordinate group. Similarly, Hoyt (2017) posits that women experience more bias in male-dominated contexts. Hoyt (2017) further notes that regardless of whether

gender in leadership ought to matter, gender in leadership in fact does matter because the awareness of stereotypes and expectations of gender roles influence behaviour. Haines, Deaux and Lofaro (2016) examined whether or not the stereotypes applicable to women that existed in 1983 still existed more recently. Historically and stereotypically, men have been considered more agentic (and thus, according to the stereotype, are considered to have more leadership traits), whereas women have been considered to display more communal traits. The research study showed that these stereotypes still existed in 2016. These findings remained prevalent despite women currently occupying more leadership roles than in the past (Hoyt, 2017).

Research has shown that historically men and women have played different roles in both society and the business world and, thus, gender stereotypes have developed over time. Differences between men and women are further highlighted through the different responses of men and women in dealing with adverse situations, decision-making and leadership styles. These are significant factors in the boardroom because they have an influence on a company's performance. Research further highlights the fact that although stereotypes of men and women exist, they do not always hold true.

Board Diversity and Financial Performance

Much research has investigated the impact on firm performance of having women on a board of directors (Gordini & Rancati, 2017; Isidro & Sobral, 2015; Kakabadse et al., 2015; Sanan, 2016; Terjesen et al., 2016; Willows & van der Linde, 2016). However, the results have been inconclusive. Studies have used different time periods, countries, measures of gender diversity and different performance measures as variables which may have contributed to conflicting results.

Studies performed between 2000 and 2014 showed mixed results regarding the correlation between the presence of female directors and company performance. Some studies found a positive correlation (Lückerath-Rovers, 2013), some found a negative correlation (Adams & Ferreira, 2009) and some found no correlation at all (Gregory-Smith et al., 2014; Wachudi & Mboya, 2012).

Since 2015, research has shown consistently that women have a positive impact on financial performance in terms of accounting measures, such as Return on Equity

(ROE)⁸, Return on Assets (ROA)⁹ and Return on Sales (ROS)¹⁰ (Gordini & Rancati, 2017; Green & Homroy, 2018; Isidro & Sobral, 2015; Kılıç & Kuzey, 2016; Terjesen et al., 2016; Willows & van der Linde, 2016). However, the impact on market measures of performance still vary (Gordini & Rancati, 2017; Isidro & Sobral, 2015; Sabatier, 2015; Sanan, 2016; Terjesen et al., 2016; Willows & van der Linde, 2016; Yang et al., 2019).

Kılıç and Kuzey (2016) examined the impact of female representation on the board on company performance in terms of accounting measures in Turkey. Three different measures of gender diversity were used: 1) whether or not there were any female directors, 2) the proportion of female directors and 3) Blau's Index.¹¹ The results of this study indicated that women have a significant and positive effect on company performance as measured by ROA and ROE. This finding is consistent with results found in India (Sanan, 2016) and South Africa (Willows & van der Linde, 2016), which, in common with Turkey, are both emerging markets. Other studies explored the impact of female directors on financial performance using a sample from different countries. Terjesen et al. (2016) explored the impact of independent female directors across 47 countries and Isidro and Sobral (2015) examined 16 European countries, both using ROA as a performance measure. Both studies concluded that female representation on the board of directors has a positive impact on company performance in terms of accounting measures.

Tobin's Q¹² has been used as a market measure of performance in a number of studies (Marinova, Plantenga, & Remery, 2016; Reguera-Alvarado, de Fuentes, & Laffarga,

⁸ Return on Equity (ROE) is measure of financial performance calculated by dividing net profit over equity.

⁹ Return on Assets (ROA) is measure of financial performance calculated by dividing profit over assets.

¹⁰ Return on Sales (ROS) is measure of financial performance calculated by dividing profit over sales.

¹¹ Blau's Index is a measure of gender diversity. It is defined as the probability that two members randomly selected from a population will be in different categories if the population size is infinite (Solanas, Selvam, Navaro, & Leiva, 2012).

¹² Tobin's Q is measured as the sum of total assets and market value of equity less the book value of equity, divided by total assets (Terjesen et al., 2016)

2017; Yang et al., 2019). Market measures of performance reflect investors' perception of value of the company and future performance. Accounting measures consider past performance predominantly (Gentry & Shen, 2010; Hoskisson, Johnson, & Douglas, 1994). Both past and future performance are relevant for understanding the impact that female directors have had and will have on a company's performance. Research has shown conflicting results when examining the impact that women board members have on market measures. A number of studies showed a positive relationship between gender diversity and market performance (Reguera-Alvarado et al., 2017; Sabatier, 2015; Sanan, 2016; Terjesen et al., 2016). Conversely, studies by Willows and van der Linde (2016) and Yang et al. (2019) showed a negative correlation between gender diversity and market performance, whereas Isidro and Sobral (2015) and Marinova, Plantenga and Remery (2016) found that women have no effect on company value in terms of market measures.

Ryan and Haslam (2005) partly explain the varying correlations between board gender diversity and market measures. In some cases, five months before the appointment of the female director, companies experienced poor performance compared to the five months preceding the appointment of a male director. This phenomenon was labelled by Ryan and Haslam (2005) as a "glass cliff". A 'glass cliff' refers to the fact that women are more likely to be promoted in a company when the company is in distress or crisis (Glass & Cook, 2016). Ryan and Haslam (2016) further explored the glass cliff phenomenon through multiple experimental methods. The results of these methods showed that when participants wanted to maintain the male-dominant *status quo*, men and women with equal qualifications were equally ranked when companies performed well, but women were the preferred leaders in times of poor performance (Ryan et al., 2016).

Women are promoted to high-risk leadership positions more often than men (Ryan et al., 2016), despite literature suggesting that women tend to be more risk-averse than men (Croson & Gneezy, 2009; Jianakoplos & Bernasek, 1998; Niederle & Vesterlund, 2007). When women have been in such high-risk leadership positions, researchers found that they lacked the appropriate support from their colleagues and that their authority was questioned, resulting in shorter leadership terms than men (Glass & Cook, 2016). Eagly and Johannesen-Schmidt (2001) also noted possible reasons for

women having shorter leadership terms than men. They found that, despite poor performance, men have remained in leadership positions because of their more detached leadership style. This type of leadership may allow men to distance themselves from responsibilities that resulted in poor performance. This behaviour is consistent with men displaying a self-attribution bias (Minter et al., 2005) and women having a stronger negative recall bias (Beyer, 1998), an attribute which may make women feel more responsible for poor performance, and result in their being targeted as scapegoats.

Lückerath-Rovers (2013) notes that because the board makes strategic decisions to maximise company value, company performance as a result of changes in the board cannot be measured on a short-term basis. Research remains inconclusive regarding the impact of female board representation on financial performance (particularly when the results vary depending on the time frame and the measure of financial performance used). In addition, existing studies have primarily focused on one type of performance, namely financial performance. However, non-financial performance, such as governance, social and environmental factors, should also be explored to understand the full impact of women board members on company performance.

Board Diversity and Non-financial Performance

In the past decade, companies have also shifted their focus beyond the 'bottom line'. After the economic recession of 2008/9, stakeholders and regulators called for more transparency, accountability and better governance (Ben-Amar & McIlkenny, 2015; Reguera-Alvarado et al., 2017; Singh et al., 2008). Companies are now reporting on financial targets as well as social and environmental targets (Eccles & Saltzman, 2011). In September 2015, the 2030 Agenda for Sustainable Development was adopted by world leaders. The 2030 Agenda for Sustainable Development includes seventeen sustainability goals and relies on government, private sector and civil society in order to achieve these (United Nations, 2016). In October 2016, the Global Reporting Initiative (GRI) launched the first global standards for sustainability. These are voluntary disclosure standards for companies to report on their environmental and social impact (Global Reporting Initiative, 2016) highlighting the importance of sustainability and social measures.

Harjoto, Laksmana and Lee (2015) examined the relationship between Corporate Social Responsibility (CSR) performance and board diversity. The study focussed on seven measures of diversity, one of which was gender. The results show that gender-diverse boards perform better in relation to CSR activities and better manage the needs of various stakeholders. Alazzani et al. (2017) performed a similar study in Malaysia examining gender diversity and social and environmental performances. Social and environmental performances were measured on the basis on twelve disclosure items¹³ in the integrated report and whether these measures were met. Female directors were found to have a positive influence on social performance but there was no demonstrable correlation between gender diversity and environmental performance (Alazzani et al., 2017). Similarly, Hoyt (2017) posits that women tend to place greater emphasis on social issues than men, owing to differences in their value systems, since women tend to focus more on the well-being of others. Nielsen and Huse (2010) suggest that the leadership style of women, combined with women's attention and consideration for others, may lead to women being particularly sensitive towards CSR decisions.

Nadeem et al. (2017) investigated the impact of gender diverse boards in relation to corporate sustainability practices of listed Australian companies between 2010 and 2014. CSR was measured using the Bloomberg sustainability Environmental, Social and Governance (ESG) score which is a measurement of disclosure based on the GRI standards. Men and women were shown to differ in their sustainability values. Furthermore, the presence of women on a board positively influenced corporate sustainability. Yasser et al. (2017) explored the impact of female directors on CSR in three emerging markets (Malaysia, Pakistan and Thailand) and the results of these studies were consistent in showing that female directors improve CSR performance.

¹³ The twelve disclosure items noted in Alazzani et al. (2017) consisted of social and environmental factors. Social factors included community volunteering initiatives by employees, community investment projects, donations to non-profit organisations and providing education and training to employees. Environmental factors included the company reducing carbon dioxide emissions, reducing the company's impact on climate change and pollution, and recycling and waste reduction projects.

The influence of women extends beyond environmental and social matters. Women have also been shown to influence corporate governance, attendance and staff behaviour (Adams & Ferreira, 2009; Dunn, 2012; Konrad et al., 2008; Terjesen et al., 2016). Adams and Ferreira (2009) found that women contributed to better corporate governance and are more likely to hold executives accountable for company performance. This finding is consistent with that of Anderson et al. (2011) who noted that board diversity increases the monitoring of managerial activities. Also, women have been shown to influence positively the behaviour of men on the board. Women tend to have better attendance records than men and, thus, men have better attendance records when women are on the board. As such, women not only hold management personnel more accountable for their performance, but they also enhance board performance by improving attendance and facilitating decision-making (Adams & Ferreira, 2009).

Women are also shown to have an influence on employees. Female directors tend to be more appreciative and understanding of their employees. As a result of this display of empathy, employees view female directors as more approachable and thus felt able to be more open with the board (Konrad et al., 2008). A number of other studies have shown that female directors attract and retain female employees at lower levels because their presence on the board sends a positive signal for promotion within the company (Dunn, 2012; Terjesen et al., 2016). Furlotti, Mazza, Tibiletti and Triani (2019) showed that female board members are likely to implement gender diversity policies. The nub of the reviewed literature on this theme is that women have been shown to have a positive impact on non-financial performance such as CSR, sustainability, behaviour in the boardroom and staff morale.

The small, but growing body of literature, as mentioned in this subsection, suggests that having women as board members promotes CSR performance as well as influencing the effectiveness and behaviour of fellow board members. Limited quantitative studies with varying measures of non-financial performance have been used in the existing literature to measure the impact of female representation on the board. This study aims to use a comparable, quantifiable method to measure the impact of female representation on the board on both financial and non-financial

performance across multiple countries to add to the growing body of research in this field.

Time, Endogeneity and Critical Mass

Lückerath-Rovers (2013) highlighted three issues which could cause varying results in the correlation of female representation on the board with company performance. The issues noted were: 1) time, 2) endogeneity and 3) critical mass. Studies on the impact of board female representation on company performance have been performed at different times, and over different periods and it was noted that shorter periods may not give the same results when compared to longer periods because strategic decisions may take longer to implement (Lückerath-Rovers, 2013). The second issue of causality poses two questions: Are companies performing better or worse because of having women on the board, or are better- or poorer-performing companies hiring more women? Are there other variables that are correlated with both female representation and company performance which have been excluded from the model? Lastly, critical mass focuses on the number of women on the board and whether the number of women on the board influences the level of impact that they (or, if only one woman, she) may have.

Time

The time period of a study can be explained either over the years the study took place, or the length of the study being the number of years used in the study. As is seen in the literature review, both factors can cause varying results between the impact of female representation on the board and company performance.

As mentioned earlier, the economic recession of 2008/9 saw stakeholders call for better corporate governance practices (Ben-Amar & McIlkenny, 2015; Reguera-Alvarado et al., 2017; Singh et al., 2008). Gender diversity on the board is considered to be a good corporate governance practice (Institute of Directors of South Africa, 2009). Prior to the economic recession, seven countries had either legislated gender quotas or recommended governance practices, whereas post-recession, this number grew to 25 countries by 2015 (Terjesen, Aguilera, & Lorenz, 2015). A number of studies have used data in the period prior to the economic recession of 2008/9 (Adams & Ferreira, 2009; Lückerath-Rovers, 2013; Marinova et al., 2016), time periods over

the economic recession between 2008 and 2012 (Kılıç & Kuzey, 2016; Sabatier, 2015; Sanan, 2016) and periods post-recession between 2010 and 2015 (Nadeem et al., 2017; Sanan, 2016; Willows & van der Linde, 2016). The time period used in the studies may influence measures of profitability (during and outside the recession period) and the level of female representation on the board (prior and post-recession period), and thus may contribute to mixed results.

Time period lengths commonly used in existing studies range from a single year (Alazzani et al., 2017; Marinova et al., 2016; Willows & van der Linde, 2016), three years (Isidro & Sobral, 2015; Lückerath-Rovers, 2012) and five years (Gordini & Rancati, 2017; Sabatier, 2015) which may contribute to the varying results acquired for the impact of female representation on the company's board on financial performance. Ryan and Haslam (2005) suggests the financial performance of a company shortly after a board appointment is more likely to be indicative of shareholder confidence in the director's appointment rather than the impact of the board member him/herself. Legislative measures that promote board gender diversity generally include quotas (33%-50% female representation on the board) and time periods (3 – 5 years) (Terjesen et al., 2015). The average board tenure for women was reduced from five years in 2015 to four years in 2016 (Kukomnik, 2017). Thus, studies with shorter periods may not sufficiently incorporate the impact that female representation on the company's board may have on long-term strategic decisions (Lückerath-Rovers, 2013).

Time periods during which the studies took place and the length of the study provides a possible explanation for the disparate results. Shorter periods omit the effects of long-term projects and decisions made by the board, and thus longer periods are required to fully understand the impact on company performance of female representation on the board. Economic conditions, such as the economic recession of 2008/9, not only impacts company performance but also serves as a catalyst for change in governance practices. More recent studies are needed to better reflect the existing impact on company performance of female representation on the board.

Endogeneity

Endogeneity arises in two forms. The first is when there is a correlation between the independent variable and the error term in the model (Cameron & Trivedi, 2009). Stated differently, there is endogeneity in a model when a variable that is correlated with the dependent variable and independent variable has been omitted from the model. Secondly, reverse causality may lead to the dependent variable having an impact on the independent variable rather than vice versa (Sila, Gonzalez, & Hagendorff, 2016).

A number of studies have raised the concern of endogeneity in the context of female representation on the board and company performance (Adams & Ferreira, 2009; Joecks et al., 2013; Lückerath-Rovers, 2013; Nadeem et al., 2017; Ntim, 2013; Sabatier, 2015; Yang et al., 2019). There are disputes as to whether companies perform well because of gender diversity in the boardroom, or whether high-performance firms are more likely to hire female directors. Kakabadse et al. (2015) expanded the observation made by Baysinger and Butler (1985) that in order to appear progressive, top-performing companies may hire a female or females and appoint them to the board. Similarly, Ryan and Haslam (2005) noted that a woman is more likely to be promoted in times of poor performance, thus, further contributing to the concern regarding causality.

Sila et al. (2016) suggest that the issue of reverse causality is dynamic: current female representation is influenced by past company decisions and performance. To explore if endogeneity exists based on past performance, Sila et al. (2016) conducted a Probit test. The objective of the Probit test is to determine whether past risk influences the company's appointment of new female directors. The results of the Probit test showed that the probability of past risk impacting female representation on the board (i.e. the effects of reverse causality) is small and only suggestive of endogeneity. Using the same method, Lu and Herremans (2019) tested whether past environmental performance influences the probability of appointing a new female director. The results of this study showed that past environmental performance has no impact on the appointment of female directors. Thus, although dynamic endogeneity may exist, the impact on the appointment of female directors is shown to be small.

Several studies have controlled for endogeneity (Nadeem et al., 2017; Ntim, 2013; Sabatier, 2015) and still found a positive relationship between board gender diversity and company performance. However, a Norwegian study found a negative relationship between gender diversity and company performance after controlling for endogeneity (Yang et al., 2019). Thus, the literature reviewed is inconclusive regarding causality between gender diversity on the board and company performance.

Critical Mass

Critical mass and female representation have been widely explored in existing literature. The topic was introduced as early as 1998 when Dolan and Ford (1998) noted that women act more distinctively once a certain threshold has been reached. Thus, the topic of critical mass is relevant when assessing the impact of women on company performance because it may influence the behaviour of the women on the board.

A large number of studies measured gender diversity with a binary variable; whether there was at least one female director or no female directors (Alazzani et al., 2017; Green & Homroy, 2018; Kiliç & Kuzey, 2016; Marinova et al., 2016; Nadeem et al., 2017; Wachudi & Mboya, 2012) because most companies were found to only have one female director (Adams & Ferreira, 2009; Lückerath-Rovers, 2013). However, some studies suggest that greater value is added to company performance when there is more than one woman on the board.

Konrad et al. (2008) interviewed 50 female directors from Fortune 1000 companies as well as a number of their male counterparts. Based on these interviews regarding board dynamics, the presence of only one woman on a board was considered to be a token. Consequently, her opinions were largely ignored, her views were perceived as stereotypical and representative of all women, and not based on the female director's individual skills and observations. The perception of female representation in the boardroom was that it is a superficial act to please shareholders who called for gender diversity. Women who wanted to be taken seriously had to fight for their voices to be heard. Kakabadse et al. (2015) confirmed that participants who were the only woman on their company's board felt that their contribution was limited.

The presence of two women on a board increased the feelings of inclusion but the effects of tokenism and the stereotypical perception of women were merely reduced but not eliminated. Three women in the boardroom removed the barriers that were experienced by just one or two women (Konrad et al., 2008). With three women in the boardroom, women were accepted, were more active in the discussion and were more likely to be heard. It becomes harder for men to stereotype the views of women when each of the women present different opinions from one another (Konrad et al., 2008). The presence of more women on a board created a more comfortable space for female directors to voice their views because it becomes more difficult for men to ignore a larger proportion of the board (Kakabadse et al., 2015). The presence of three women made a significant contribution to boardroom effectiveness and collaboration (Konrad et al., 2008). Konrad et al. (2008) and Torchia, Calabrò and Huse (2011) concluded that one woman is enough to make a difference, but companies with at least three women on the board benefit the most from their contribution.

Few studies have explored the impact of critical mass on company performance. Some studies examined whether a board had 30% or more female directors (Isidro & Sobral, 2015; Joecks et al., 2013) whereas others examined whether there were three or more female directors (Sabatier, 2015; Willows & van der Linde, 2016). When using the proportion of 30% female directors to examine the impact of critical mass in relation to firm performance, there were mixed results. Either there was no correlation (Isidro & Sobral, 2015) or a positive relationship to firm performance (Joecks et al., 2013). Joecks et al. (2013) further noted that 30% of the female directors approximated three female directors. When using the absolute number of three or more female directors, there was a stronger positive relationship with firm performance in terms of accounting measures (Joecks et al., 2013; Willows & van der Linde, 2016) and a weaker negative relationship with market measures (Willows & van der Linde, 2016). Sabatier (2015) found no indication of tokenism when companies in the sample had three or more female directors.

Thus, research has shown that critical mass is a relevant consideration when seeking to understand the impact of women on company performance. Existing studies have incorporated different measurements for critical mass, however, a large body of research has concluded that three female directors appear indicative of critical mass.

Time, causality and critical mass are all relevant factors when considering the impact of female representation. Research suggests that the time period and the length of the study may contribute to the mixed results. Further, research has shown to be inconclusive regarding causality. Conversely, research suggests that three women is an appropriate threshold for critical mass when observing the impact on company performance of the presence of women on the board. Research has further highlighted factors that may accelerate or hinder companies from reaching critical mass. These factors have shown to be driven by the social culture and regulatory environment of the country in which the company is situated.

Quotas, Culture and Country Variables

Cultural norms and societal expectations in different countries have been shown to influence the impact on the company performance of women on the board (Kakabadse et al., 2015; Low et al., 2015). The literature shows that factors such as workforce participation (Terjesen et al., 2016), the institutional environment (Terjesen & Singh, 2008) and gender quotas (Yang et al., 2019) influence the number of female directors and their impact on company performance.

Kakabadse et al. (2015) explored the impact of gender diversity on the board across three countries (United Kingdom, United States of America and Ghana) on the basis that each country had different gender-related development scores. The researcher interviewed ten female directors from each country to explore the impact of women on the board. However, the aim of the study was not to draw comparisons between the countries but rather to include a diverse sample. Terjesen et al. (2016) explored the relationship between gender diversity and firm performance across 47 countries, including a range of developed and developing markets for a diverse sample. Control variables were used to account for these differences between markets because developed markets may have more advanced corporate governance practices; however, no comparisons between countries were drawn. Thus, little to no research has presented a cross-country comparison. Existing literature using multiple countries for sample diversity rather than for comparative analysis, highlighted a gap in the literature.

Byron and Post (2016) posit that the reason for the previously noted varying results of the impact on company performance of female representation on the board is that the studies are based on a single country and, thus, country-level factors influence the extent that their presence may have on company performance. Macro-environmental factors that influence the relationship between governance and performance can only be explained through cross-country studies. Post and Byron (2015) and Byron and Post (2016) used a meta-analysis to explore the influence of country-level factors (in the form of shareholder protections¹⁴ and gender parity) on the correlation between female board members and company performance. The results showed that there was no relationship between shareholder protection and gender parity on the impact of female board members on financial performance. Conversely, a stronger positive relationship was observed between women on the board and CSR performance in countries with higher shareholder protections and higher gender parity.

Although research has identified that country factors may influence the impact on company performance of female representation on the board, very few of the studies in the reviewed literature have explored a cross-country comparison to evaluate the country-level impact that may contribute to the conflicting results noted in the previous paragraph. Thus, this study aims to address the gap in the literature by performing a cross-country comparison, using quantitative methods, to explore the impact of female board members on the company's financial and non-financial performance.

Nonetheless, a number of studies have examined the relationship between women in the workforce and cultural norms. Rodriguez-Kiino (2018) explored the experiences of sixteen women in the Japanese workforce. The study highlighted these women as having experienced barriers and familial discouragement to pursue higher education. The expectation of the majority of Japanese women is to maintain the household and provide childcare rather than participate in the workforce (Low et al., 2015; Rodriguez-Kiino, 2018). Mukherjee (2015) showed that despite the increase in education, there was still a lack of participation by women in the Chinese, Japanese and Indian labour force owing to the gender norms practised in these countries. This lack of female

¹⁴ Shareholder protections include the transparency of related party investments, liability for directors for breach of fiduciary duties and the ease at which shareholders can hold directors liable for misconduct (Byron & Post, 2016).

participation in the workforce is not unique to the South and East Asian markets. Khoudja and Platt (2018) explored the entries and exits of women of different ethnicities to and from the labour force in the United Kingdom. Participation varied between ethnicities and highlights that even within the same labour market, cultural differences influence the participation of women in the workforce.

Although an increase in education in some nations may not translate into female participation in the labour force, this is not the case for all nations. Heath and Jayachandran (2018) examined the relationship between female education and work force participation in developing nations. The study showed that gender parity in terms of the education of women in less developed nations is lower than that of developed nations. However, the study further showed that as these developing nations start to grow, education for both genders increases, but female education rises faster than male education (and thus starts to move towards equal education for men and women). The study further demonstrates that an increase in female education results in an increase in female participation. However, like Mukherjee (2015), Heath and Jayachandran (2018) note that not all developing nations, for example Pakistan and Malawi, experience the positive correlation between education and workforce participation.

Some countries have introduced quotas to increase the participation of women in the workforce. Gender quotas are mechanisms imposed on companies predominantly to meet a particular level of female representation. Terjesen, Aguilera and Lorenz (2015) examined the driving factors behind gender quotas on a board. Countries with a history of gender inequality, structures to promote gender equality in the workplace and left-wing political participation were more likely to have gender quotas for boards. Ten countries have legislated mandatory gender quotas and fifteen have corporate governance codes that promote gender diversity at a board level (Terjesen et al., 2015). Countries with the highest level of board gender diversity such as Norway (42%), Sweden (28%) and Finland (27.2%) all have mandatory gender quotas. Conversely, countries with lower gender diversity levels such as Morocco (0%), Japan (0.9%) and Chile (2.4%) do not have any policies to promote gender diversity (Terjesen et al., 2015). These figures suggest that gender quotas are effective in achieving gender parity on the board of directors.

Although gender quotas are used to promote gender equality in the workforce, gender quotas are not always received positively. Quotas are viewed as delegitimising the merits of the female directors and limiting the board's ability to choose directors based on the skills required (Adriaanse, 2017; Kakabadse et al., 2015). Some research suggests that resistance towards gender quotas originates from the desire to reduce the participation of women in leadership positions (Forstenlechner, Lettice, & Özbilgin, 2012; Sayce & Özbilgin, 2014). Despite the varying views on gender quotas, they are shown to be an effective method for increasing gender diversity over time (Adriaanse, 2017; Grosvold, Brammer, & Rayton, 2007; Yang et al., 2019).

Consequently, there are a number of varying factors highlighted in this subsection that need to be considered when understanding women's participation in the workforce and the challenges that women face to gain access to senior levels of management. Challenges range from societal expectations and unpaid obligations to stigmas around the use of quotas. Access by women to education continues to be a focus to increase workforce participation, however, cultural barriers persist. Thus, differences exist between nations in terms of gender parity in the workforce and these differences influence the availability of women who are eligible to be on the board of directors.

Current Position of Women on the Board

Although female representation on boards is increasing, women remain under-represented. The percentage of women on the board has increased globally from 15.8% in 2016 to 17.3% in 2017 (Catalyst, 2018). Farrell and Hersch (2005) showed that if a woman resigned or retired from a board, the likelihood of the appointment of another woman to replace her is 39%. However, if a man resigned, the likelihood of appointing a woman was only 13%. These statistics contribute to the delayed progress to reach gender diversity targets. Catalyst (2018) revealed that if there is a female chairman, the board has twice as many female directors as those with a male chairman. Female directors are more likely to implement and support initiatives to promote women in the workplace (Konrad et al., 2008) and create a female-friendly environment (Gagliarducci & Paserman, 2014).

Women continue to hold more non-executive positions than executive positions (Broadbent, 2016; Lückerath-Rovers, 2013). Lückerath-Rovers's (2013) study showed that although females made up 5% of all directors on the board, females made up 2.1% of all executive directors and 6.9% of non-executive directors for 99 listed Dutch companies. Willows and van der Linde (2016) noted that for 40 South African companies, 18.78% of directors were women and 90% of these women were non-executive directors.

The tendency to hire women for non-executive positions could possibly be explained by the function and structure of board committees as well as the unique skills of women. Board committees are structures created to perform specific tasks on behalf of the board (Guo & Masulis, 2015) such as monitoring risk, remuneration and board appointments. Board committee members should have the necessary skills to perform the function of that committee. These committees may also have different composition requirements as between executive and non-executive directors to ensure the appropriate level of corporate governance (Institute of Directors of South Africa, 2009). Adams and Ferreira (2009) found that women are more likely to be appointed to monitoring committees rather than remuneration committees. Boards with more women have shown to outperform male-dominated boards in relation to audit, risk and oversight (Brown, Brown, & Anastasopoulos, 2002), suggesting that women possess the necessary skills to serve on monitoring committees. The audit and risk committees should consist largely of independent non-executive directors (Institute of Directors of South Africa, 2009) and this requirement could explain why women are mostly appointed as non-executive directors.

Kang, Ding and Charoenwong (2010) demonstrated that the market reaction to the appointment of a female director is generally positive. However, the market reaction is less positive when a woman is appointed to an executive position. Lee and James (2007) posit that female CEOs are more likely to be adversely affected by detrimental gender stereotypes and perception biases. Further, the under-representation of women in executive positions reinforces the stereotypes that men are more qualified for executive roles. Careful consideration of the potential risks associated with executive female appointments is necessary, and succession planning and communication need to be in place to offset the anticipated market reaction (Lee &

James, 2007). Thus, the adverse market reactions and stereotypical labelling faced by women may limit the number of women appointed to executive positions.

Representation of women is also shown to be concentrated in certain industries. Women are largely appointed in Consumer Goods or Financial Services rather than Industrial and Basic Materials (Adams & Ferreira, 2009; Grosvold et al., 2007; Joecks et al., 2013). The industry sector has been shown to influence the gender composition of the board; historically, male-dominated sectors have been demonstrated to have the lowest level of female representation on the board (Grosvold et al., 2007; Skaggs, Stainback, & Duncan, 2012). Similarly, the findings of Brammer et al. (2009) prove that women prefer sectors that interact with the final/female consumer rather than sectors that are male-dominated, such as construction and engineering. This fact may be linked to the stereotypes that women face in leadership positions (Hoyt, 2017) which drives them to choose sectors that are less male-dominated. Skaggs et al. (2012) posit that until women occupy both managerial and non-managerial positions in under-represented industries, board opportunities for women in these industries remain scarce.

Currently, women still remain under-represented on the board of directors of the majority of companies. Women are shown mostly to occupy non-executive positions and female representation tends to be concentrated to certain sectors. Male-dominant sectors tend to have a lower representation of women on the board compared to other sectors. Women's presence on the board is likely to promote the advancement of women in the workplace and, thus, companies should continue to work towards achieving gender diversity on their boards.

Conclusion

Research delineated in the literature review has highlighted the importance of gender diversity on decision-making and the influence that women have on various aspects of a company. However, these research results are inconclusive as to whether women have a causal impact on company performance. The variation in results is owing to factors such as the time period, cultural norms and stereotypes, critical mass, gender quotas and the economic participation of women that have impacted such research projects. This study aims to shed light on the gaps identified in the literature review by

performing a multi-country study with a cross-country comparison of the impact that women board members have on both the company's financial and non-financial performance.

Method

Objective

The literature review delineated in the previous chapter showed that, while several studies have explored the impact of gender diversity on company performance, the results are mixed. The studies were focused largely on financial performance in a single country. Those studies that considered multiple countries focused on the European region. Gender parity, economic participation and education across different countries were factors contributing to the mixed results. Furthermore, limited research assessed the impact of gender diversity on non-financial performance, such as a company's contribution to society, the environment and the implementation of sustainable business practices. Consequently, the objective of this research is to explore a cross-country comparison of the impact of gender diversity in the board of directors on companies' financial and non-financial performance. The three countries selected for the cross-company comparison have different economic markets, cultural norms, as well as potential for female educational attainment, economic participation and opportunity. Further justification for the selection of these countries is included under the "Sample Selection" section further below.

The research questions posed in this study are as follows:

1. Do women on a company's board of directors positively impact the company's financial performance in terms of accounting and/or market measures?
2. Do women on a company's board of directors positively impact non-financial performance in terms of environmental and social impact?
3. Does the impact of women on the board on a company's financial and non-financial performance vary in countries with different economic environments, gender parity and cultural norms?

The null hypotheses (H_0) are that female representation has no positive impact on a company's financial position (measured in terms of accounting or market measures), social and environmental performance, and that country-level factors have no influence on the impact that women on the board have on a company's performance. The alternative hypotheses (H_1) are that female representation positively impacts a company's financial, social and environmental performance and that the country-level

factors do influence the impact that women on the board have on company performance.

In order to answer the above research questions, female representation (as measured by the percentage of women on the board and critical mass being three women¹⁵) will be assessed against the ROA, ROE and Tobin's Q for financial performance of the company. Female representation will also be assessed against the company's environmental and social performance (as measured by the environmental and social pillar score determined by Refinitiv¹⁶). Interaction terms between the percentage of women on the board and critical mass with a country variable, will be created and evaluated to determine the influence of country-level factors on the impact of women board members on company performance.

Research Data

Sample Selection

The countries selected for the cross-country comparison are Australia, Japan and South Africa. These countries were selected because each country has different economic and cultural landscapes (World Economic Situation and Prospects, 2014), regulated gender quotas (Terjesen et al., 2015) and levels of gender parity (World Economic Forum, 2018a). Further, these countries permit the use of International Financial Reporting Standards (IFRS) for listed companies (The IFRS Foundation, 2017) and provide annual reports in English. Uniform reporting standards are necessary to ensure a consistent measure of accounting performance because accounting treatments and presentation of financial results may differ between standards.

The Global Gender Gap Report (GGGR) was used to select the three countries for comparison. This method is similar to the approach used by Kakabadse et al. (2015) to examine countries that had varying levels of gender inequality as per the Gender

¹⁵ The justification for using three women as critical mass is included under the "Independent Variables" section below.

¹⁶ Refinitiv (previously Thomson Reuters), is a financial information provider (Thomson Reuters, 2013).

Related Development Index. The GGGR measures four areas of gender inequality across 149 countries: 1) Economic Participation and Opportunity, 2) Educational Attainment, 3) Health and Survival and 4) Political Empowerment. For the purpose of this study, two of the categories, namely Economic Participation and Opportunity, and Educational Attainment, were most appropriate. These areas are relevant to the outcome of female representation at a board level. The categories of Economic Participation and Opportunity reflects the ratio of women in the labour force, the remuneration gap between men and women, the ratio of men and women in management and the ratio of female professional workers. The second measure, Educational Attainment, measures the access to education and literacy rates of women compared to men. Board members are required to possess the necessary skills to fulfil their role. These skills include knowledge of the specific industry, technical and specialist knowledge in their area of expertise and an understanding of governance practices (Australian Institute of Company Directors, 2017). In order to obtain these skills, board members need to have sufficient education and work experience to qualify for a position as a director, thus making Educational Attainment and Economic Participation, and Opportunity the most relevant categories.

The GGGR allocates a score to each country based on the criteria within each category. These scores range between 0 and 1, with 1 being the highest attainable score. The countries are then ranked from 1 to 149 depending on their score for each category. The most recent GGGR figures available are for 2018.

Between Australia, Japan and South Africa, Australia is ranked the highest with a rank of 1 (score of 1) for Educational Attainment and 46 (score of 0.718) for Economic Participation and Opportunity. South Africa falls somewhere in the middle, with a rank of 72 (score of 0.992) for Educational Attainment and 91 for Economic Participation and Opportunity (score of 0.645). Japan is ranked very low for Economic Participation and Opportunity with a rank of 117 (score of 0.595). However, Japan is ranked closer to the median for Educational Attainment with a rank of 65 (score of 0.994).

In addition to gender parity, differences in economic environments have also been noted between these three countries. Australia and Japan are developed markets, whereas South Africa is an emerging market (World Economic Situation and

Prospects, 2014). Both Australia and South Africa have recommended gender quotas for a company's board of directors, whereas Japan does not (Terjesen et al., 2015). Thus, a cross-country analysis between these three countries is appropriate for the objectives of this research study.

The top 100 companies listed on the Johannesburg Stock Exchange (JSE), the Australian Stock Exchange (ASX), and the Tokyo Stock Exchange (TSE), as at 31 December 2018, were selected. The necessary information was then obtained for these 300 companies (the sample companies) for the three years from 2016 and 2018 (the sample period). A period of three years was used due to limited ESG data in earlier years and in order to assess the most recent financial data. The average board tenure for women was four years in 2016 (Kukomnik, 2017) and quota periods for women generally range between three and five years (Terjesen et al., 2015). Thus, a three-year period is considered sufficient to assess the short and long-term impact of female representation on the company's board on company performance during recent years.

Variable Data

Financial information such as ROE, ROA, Tobin's Q, Total Assets and Leverage was obtained from Bloomberg¹⁷. All information was captured in US Dollars (USD) for comparability across different reporting currencies. Three reporting frameworks are used amongst the 300 sample companies: IFRS, US GAAP¹⁸ and Japanese GAAP (JP GAAP). IFRS is used in South Africa and Australia. Two Australian companies have chosen to report in US GAAP as they are dual-listed in the United States. Japanese companies have the option of using any one of the three financial reporting frameworks. Of the Japanese companies, 41% of the sample use IFRS, 12% use US GAAP and 47% used Japanese GAAP. Thus, a control variable will be used in the testing to control for differences in reporting frameworks. Non-financial information, such as the Refinitiv Environmental and Social scores, were obtained from Datastream¹⁹.

¹⁷ Bloomberg is a technology provider of financial data, news and information (Bloomberg, 2019).

¹⁸ GAAP stands for Generally Accepted Accounting Principles.

¹⁹ Datastream is a financial and macroeconomic data platform (Thomson Reuters, 2013).

Board composition information was collected from Bloomberg (2019) and individual company annual reports. Random spot checks were performed on the information obtained from Bloomberg and the annual reports to ensure consistency. Where any differences were noted, only the information from the annual report was used for that instance. Limited differences were noted between Bloomberg (2019) and the individual companies' annual report.

The company sectors were determined using the Industry Classification Benchmark (ICB) and the industry sector coding obtained from Bloomberg. The sectors were simplified into the following three sectors: Financials, Industrials and Resources (The Johannesburg Stock Exchange, 2018).

Data cleaning

The initial sample of 300 companies was reduced by two companies that were dual-listed on the ASX and the JSE to avoid double-counting these companies. The sample was further reduced by companies that had missing information, non-recurring items²⁰ or information that could not be relied upon owing to restatements of the financial statements in any year for the sampled period. The final sample comprises 294 companies over three years resulting in 863²¹ individual data points. Appendix A includes a list of these 294 companies.

²⁰ Non-recurring items refers to any once-off transactions that occurred during the year which are not related to normal business (Li, Su, Dong, & Zhu, 2018). For the sample selected, these transactions include, *inter alia*, profits from a discontinued operation and profits that arise from a deemed sale of an associate which became a subsidiary during the year.

²¹ Companies with either missing information, non-recurring items or information that cannot be relied on due to restatements were excluded only for the year in which those anomalies were noted i.e.: a company may be included in the sample for the 2016 and 2017 years but not 2018.

Variables

Dependent Variables

The most common measures of financial performance noted in the literature review were ROA, ROE and Tobin's Q (Adams & Ferreira, 2009; Isidro & Sobral, 2015; Kılıç & Kuzey, 2016; Sabatier, 2015; Sanan, 2016; Willows & van der Linde, 2016). The former two measures are accounting measures and the latter is a market measure. These same three measures of financial performance were chosen for consistency and comparability to previous studies and, thus, their ability to reliably measure company performance.

Although ROA and ROE are both accounting measures of profitability, each ratio measures a different aspect of performance. ROE measures the profit or return a company makes for its shareholders. ROA measures how efficiently a company is using its asset base to generate profit (Correia, 2019). The main difference between the two measures is leverage. The more financially leveraged a company is, the more funds it has to acquire assets without using shareholder funds. Profits generated from debt-funded assets may result in a higher ROE (but not necessarily a higher ROA) and with increased risk as a result of being more leveraged (Correia, 2019).

Large capital expenditures in one year may also result in a significantly lower ROA compared to ROE. New assets may not have started generating income at the time of measurement. Thus, an increase in the asset base with no increase in profitability results in a lower ROA value. Conversely, older and depreciated assets may have very low book values, resulting in higher ROA values compared to ROE (Correia, 2019).

Certain ratios may highlight strong points of company performance whereas others may highlight weaker points (Correia, 2019). Owing to the limitations of ratio analysis, several different ratios are required to understand company performance as a whole. In addition, although accounting measures and market measures are both measures of performance, the measures may not be related owing to conflicts between achieving short-term and long-term goals (Gentry & Shen, 2010). Rowe and Morrow (1999) suggest that using both market and accounting measures increases measurement reliability because their combined use creates a composite measure of performance.

Non-financial performance is generally measured in relation to the governance practices, social and environmental performance of the company. Two measures are used in this study: an Environmental Score and a Social Score²². The Environmental and Social Pillar Scores for each country are determined by Refinitiv. Refinitiv takes public information and assigns a score based on 178 Environmental, Social and Governance factors. Refinitiv assigns an individual score to each Pillar and then equally weights these scores to determine the overall Environmental, Social, and Governance (ESG) score (which ranges from D- to A+).

The Environmental Score is evaluated on three broad categories: 1) reducing the use of natural resources, 2) reducing the release of environmental emissions and implementing recycling practices, and 3) innovative ways to reduce the company's consumer impact on the environment through eco-designed products. The Social Score is evaluated on four broad categories: 1) satisfaction, health, safety and equal opportunity of the company's workforce, 2) respecting fundamental human rights 3) provision of quality goods and services to customers ensuring their health, safety and privacy protection, and 4) being a good corporate citizen, protecting public health and practicing good business ethics (Refinitiv, 2019). The scores ranging from D- to A+ are recoded from 1 to 12, with 1 being D- and 12 being A+ to form continuous variables. This method is similar to that of Nadeem et al. (2017) who used the Bloomberg ESG score to measure corporate sustainability practices.

Independent Variables

Gender diversity is primarily measured as the percentage of female directors on the company's board of directors. A large body of the reviewed literature measured gender diversity based on whether or not there is at least one female director (Gordini & Rancati, 2017; Green & Homroy, 2018; Joecks et al., 2013; Kılıç & Kuzey, 2016;

²² The ESG Score is combination of three pillars which determines the overall score, namely 1) Environmental, 2) Social and 3) Governance pillars. Gender diversity at a board level is one of the governance factors used to determine the Governance Pillar score. Thus, it is inappropriate to use this pillar in the independent variable, because the independent variable of interest to this study is female representation on boards i.e. gender diversity. Therefore, only the individual Environmental and Social Pillar scores are used (Refinitiv, 2019).

Nadeem et al., 2017). Because 84% of the sample companies in this study had at least one female director, this method was not considered appropriate as a measure of gender diversity. Thus, the percentage of female directors was chosen as a preferable measure, as used by Alazzani et al. (2017), Gordini and Rancati (2017) and Marinova et al. (2016).

An additional binary variable is created to indicate whether there are three or more female directors on the company's board of directors. This is the "critical mass" referenced previously in the Literature Review. Konrad et al. (2008) show that companies with at least three women on the board benefit the most from their contribution.

Interaction Terms

The relationship between company performance and female representation (percentage of women on the board and critical mass) is dependent on the country in which the specific sample company is situated. Thus, in order to test the third research question, interaction terms between the independent variables and the categorical country variables are created.

Control Variables

In order to control for various other factors in a company which may affect financial and non-financial performance and female representation on boards, the following control variables are included in the testing:

- The sector in which the company operates. Female representation tends to be more concentrated in Consumer Goods and Financial Services (Adams & Ferreira, 2009; Grosvold et al., 2007; Joecks et al., 2013). Thus, the sector may impact the number of women on the board. Further, the nature of the sector may influence the performance measures because industries have different sector averages for performance ratios (Kharatyan, Lopes, & Nunes, 2017).
- The country in which the company operates (Byron & Post, 2016; Kakabadse et al., 2015). Country specific conditions, such as economic participation, educational advancement and gender quotas for board composition, may influence the results. The economic environment of the country may also

influence the profitability and performance measures of the company. Favourable market conditions allow for economic growth (Peric & Vitezic, 2016) and unfavourable conditions severely affect profitability (Rollins, Nickell, & Ennis, 2014).

- Financial Reporting Framework. A categorical variable is used to control for differences in reporting frameworks.
- The size of the company. Size is usually a determinant for company performance (Isidro & Sobral, 2015). The natural log of total assets is used to control for size (Isidro & Sobral, 2015; Kılıç & Kuzey, 2016; Lückerath-Rovers, 2012).
- Leverage. The more leveraged a company is, the more risk it carries and the closer it may be to breaching covenants (Abdullah, 2014). Consistent with Kılıç and Kuzey (2016) and Gulzar et al. (2019), leverage is measured as total debt over total assets.
- The size of the board. The size of the board may affect the impact of gender diversity (Grosvold et al., 2007) or company performance (Arulvel & Pratheepkanth, 2019; Azeez, 2015). Board size is measured as the total number of board members (Gulzar et al., 2019; Liao et al., 2018; Sanan, 2016).

The Table in Appendix B below summarises each of the variables to be used in the testing undertaken in this research study.

Research Method

As a starting point, descriptive statistics are set out for all continuous variables to understand the current environment of women on the board of directors. In addition, an analysis of female representation per country and per sector will be assessed by measuring the mean percentage of women for each year in the sample period.

A linear mixed regression is used to assess the impact of female board members on company performance. The data consists of panel data with multiple observations for the same individual (i.e. each sample company) at various points in time i.e. longitudinal data. The longitudinal data is considered to be multilevel data. Level 1

represents the repeated measures each year. Level 2 represents the unit of analysis, being the company.

The data displays both fixed and random factors. Fixed factors are categorical variables that are chosen to present specific conditions that are of interest *viz.* the country. Random factors are variables which are randomly sampled from an entire population *viz.* individual companies. Not all random factors are present in the data because it is only a sample from the larger population. However, the results of the analysis of random factors are used to make inferences about the entire population. Both fixed and random factors are present in the data and, therefore, both fixed and random effects need to be present in the model (West, Welch, & Galecki, 2007).

Fixed effects, namely the regression coefficients, explain the relationship between the dependent variable and independent variable (West et al., 2007). Fixed effects control for all time-invariant variables (country, sector and financial reporting framework) to estimate changes within an individual and eliminate bias from any omitted time-invariant variables (Kohler & Kreuter, 2009). Therefore, fixed effects assume that each individual (company) is functionally identical (Borenstein, Higgins, & Rothstein, 2009) and consequently fixes the intercept and the slope of the model.

Random effects are random values in the model applied to a random factor (West et al., 2007). Random effects allow for individual effects, such as time-invariant variables, to be explanatory variables and to influence the dependent variable. Random effects can either be included as random intercepts or random slopes (coefficients). Random intercepts represent random deviations for an individual from the fixed intercept (West et al., 2007). Random slopes allow for the expected change in the dependent variable for one unit of the independent variable to differ per company. Thus, random intercepts and random slopes allow for each company to form a unique relationship between the dependent and independent variable (Pillinger, 2019).

Individual companies are considered levels of the random factor company by design because they are randomly sampled from a larger population of companies. All levels of classification are not present in the dataset and the intention is to make inferences about the larger population. As a result, the expectation is that individual companies

will deviate from the overall fixed intercept. Therefore, random intercepts are included in the model. Further, substantial differences between companies are expected as companies in the sample are different sizes, have different policies, and operate in different industries and institutional and economic environments. Random slopes allow for the explanatory variables to have a different effect for each individual company and, therefore are included in the model. The fixed factors are the categorical country variables because these countries were specifically chosen to demonstrate varying levels of gender parity and differences in cultural norms, (West et al., 2007).

Conventional linear models assume that data points are independent. Owing to the fact that the data consists of multiple observations of the same individual company over time, data points within an individual company are expected to be correlated, thus violating the independence assumption (West et al., 2007). Linear mixed models estimate the covariance parameters to incorporate the correlation from the multiple observations. The flexibility of the linear mixed model allows for fixed effects, random coefficients and random slopes. Thus, the linear mixed model is considered appropriate for data collection in this research study.

A linear mixed regression model is repeatedly used to test each performance measure (ROA, ROE, Tobin's Q, Environment Score and Social Score) against the percentage of women on the board or against critical mass (independent variables). The regression models are repeated, including interaction terms between the country variable and the independent variables, to identify whether the impact of women on the board on company performance for each performance measure is statistically different in Japan and South Africa, compared to Australia, being the reference group for the regression analysis. The equations for each model are presented below:

Model 1:

$$Performance_{ij} = \beta_0 + \beta_1 percentwob_{ij} + \sum \beta_{2-3} sector_{2-3} + \sum \beta_{4-5} country_{2-3} + \sum \beta_{6-7} frf_{2-3} + \beta_8 lnta_{ij} + \beta_9 lev_{ij} + \beta_{10} boardsize_{ij} + u_{0j} + u_1 percentwob_{ij} + \varepsilon_{ij}$$

Model 2:

$$Performance_{ij} = \beta_0 + \beta_1 cm_{ij} + \sum \beta_{2-3} sector_{2-3} + \sum \beta_{4-5} country_{2-3} + \sum \beta_{6-7} frf_{2-3} + \beta_8 lnta_{ij} + \beta_9 lev_{ij} + \beta_{10} boardsize_{ij} + u_{0j} + u_1 cm_{ij} + \varepsilon_{ij}$$

Model 3:

$$Performance_{ij} = \beta_0 + \beta_1 percentwob_{ij} + \sum \beta_{2-3} sector_{2-3} + \sum \beta_{4-5} country_{2-3} + \sum \beta_{6-7} frf_{2-3} + \sum \beta_{11-12} percentwob_{ij} * country_{2-3} + \beta_8 lnta_{ij} + \beta_9 lev_{ij} + \beta_{10} boardsize_{ij} + u_{0j} + u_1 percentwob_{ij} + \varepsilon_{ij}$$

Model 4:

$$Performance_{ij} = \beta_0 + \beta_1 cm_{ij} + \sum \beta_{2-3} sector_{2-3} + \sum \beta_{4-5} country_{2-3} + \sum \beta_{6-7} frf_{2-3} + \sum \beta_{11-12} cm_{ij} * country_{2-3} + \beta_8 lnta_{ij} + \beta_9 lev_{ij} + \beta_{10} boardsize_{ij} + u_{0j} + u_1 cm_{ij} + \varepsilon_{ij}$$

In the equation “ β_0 ” represents the regression intercept, “ β_{1-12} ” the regression coefficient, “ u_0 ” represents the random intercept (i.e. the deviation from “ β_0 ”), “ u_1 ” the random co-efficient and “ ε ” represents the error term. The subscripts “ i ” reflects the repeated measures of years, being 1-3 years (2016-2018) and “ j ” reflects the number of individual companies, being 1-294 companies. The remaining variable terms in the equation are explained in Appendix B.

Limitations

Existing literature has posed the question of whether strong company performance results in increased female representation on the board, or whether female representation on the board increases company performance (Nadeem et al., 2017; Sabatier, 2015; Yang et al., 2019). Although this study does not consider endogeneity, recent studies have tested the impact of endogeneity between female representation and company performance and found there to be little to no impact (Lu & Herremans, 2019; Sila et al., 2016). Nadeem et al. (2017) and Sabatier (2015) controlled for endogeneity and a positive relationship between female representation on the board and company performance remained constant. Thus, despite this study lacking a consideration of endogeneity, the existing literature review has shown that its impact on the relationship between female representation and company performance is small.

Another limitation to this research study is the lack of uniform accounting standards. Uniform accounting standards strengthen the comparability of the accounting performance measures because it ensures consistent presentation of financial information across the companies. Although the use of uniform accounting standards is not present in the sample, 79% of the total sample uses IFRS and differences in accounting standards on performance measures have been controlled for in the model.

Results

Descriptive Statistics

The descriptive statistics begin with a presentation of summary statistics for all continuous variables over the three-year sample period. The summary statistics will show the minimum, mean, median, maximum and standard deviation of all variables. Following that, the correlation results and regression results will be presented. Table 1 starts with the summary statistics of all the continuous variables.

Table 1: Summary statistics of all continuous variables over the three-year sample period.

Variable Name	Min	Mean	Median	Max	Std Dev.
Return on assets	-34.02	5.88	4.84	53.68	7.17
Return on equity	-48.47	13.59	11.80	103.31	13.68
Tobin's Q	0.49	1.83	1.33	14.28	1.51
Number of board members	4.00	10.41	10.00	25.00	3.21
Number of men on the board	3.00	8.57	8.00	25.00	3.33
Number of women on the board	-	1.85	2.00	8.00	1.34
Percentage of women on the board	-	18.69	16.67	66.67	13.50
Environmental score	2.00	8.35	9.00	12.00	2.42
Social score	2.00	8.32	9.00	12.00	2.18

The large spread between the minimum and maximum and the large standard deviation of performance measures indicate that there is variation in company performance within the sample. Companies at the lower end include Beach Energy Limited (Australia) with an ROA of -34.03 and ROE of -48.47 for 2016 and Xero Limited (Australia) with an ROA of -23.34 and an ROE of -26.40 for 2017. Beach Energy Limited operates in the oil and gas industry. During the 2016 year, the oil and gas industry experienced a challenging operating environment (PwC, 2018). Beach Energy showed a 33% decline in realised oil prices which reduced their margins and

resulted in a significant loss for the year (Beach Energy, 2016). Xero Limited is a cloud-based accounting computer software company. The losses are driven by high operating expenses, but economies of scale are expected in the 2018 financial year (Xero Limited, 2017). This can be seen through improved performance with ROA moving to -7.74 and ROE moving to -10.71 in the 2018 financial year. A challenging operating environment for the oil and gas industry and company specific factors have been identified as contributors to poor performance.

Companies with the largest ROA include Magellan Financial Group (Australia) with an ROA of 53.68 in 2016 and 44.28 in 2017. Naspers Limited (South Africa) also showed a high ROA at 39.59 for 2018. Magellan Financial Group also displays relatively high ROE values at 60.22 for 2016 and 48.47 for 2017. Naspers Limited showed an ROE value of 59.19 for the 2018 financial year.

Magellan Financial Group is a fund management company. The company manages over USD \$40 billion worth of investments. The company also has very little debt relative to its asset base resulting in a consistent increase in revenue. The revenue for the 2016 financial year grew by USD \$65 million whereas its expenses grew by just under USD \$20 million year on year (Magellan Financial Group, 2016). The high margins and low levels of debt are reflected in both ROA and ROE ratios being relatively high and in line with each other for 2016 and 2017. Similarly, Naspers Limited experienced high levels of profitability and low levels of financial leverage in 2018. The large multinational earned the second highest profit figure in the sample (Toyota Motor Corporation, Japan, was first). Thus, both accounting performance measures are relatively high but in line with each other.

Companies in the sample with high ROE values include Sydney Airport Group (Australia) with highest ROE at 103.31 for the 2018 financial year. Amcor Plc (Australia) also displays high ROE values with an ROE of 79.48 for 2018 and 75.38 for 2017. However, the companies with the largest ROE values show relatively low ROA values. Sydney Airport Group reported an ROA value of 2.94 in 2018 whereas Amcor Plc reported ROA values of 7.99 and 6.72 for 2018 and 2017 respectively.

Sydney Airport Group has not experienced unusually high profit levels compared to the companies in the sample, however, the Sydney Airport Group is significantly leveraged. It has one of the highest levels of leverage in the sample, second only to

Nomura Holdings Incorporation (Japan). In addition, Sydney Airport Group invested over AUD \$300 million in 2018 in capital expenditure (Sydney Airport Group, 2018). The high levels of leverage and increased capital expenditure contributes to the higher ROE value and lower ROA value. Similarly, Amcor Plc is considerably more leveraged than the companies in the sample, contributing to higher ROE values.

Xero Limited had the highest Tobin's Q value of 14.28 in 2018, despite accounting performance measures being negative. The rapid reduction of losses in 2018 may have boosted investor confidence in the company based on the expectation of future profits, and thus an increased market value resulted. Harmony Gold Mining Company Limited (Harmony Gold) has the lowest Tobin's Q value at 0.49 in 2017. Harmony Gold is a mining company based in South Africa which was profitable in 2018, however, job losses and disagreements between government and the Chamber of Mines on the Mining Charter (Harmony Gold Mining Company, 2017) reduced investor confidence in the company's ability to generate future returns.

The descriptive statistics support the need for both multiple accounting performance measures and a market measure. Different levels of performance are reflected depending on which performance measure is used and, thus, multiple measures contribute to a more holistic understanding and overall level of financial performance.

The maximum board size of 25 is attributable to Toray Industries, a Japanese company. The maximum number of male directors is also 25 (also Toray Industries), indicating that the largest board in the sample is an all-male board. The maximum percentage of women on the board is at 67% and the maximum number of women on the board is 8. Both measures are attributable to JSE Ltd, a South African company. The contrast highlights that country-level factors potentially influence female representation on a company's board.

The median number of women on the board is 2, indicating that the median company does not have a critical mass of female directors. The median score for both the Environmental and Social Scores is 9, and the mean scores are 8.35 and 8.32 respectively. Together with the small standard deviation for the Environmental Score at 2.42 and Social Score at 2.18, the descriptive statistics suggest that companies are performing fairly similarly in terms of environmental and social impact.

Companies with low environmental and social scores include Keyence Corporation, a Japanese company, with a score of 2 for both environmental and social performance in 2017. Keyence Corporation is a manufacturer of digital products including automated sensors, digital microscopes and barcode readers. The information and communications technology (ICT) industry has been under scrutiny due to forced labour practices in its global supply chains (McAvoy, 2016). In 2016, KnowTheChain, an organisation that benchmarks corporate practices, ranked 20 ICT companies on its strategies to eliminate forced labour (McAvoy, 2016). The scoring was out of 100, with 100 being the highest. Keyence Corporation scored the lowest value of all 20 companies, with a score of 0 (KnowTheChain, 2016), contributing to a low social performance score. Censible, a platform that aggregates ESG data (Censible, 2020a), noted that Keyence Corporation underperformed compared to its competitors in areas such as pollution prevention and water conservation (Censible, 2020b), resulting in a low environmental performance score. Other companies on the lower end of environmental and social performance include Brait SE (South Africa) and Sumitomo Realty and Development Company Limited (Japan) (both in the Financial sector, each with a score of 3 for environmental and social performance for 2017) and TPG Telecom Limited (Australia) in the ICT industry, scoring 3 for environmental performance and 2 for social performance in 2018.

Companies with high environmental and social scores include Komatsu Limited Kumba Iron Ore Limited, the first being Japanese and the second being South African. Both companies scored a 12 for environmental and social performance in 2018. Komatsu Limited manufactures construction and mining equipment, and Kumba Iron Ore Limited operates mines for iron-ore. Both companies have outperformed in areas such as their use of natural resources, reduction in carbon emissions, workforce protection and community initiatives, all contributing to higher environmental and social performance. Of all the companies in the sample that scored a high of 12 for both environmental and social performance, approximately 70% of companies were from the Industrial sector. Studies suggest that Industrial sector experiences direct environmental and labour risks (Prado-Lorenzo, Rodríguez-Domínguez, Gallego-Álvarez, & García-Sánchez, 2009; Weber, Diaz, & Schwegler, 2014) and stakeholder pressure to implement corporate social responsibility activities (Darnall, Henriques, & Sadorsky, 2010; Kassinis & Vafeas, 2006; Weber et al., 2014) resulting in improved

social and environmental performance. The descriptive statistics suggest that the sector in which the company operates may influence its environmental and social performance.

The summary statistics in Table 1 show that the average percentage of women on the board is 19% over the three years in the sample period. Table 2 gives further insight on how that figure is spread across each year and for each country in the sample.

Table 2: Percentage of female directors on the board of directors per country.

	2016	2017	2018	3Y Average
Australia	27%	29%	32%	29%
South Africa	19%	21%	25%	22%
Japan	6%	7%	8%	7%
All	17%	19%	22%	19%

While the average female representation over three years for all countries was 19%, Australia and South Africa show a higher average of 29% and 22% respectively, and Japan a much lower average of 7%. Both Australia and South Africa had only one company that had no female directors over the sample period. Japan had 31 companies with no female directors. This result indicates that females are underrepresented on the boards of directors in Japan relative to Australia and South Africa.

Australia had the highest gender parity in terms of Female Economic Participation and Opportunity and Female Education Attainment scores as measured by the World Economic Forum (2018a). Furthermore, both Australia and South Africa have voluntary corporate governance practices that promote gender diversity on the board of directors, whereas Japan has no such structures in place (Terjesen et al., 2016). Women in Japan perform five times the amount of unpaid work²³ per day compared to men. In South Africa and Australia, women perform unpaid work 2.1 and 2.5 times (respectively) more than men. This finding suggests that despite women making up more than 40% of the workforce and professional workers in Australia, South Africa

²³ Unpaid work consists of routine housework, shopping, caring for household and non-household members and travel related to household activities (World Economic Forum, 2018a, p. 47).

and Japan (World Economic Forum, 2018a), women still play a key role in maintaining the household which may contribute to the lack of female representation on companies' board of directors. This disparity is especially prevalent in Japan despite that country having better gender parity in terms of equal education for men and women when compared to South Africa (World Economic Forum, 2018a). Thus, the results in Table 2 suggest that solely increasing education opportunities for women is not sufficient to increase female representation at a board level. Opportunities for women and a shift in cultural norms need to be in place to achieve gender diversity on companies' board of directors.

More positively, Table 2 shows an increase in female representation on the board of directors for each country, year on year, throughout the sample period. In 2018, women represented 22% of the board on average across all three countries and sectors. However, in that same year, women constituted between 44%-47% of the workforce in Australia, Japan and South Africa. For professional and technical workers, these statistics are even higher: women constitute between 40%-52% of the professional and technical workers in these countries (World Economic Forum, 2018a). Thus, the current workforce consists of skilled and professional women, but these women are not being represented proportionately at a board level.

Further analysis of the distribution of female directors across different sectors was performed. Table 3 shows the female representation on the board of directors per sector.

Table 3: Percentage of female directors on the board of directors per sector

	2016	2017	2018	3Y Average
Financials	20%	22%	26%	23%
Industrials	16%	17%	20%	17%
Resources	15%	20%	23%	19%
All	17%	19%	22%	19%

Prior literature has shown that women are better represented in the Financial and Consumer Goods sector, (Adams & Ferreira, 2009; Grosvold et al., 2007; Joecks et al., 2013). Table 3 shows that female representation is the highest in the Financial

sector at 23%. Although the Industrial sector has the lowest percentage of women, it has the highest number of females on the board over the three years of the sample period. Over the sample period, the Industrial sector had an average of 242 women; the Resources sector had an average of 13 women; and the Financial sector had 146 women. The number of women is of relevance when considering the impact of critical mass because women may prefer less male-dominated sectors and those that interact with the final consumer (Brammer et al., 2009). This may further suggest that women have a better understanding of the Financial and Industrial sectors than the Resources sectors because they may not have gained the relevant expertise required to serve as a director in the Resources sector as a result of the workforce being male-dominated. However, although females are under-represented in the Resources sector, female representation has increased year-on-year, suggesting that measures are in place to improve gender diversity in the Resources sector.

Correlation Analysis

A Pearson correlation is used in this research study to measure the linear correlation between pairs of continuous variables. A Pearson correlation identifies near-linear relationships between pairs of variables. A variable inflation factor test is further performed to identify multi-collinearity between the independent variables. Table 4 shows the results of the Pearson correlation for all continuous variables used.

Table 4: Pearson correlation results for all continuous variables

	ROA	ROE	Tobin's Q	Percentage of women on the board	Critical Mass	Environmental Score	Social Score	Natural log of total assets	Leverage	Board Size
ROA	1.000									
ROE	0.751	1.000								
Tobin's Q	0.509	0.395	1.000							
Percentage of women on the board	0.039	0.158	0.061	1.000						
Critical Mass	-0.032	0.091	-0.045	0.729	1.000					
Environmental Score	-0.161	-0.053	-0.305	0.010	0.091	1.000				
Social Score	-0.080	-0.011	-0.150	0.203	0.224	0.625	1.000			
Natural log of total assets	-0.367	-0.231	-0.479	-0.220	0.010	0.511	0.304	1.000		
Leverage	-0.221	-0.015	-0.198	0.046	0.022	0.087	0.014	0.200	1.000	
Board Size	-0.150	-0.100	-0.223	-0.245	0.088	0.210	0.123	0.407	0.009	1.000

Table 4 indicates that the financial performance measure, ROA, has a strong positive²⁴ correlation with ROE (0.751) and a moderately positive correlation with Tobin's Q (0.509). Although a strong positive correlation exists, the performance measures can differ vastly within a company as seen in the descriptive statistics. Further, in order to have a comprehensive reflection of performance, multiple performance measures are used (Rowe & Morrow, 1999). The non-financial measures (Environmental Score and Social Score) have a moderately positive correlation (0.625) with each other.

A strong positive correlation (0.729) between the percentage of woman on the board and critical mass is also observed. This result supports the method of performing separate regressions for these two categories as the independent variable with each performance measure. Consistent with Isidro and Sobral (2015) and Willows and van der Linde (2016) separate regressions for the percentage of women on the board and critical mass are performed because the two measures are highly correlated. Table 4 further shows that the Pearson correlation coefficients between the independent variables are relatively low (0.009 – 0.407) indicating that near-linear dependence between pairs of regressors are not present (Ratner, 2009). A variable inflation factor (VIF) test was performed on all continuous variables. VIF values ranged from 1.09 – 2.93. All variables had a VIF lower than 10, indicating that multicollinearity is not present in the model (Hair, Black, Babin, & Anderson, 2014).

Regression Analysis

For each regression performed, the Wald chi-squared test results were statistically significant at the 1% level. This result indicates that variables in the model have explanatory properties (Agresti, 2002). A likelihood-ratio test was performed for each regression. The results were statistically significant at the 1% level indicating that the mixed effects linear model is a better fit for the data than a one-level ordinary linear regression model (Agresti, 2002; Meloun & Militky, 2011). Lastly, two goodness-of-fit tests were performed using residual analysis. First, a histogram of the residuals was plotted which indicated that the distribution of the residuals did not deviate seriously

²⁴ A strong positive correlation has a value of greater than 0.7. A moderate positive correlation ranges between 0.7 – 0.3. A low positive has a value lower than 0.3 (Ratner, 2009).

from a normal distribution. Therefore, the histogram indicates the model is a good fit (West et al., 2007).

The standardized residuals for all models were plotted against the conditional predicted values. Models using the performance measures ROA, ROE, Environmental Score and Social Score predominantly followed a horizontal band barring some outliers, thus not seriously violating the assumption of constant variance (West et al., 2007). Models which used Tobin's Q as a performance measure presented a cone shaped pattern in the distribution of the residuals, demonstrating that heteroscedasticity is present in the model. Therefore, models that include Tobin's Q as a performance measure were run using robust standard errors to account for heteroscedasticity (Hoechle, 2007).

The regression analyses were repeated for the performance measures ROA, ROE, Environmental Score and Social Score with outliers removed from the dataset (Booyesen, Botes, & Hamer, 2017). The direction of all relationships remained the same i.e. positive relationships remained positive and negative relationships remained negative. The statistical significance of the correlations between the performance measures and the independent variables remained unchanged in all but three instances. The statistical significance of the correlation between ROA and the percentage of women on the board moved from the 10% confidence level to 5%; between ROE and the percentage of women on the board moved from 1% to 5%; and between ROA and critical mass moved from 10% to 5%. The coefficients of the independent variables of each model were also impacted by removing the outliers. However, the impact on the coefficients is small. Differences between 0.0004 and 0.41 were noted between the independent variable regression coefficients with all the data compared to the independent variable regression coefficients with the outliers removed. Therefore, outliers present in the model do not significantly change the model output or the conclusions drawn from the model.

To identify whether female representation on the board has an impact on company performance, Table 5 presents the results of the regression for financial performance measures for all data points with percentage of women on the board and critical mass as the independent variables. Table 6 represents the regression results for non-

financial performance. Lastly, an analysis of the regression results including interaction terms is presented. The reference groups for the categorical variables are as follows: Australia for the country variable, Financials for the sector variable, and IFRS for the reporting framework variable.

Financial Performance

Table 5: Regression results for the impact of female representation on the board on financial performance.

	Test 1: Percentage of women on the board			Test 2: Critical Mass		
	ROA	ROE	Tobin's Q	ROA	ROE	Tobin's Q
Percentage of women on the board	0.043* (0.025)	0.145*** (0.056)	0.016*** (0.005)			
Critical Mass				1.154* (0.592)	2.571** (1.229)	0.235* (0.127)
Industrials	0.733 (0.79)	2.523* (1.520)	0.089 (0.169)	0.773 (0.79)	1.238 (1.69)	0.095 (0.206)
Resources	-2.505 (1.811)	-7.706** (3.455)	-0.740*** (0.256)	-2.475 (1.812)	-7.617** (3.854)	-0.698*** (0.249)
Japan	1.693 (1.154)	1.322 (2.144)	0.408 (0.251)	1.459 (1.08)	0.679 (2.258)	0.290 (0.285)
South Africa	-1.868** (0.904)	-0.0686 (1.816)	-0.657*** (0.194)	-2.025** (0.892)	-0.563 (1.894)	-0.766*** (0.21)
JP GAAP	-0.811 (0.985)	-1.609 (1.652)	-0.18* (0.109)	-0.796 (0.985)	-2.784 (1.971)	-0.172 (0.105)
US GAAP	0.444 (1.368)	-0.695 (2.337)	-0.128 (0.094)	0.415 (1.366)	-0.996 (2.831)	-0.038 (0.094)
Natural Log of Total Assets	-1.614*** (0.241)	-1.456*** (0.463)	-0.373*** (0.0611)	-1.640*** (0.243)	-1.69*0** (0.511)	-0.420*** (0.079)
Leverage	-0.091*** (0.019)	-0.006 (0.035)	-0.008*** (0.003)	-0.090*** (0.019)	-0.023 (0.04)	-0.008* (0.004)
Board Size	0.139 (0.111)	0.134 (0.192)	0.0049 (0.0112)	0.099 (0.112)	0.121 (0.228)	<-0.001 (0.0123)
Constant	20.16*** (2.278)	21.46*** (4.214)	5.226*** (0.602)	21.36*** (2.234)	27.61*** (4.745)	5.963*** (0.837)
Wald chi-squared(10)	114.71***	42.33***	110.28***	103.85***	35.8***	72.7***
Observations	863	860	863	863	860	863
Groups	294	293	294	294	293	294

* p<0.1, ** p<0.05, *** p<0.01. The numbers without brackets presents the regression coefficients and bracketed numbers presents the standard errors.

Consistent with Sanan (2016), the results show that female representation on the board of directors (Test 1) has a statistically significant positive correlation to company performance in terms of accounting measures and market measures. Statistically, a 1% increase in the percentage of women on the board will result in increases of 0.043% for ROA, 0.15% for ROE and 0.016% for Tobin's Q. The average board size in the sample is ten members. Therefore, one woman on the board would equate to 10% of the board. Thus, when one woman is added to the board, *ceteris paribus*, ROA, ROE and Tobin's Q increase by 0.43%, 1.5% and 0.16% respectively. An increase in ROA would be driven by either an increase in profit or a reduction in the asset base. The mean net profit for the sample is USD \$1.066 billion. Assuming the asset base is kept constant, an increase of 0.43% in ROA results in a USD \$4.58 million increase in net profit. Thus, these coefficients are economically significant, due to the increased profitability in dollar terms.

When a company has reached critical mass in terms of the number of women on the board (Test 2 in Table 5), this also has a statistically significant positive correlation on company performance. When a company has three or more female directors, *ceteris paribus*, ROA increases by 1.15%, ROE by 2.57% and Tobin's Q by 0.24%, compared to companies that have fewer than three female directors²⁵. These results are consistent with the findings of Willows and van der Linde (2016) and thus suggest that companies experience a greater benefit from a female's contribution when there are three or more female directors (Konrad et al., 2008). These results suggest that female representation on the board positively impacts financial performance in terms of both accounting and market measures, thus answering this study's first research question and confirming the alternative hypothesis.

Table 5 shows that the Industrial Sector has a statistically significantly higher ROE than the Financial Sector (in Test 1) and the Resources Sector has a statistically significantly lower ROE and Tobin's Q than the Financial Sector (in Test 1 and 2). The standard deviations for ROE (as seen in Table 1) are much larger at 13.68 compared to ROA at 7.17, which demonstrates more variability in the ROE performance measure

²⁵ An increase of 1.15% results in a net profit increase of 12.26 million USD, assuming a constant asset base.

compared to ROA. The reviewed literature does not offer an explanation as to why performance measures vary between the Financial and Industrial Sectors nor do specific market events during the period related to these two sectors. However, significant differences in performance measures per sector have been noted (Isidro & Sobral, 2015). Lückerath-Rover (2013) showed a statistically significantly lower ROE in the Financial Sector relative to Non-financial Sectors for Dutch companies. Using industry averages obtained from Damodaran (2020), the Financial Sector displayed a lower average ROE compared to the Industrial Sector average in 2019 for US companies. These results are consistent with what is seen in Table 5. The lower Tobin's Q and ROE scores for the Resources Sector relates to Oil and Gas companies. These companies face unique challenges such as low oil and gas prices, the exploration for and discovery of shale gas, renewable energy (Van Der Ploeg, 2016) and cyclical over- and under-supply of oil (PwC, 2018). Between 2014 and 2016, oil and gas companies experienced a period of over-supply, resulting in lower oil prices and lower profits (England, 2016). Although the Oil and Gas sector is moving towards a period of under-supply, driving oil prices and profits up (Dickson, 2019), companies need time to recover from the volatility of the sector to see improved company performance (PwC, 2018). Thus, there are unique factors, such as cyclical supply and demand, experienced by the Oil and Gas sector between 2016 and 2018 which may contribute to lower ROE's and Tobin's Q's in comparison to those of the Financial Sector.

For the country variables, Table 5 shows that South Africa has a statistically significantly lower ROA and Tobin's Q when compared to Australia. Unlike Australia, South Africa is an emerging market (World Economic Situation and Prospects, 2014) currently experiencing a weak economic environment. This weak economic environment and slow growth potential (The World Bank, 2018) may result in lower corporate profitability. Tobin's Q reflects the sentiment of investors on the current and future prospects of the company (Rahman, Ibrahim, & Ahmad, 2017). The slow growth experienced in the South African market may influence investors to apply caution when valuing South African companies (Cairns, 2019).

Companies using Japanese GAAP are shown to have a statistically significant lower Tobin's Q than those using IFRS (in Test 1 of Table 5). The voluntary adoption of IFRS

for listed Japanese companies was introduced in 2010 (Gray, Nagata, Nakamura, & Ozu, 2019) which allowed listed Japanese companies to choose between Japanese GAAP, US GAAP or IFRS. In 2018, approximately 200 large multinationals representing 30% of the market capitalisation on the Tokyo Stock Exchange opted to use IFRS (Hoogervorst, 2018). Gray et al. (2019) suggests that while both adopters and non-adopters of IFRS agree that the transition is a costly exercise, adopters of IFRS believe that the benefit of international comparability, improvement in communication with overseas investors and improved transparency of financial information for shareholders, outweighs the transition costs. Gray et al. (2019) further argue that companies adopt IFRS when they expect favourable economic outcomes, such as improved market valuations and credit ratings. As a result, the use of IFRS compared to Japanese GAAP may influence investor sentiment and market value, as measured by Tobin's Q, due to improved communication and transparency with investors.

The final control variables show that the size (Natural Log of Total Assets) and leverage of the company is negatively statistically significant with all three performance measures (in both Test 1 and Test 2 of Table 5). Research suggests that although larger companies benefit from economies of scale, there is a limit to this benefit (Becker-Blease, Kaen, Etebari, & Baumann, 2010). At a certain level, medium and large companies experience the same economies of scale, but larger companies are exposed to higher transaction, agency and organisational costs which may reduce profitability and, thus, company value (Becker-Blease et al., 2010; Margaretha & Supartika, 2016). Leverage is also shown to have negatively statistically significant relationship with ROA and Tobin's Q. Leverage may reduce company value because it adds more risk to the company (Isidro & Sobral, 2015; Kartikasari & Merianti, 2016) and diverts resources from investments to debt commitments (Isidro & Sobral, 2015).

There is no statistically significant relationship between the size of the board and any of the three performance measures. Existing research demonstrates conflicting results between company performance and board size. Some studies show a positive relationship with board size and company performance and suggest that larger boards tend to be more efficient in monitoring activities, better at corporate governance and thus increase company value (Arulvel & Pratheepkanth, 2019; Johl, Kaur, & Cooper,

2015). Conversely, studies suggest that board size has a negative relationship with company performance due to higher operating costs, inefficient decision-making from less structure and control in meetings, and the risk of board members not fully participating and contributing to decisions, i.e. “free-riding²⁶” (Azeez, 2015; Nguyen, Rahman, Tong, & Zhao, 2016). Although Choudhary (2015) and van der Westhuizen and Willows (2016) show that board size has no impact on company performance owing to existing high corporate governance standards, Vaidya (2019) suggests that while there is no statistically significant relationship between board size and company performance, and that no optimal board size exists, companies with board sizes between eight and ten showed better financial performance than companies with board sizes outside that range.

Non-financial Performance

To answer the second research question of this study, the regression of the independent variables against Non-financial Performance measures (being the Environmental Score and Social Score measured by Refinitiv) is included in Table 6.

Table 6: Regression results for the impact of female representation on the board on Non-financial Performance.

	Test 1: Percentage of women on the board		Test 2: Critical Mass	
	Environmental Score	Social Score	Environmental Score	Social Score
Percentage of women on the board	0.009 (0.006)	0.019*** (0.006)		
Critical Mass			-0.020 (0.112)	0.200 (0.125)
Industrials	0.353 (0.3)	0.863*** (0.28)	0.372 (0.3)	0.875*** (0.285)
Resources	0.339 (0.713)	0.576 (0.666)	0.242 (0.716)	0.560 (0.678)
Japan	0.261 (0.368)	-0.383 (0.359)	0.029 (0.356)	-0.691** (0.347)
South Africa	0.007 (0.321)	-0.167 (0.304)	-0.023 (0.319)	-0.255 (0.307)

²⁶ “Free-riding” is defined as individuals benefiting from the work of others without contributing to the work themselves (Pasour, 1981).

JP GAAP	-0.045 (0.228)	-0.960*** (0.248)	-0.039 (0.231)	-0.955*** (0.249)
US GAAP	0.414 (0.323)	-0.057 (0.350)	0.397 (0.328)	-0.096 (0.352)
Natural Log of Total	0.702*** (0.081)	0.602*** (0.079)	0.725*** (0.082)	0.618*** (0.08)
Leverage	<-0.001 (0.006)	-0.009 (0.006)	0.001 (0.027)	0.019 (0.029)
Board Size	0.004 (0.027)	0.030 (0.029)	<-0.001 (0.006)	-0.009 (0.006)
Constant	1.202 (0.804)	1.931** (0.776)	1.277 (0.807)	2.318*** (0.783)
Wald chi-squared(10)	131.56***	103.66***	126.19***	93.5***
Observations	796	796	796	796
Groups	284	284	284	284

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The numbers without brackets present the regression coefficients and bracketed numbers present the standard errors.

Female representation on the board of directors is shown to have a statistically significant positive relationship with the Social Performance, but not the Environmental Performance, of a company. Furthermore, Table 6 indicates that the significant correlation with the Non-financial Performance measures is limited to the percentage of women on the board only; there is no statistically significant correlation between Critical Mass and Non-financial Performance measures. It is important to remember that the Social Performance score is measured as a continuous variable from 1 to 12, which was recoded from D- to A+. Thus, adding one woman to the board (assuming that one woman represents 10% of the board²⁷) will increase the Social Score by 0.19. These results are not economically significant, as an increase of 0.19 does not have a large impact on an improved Social Score. When explained further, it becomes obvious that for companies that are A-rated, an increase of 0.19 will not definitively push the company to an A+ rating, demonstrating limited economic significance.

²⁷ The average board size in the sample is ten members. Therefore, one woman on the board would equate to 10% of the board.

However, these results do confirm the findings of Alazzani et al. (2017) who suggested that women tend to pay more attention to social issues than environmental issues. Byron and Post (2016) and Hoyt (2017) suggest that female directors tend to focus on social issues as these align with their values pertaining to corporate social responsibility. These values include avoiding harm and feeling responsible for the wellbeing of others (Byron & Post, 2016) and are translated into strategic social decisions at a board level (Nielsen & Huse, 2010). Thus, in answer to the second research question, the results of this study show that women on the board positively influence the company's social performance but have no influence on its environmental performance.

The Industrials Sector has a statistically significantly higher social score than the Financial Sector. Studies show that CSR performance in the Financial Sector is weaker compared to other sectors (Ortas, Álvarez, & Garayar, 2015) owing to less pressure by stakeholders to improve CSR performance (Weber et al., 2014). In particular, Weber et al. (2014) suggest that the Financial Sector underperforms on social issues such as labour concerns and community initiatives because they have less of a direct impact and because labour issues are not as prevalent as in the Industrial Sector.

Table 6 also shows that Japanese companies have statistically significantly lower social scores than Australian companies (in Test 2 only). Although Japanese companies tend to be the front-runners for environmental policies, they lag behind in terms of social initiatives (Jackson & Bartosch, 2017). Jackson and Bartosch (2017) examined the CSR activities of 24 Organisation for Economic Co-operation and Development (OECD) countries. Japan was noted to have weak development in employment related CSR policies and gave less charitable donations than the average OECD country. This factor would contribute to a lower Social Score.

Also, companies that use Japanese GAAP have a lower Social Score than those that use IFRS. Large multinationals listed on the Tokyo Stock Exchange tend to use IFRS rather than Japanese GAAP (Bank of Japan, 2018); thus, these larger multinational companies may have more resources for social initiatives. Supporting this assumption, the natural log of total assets has a statistically significant positive relationship with

both the Environmental and Social Scores. D'Amato and Falivena (2019) suggest that larger companies have more resources and experience to effect environmental and social change. Lastly, the Environmental and Social Scores are based on public information. Larger companies tend to have better CSR disclosure than smaller companies which may influence their Environmental and Social Scores (Dias, Rodrigues, & Craig, 2017).

Cross-country Comparison

A country comparison is performed by running a new regression with interaction terms between the independent variables (Percentage of Women on the Board and Critical Mass) and the categorical country variables. The results of the regressions can be found in the Tables provided in Appendix C.

The results of the regression suggest that there is no statistically significant relationship between the interaction terms and the financial performance measures. This indicates that despite Australia, Japan and South Africa having different cultural norms, economic and regulatory environments, varying levels of gender parity in terms of Educational Attainment and Economic Participation and Opportunity, there is little difference between countries in terms of the impact that women on the boards of directors have on company performance. Explained differently, female representation on boards in Japan and South Africa have a similar impact on a company's financial performance as female representation on boards in Australia.

While country-level factors have little influence on the impact that women on the board have on financial performance, the descriptive statistics indicate that country-level factors may influence the number of women on the board. Of the three countries, Australia has the highest average level of female representation and Japan the lowest. Australia also has better gender parity in terms of Educational Attainment, Economic Participation and Opportunity than Japan and South Africa (World Economic Forum, 2018a). Therefore, the descriptive statistics suggest that gender parity, educational attainment, economic participation, economic opportunity and gender quotas are necessary to create gender diverse boards for companies. The lack of female representation on company boards in certain countries may contribute to mixed results (being female representation on the board having a positive, negative and no impact

on a company's financial performance) owing to the limited number of females in the sample. However, country-level factors itself do not influence the impact that women may have on financial performance.

Consistent with the results seen in financial performance, there is no statistically significant difference in the impact of women board members and non-financial performance between Japan and South Africa when compared to Australia. Contrary to the previously mentioned suggestion by Byron and Post (2016), country-level factors do not significantly influence the impact that women have on a company's social and environmental performance. The results of this study fail to reject the null hypothesis in respect of the final research question. Thus, country-level factors (such as differences in gender parity in terms of educational attainment and economic participation and opportunity, country culture and economic environment) do not influence the level of impact female board members have on company performance. Although no statistically significant relationships were found between country-level factors and the impact of female representation, the regressions presented in Tables 5 and 6 control for the influence of country-level factors on performance measures. A statistically significant positive relationship exists between female representation and financial and social performances. Nevertheless, as noted previously, the descriptive statistics suggest that country-level factors may influence the number of women represented on the board.

The statistically significant positive correlations between the percentage of women on the board and all financial performance measures remains when including interaction terms in the regression model. Conversely, the positive correlation between critical mass and ROE and Tobin's Q is no longer statistically significant. This fact may be as a result of companies with higher ROEs tending to more financially leveraged and, therefore, more risky (Correia, 2019). As previously mentioned, the reviewed literature suggests that women tend to be more risk-averse than men (Croson & Gneezy, 2009; Willows & West, 2014) which may contribute to the lack of statistical significance between critical mass and ROE. Willows and van der Linde (Willows & van der Linde, 2016) suggest that the presence of women is not being incorporated into shareholders' valuation of companies, and, therefore, is not reflected in Tobin's Q. Although the inclusion of the interaction terms may have weakened the relationship between critical

mass and financial performance, consistent with Table 5, the relationship remains positive and the coefficients remain larger than those in Test 1, (where percentage of women on the board was the independent variable) reiterating that companies with critical mass have improved financial performance compared to companies with less than three female board members.

Other notable differences between the regressions presented in Table 5 and those that include interaction terms (in Appendix C) are that the Industrials Sector no longer has a statistically significantly higher ROE than the Financial Sector, and South Africa no longer has a statistically significantly lower ROE than Australia, but Japan has a statistically significantly higher ROA and Tobin's Q than Australia (in Test 1). The results suggest that the relationships between the control variables and performance measures are not as strong as previously presented in the reviewed literature.

Conclusion

The review of existing literature conducted for this study has demonstrated mixed results between female representation on a company's board and its financial performance. This research has suggested a number of reasons for these mixed results, such as the use of different performance measures, single-country studies (Byron & Post, 2016) and the omission of critical mass (Lückerath-Rovers, 2013). This study extends existing literature by examining a cross-country comparison between the percentages of women on the board and exploring the impact of having critical mass using multiple performance measures.

The results of the research undertaken show that female representation on the board has a positive and significant relationship on accounting and market measures of the company's financial performance. The results support other research findings that suggest that women have unique skills compared to men. Their expertise²⁸ and added diversity enhance board decision-making (Kim & Starks, 2016) and contribute to improved profitability. Critical mass also shows a positive and significant relationship with financial performance measures. These findings also support research that suggests women are able to improve their contribution when there are three or more women on the board, compared to when there are less than three (Konrad et al., 2008).

Female representation on the board is also shown to have an impact on non-financial performance. The results of the regression show that female representation on the board is positively and significantly related to social performance at the 1% confidence level. Research suggests that women affect social performance in particular owing to their individual values and caring nature (Hoyt, 2017). The research results also support the idea that women contribute indirectly to company performance through higher social standards and social impact (Isidro & Sobral, 2015).

Australia, South Africa and Japan were specifically explored owing to the contrast in cultures and differential gender parities. The research results show that country-level

²⁸ Refer to footnote 4 in the Board Diversity subsection of the Literature Review for the areas of expertise identified by Kim and Starks (2016).

factors do not significantly influence the impact that women on the board have on financial and non-financial performance. However, the descriptive statistics indicate that there may be a relationship between country-level factors and the number of female directors. Japan had the lowest levels of female representation and Australia has the highest, with South Africa falling closer to Australia. When compared to the gender parity of each country, Australia scores the highest out of the three countries in both Educational Attainment and Economic Participation and Opportunity for women. South Africa scores lower than Japan in the equal Educational Attainment of women but higher in Economic Participation and Opportunity (World Economic Forum, 2018a). These results suggest that women need both education and opportunity to be fairly represented on companies' board of directors.

The aim of this study is to demonstrate empirical evidence that gender diversity at a board level is relevant to company performance. Gender diversity brings novel perspectives and contributes to enhanced strategic decision making (Nielsen & Huse, 2010), which translates into improved financial and social performance. Country-level factors do not limit the ability of women to contribute to the boardroom discussion but may limit the number of women on the board. Introducing gender diversity with one woman is enough to make a difference; however, companies are able to maximise the contribution of females when there are three or more women on the board. The optimal board structure should maximise the effectiveness of the board of directors and profitability of the company. Two important distinctions for stakeholders and shareholders are noted: 1) women make a differential contribution to company performance and 2) the number of women on the board plays a role in the contribution that female directors are able to make. Female representation on the board makes for an important business case in order to extract the best performance from the board as a whole and, in turn, the company.

Recommendations

The results of this study has highlighted that there is merit in having a gender-diverse board. Increased female representation allows for diverse expertise (Harrison & Klein, 2007), improved risk and oversight (Brown et al., 2002) contributing to more effective decision-making (Konrad et al., 2008) and improved Financial and Social Performance. Critical mass further contributes to the merit of increased female

representation. The results demonstrate that having three or more women on the board allows companies to maximise the contribution of these women to improve their financial performance. Thus, a competent recommendation is for companies to appoint a minimum of three women on the board to avoid tokenism and maximise the contribution from its female directors (Konrad et al., 2008).

The literature review has highlighted that companies that operate in countries with legislated board gender quotas, or which have recommended corporate governance practices in relation to gender parity on the board, tend to have higher levels of female representation (Terjesen et al., 2015; Yang et al., 2019). In order to promote board gender parity, government regulation (in the form of a gender quotas or corporate governance codes) requiring companies to have a certain level of female representation on the board is recommended.

This study further highlights country-level factors that may contribute to increased female representation on the board. Specifically, gender parity in terms of educational attainment and economic participation and opportunity are required to increase gender diversity on the board. The results show that education alone is not enough to increase female representation on the board, but economic participation and opportunity also need to exist to increase gender diversity on the board. A consequent recommendation is for companies to implement and support initiatives that promote the education of women and provide in-house training to upskill women. Companies should also create more opportunities for career progression and the consequent promotion of women within the company, in order to achieve gender parity at a board level.

Areas for Future Research

This study examined three countries that differ in terms of gender parity and cultural norms to determine whether country-level factors influence the impact that women have on the board. The study could be extended to include more countries with varying levels of gender parity to gain a better understanding of the influence of country-level factors on the impact on company performance through the presence of female board members.

This study also aimed to determine whether increased female representation on the board results in improved financial and non-financial performance. The study could be expanded to assess whether director positions influence the level of impact that female directors are able to have on company performance. Explained further, research could explore whether there is a different level of impact on financial and non-financial performance if the female director is an executive director or a non-executive director.

Moreover, this study examined the impact of female representation on social and environmental performance. An extension of the study could be performed by examining other areas of performance such as corporate governance and compliance.

Lastly, research has highlighted that measures of women on the board are concentrated in certain sectors (Adams & Ferreira, 2009; Grosvold et al., 2007; Joecks et al., 2013). A comparison between sectors as to whether the impact on company performance of female representation on the board is influenced by the nature of the industry could be examined.

Appendices

Appendix A

Table 7: List of companies included in the sample

	Australia: Australia Stock Exchange	Japan: Tokyo Stock Exchange	South Africa: Johannesburg Stock Exchange
1	Afterpay Touch Group Ltd	Aeon Co. Ltd	Absa Group Ltd
2	AGL Energy Ltd	ANA Holdings Inc.	AECI Ltd
3	Als Ltd	Asahi Group Holdings Ltd	African Rainbow Minerals Ltd
4	Altium Ltd	Asahi Kasei Co. Ltd	Anglo American Platinum Ltd
5	Alumina Ltd	Astellas Pharma Inc.	Anglo American Plc.
6	Amtcor Plc	Bandai Namco Holdings Inc.	AngloGold Ashanti Ltd
7	AMP Ltd	Bridgestone Co. Ltd	Anheuser-Busch InBev SA/NV
8	Ansell Ltd	Canon Inc.	Aspen Pharmacare Holdings Ltd
9	ANZ Banking Group Ltd	Central Japan Railway Co. Ltd	Assore Ltd
10	APA Group Ltd	Chugai Pharmaceutical Co. Ltd	AVI Ltd
11	Aristocrat Leisure	Dai-ichi Life Holdings Inc.	Barloworld Ltd
12	ASX Ltd	Daiichi Sankyo Co. Ltd	Bid Co.oration Ltd
13	Atlas Arteria Ltd	Daikin Industries Ltd	Brait SE
14	Aurizon Holdings Ltd	Daiwa House Industry Co. Ltd	British American Tobacco Plc.
15	Ausnet Services Ltd	Denso Co. Ltd	Capital & Counties Properties Plc.
16	Bank of Queensland	East Japan Railway Co.	Capitec Bank Holdings Ltd
17	Beach Energy Ltd	Eisai Co. Ltd	Clicks Group Ltd
18	Bendigo and Adelaide	FamilyMart Co. Ltd	Compagnie Financiere Richemont SA
19	BHP Billiton Ltd	FANUC Co. Ltd	Coronation Fund Managers Ltd
20	Bluescope Steel Ltd	Fast Retailing Co. Ltd	Curro Holdings Ltd
21	Boral Ltd	Fujitsu Ltd	Dis-Chem Pharmacies Ltd
22	Brambles Ltd	Hitachi Ltd	Discovery Ltd
23	Caltex Australia Ltd	Honda Motor Co. Ltd	Distell Group Holdings Ltd
24	Carsales.com Ltd	Hoya Co. Ltd	EPP N.V.

25	Challenger Ltd	Inpex Co. Ltd	Exxaro Resources Ltd
26	Charter Hall Group Ltd	Itochu Co. Ltd	FirstRand Ltd
27	Cimic Group Ltd	Japan Tobacco Inc.	Fortress REIT Ltd
28	Cleanaway Waste Ltd	JXTG Holdings Inc.	Glencore Plc.
29	Coca-Cola Amatil Ltd	Kansai Electric Power Co Inc.	Globe Trade Centre S.A.
30	Cochlear Ltd	Kao Co. Ltd	Gold Fields Ltd
31	Commonwealth Bank of Australia Ltd	KDDI Co. Ltd	Growthpoint Properties Ltd
32	Computershare Ltd	Keyence Co. Ltd	Hammerson Plc.
33	Crown Resorts Ltd	Kirin Holdings Co. Ltd	Harmony Gold Mining Company Ltd
34	CSL Ltd	Komatsu Ltd	Hyprop Investments Ltd
35	CYBG Plc	Kubota Co. Ltd	Impala Platinum Holdings Ltd
36	Dexus Property Group	Kyocera Co. Ltd	Imperial Holdings Ltd
37	Domino Pizza Enterprise	M3 Inc.	Intu Properties Plc.
38	Downer Edi Ltd	Marubeni Co. Ltd	Investec Ltd
39	Duluxgroup Ltd	Mitsubishi Chemical Holdings Co. Ltd	Investec Plc.
40	Evolution Mining Ltd	Mitsubishi Co. Ltd	Italtile Ltd
41	Flight Centre Travel	Mitsubishi Electric Co. Ltd	JSE Ltd
42	Fortescue Metals Group	Mitsubishi Estate Co. Ltd	KAP Industrial Holdings Ltd
43	Goodman Group	Mitsubishi Heavy Industries Ltd	Kumba Iron Ore Ltd
44	GPT Group	Mitsubishi UFJ Financial Group Inc.	Liberty Holdings Ltd
45	Iluka Resources	Mitsui & Co. Ltd	Life Healthcare Group Holdings Ltd
46	Incitec Pivot	Mitsui Fudosan Co. Ltd	Lighthouse Capital Ltd
47	Insurance Australia Group	Mizuho Financial Group Inc.	MAS Real Estate Inc..
48	James Hardie Industries Plc	MS&AD Insurance Group Holdings Inc.	Massmart Holdings Ltd
49	JB Hi-Fi Ltd	Murata Manufacturing Co. Ltd	Mediclinic International Plc.
50	Lendlease Group	Nexon Co. Ltd	MMI Holdings Ltd
51	Link Admin Holding	Nidec Co. Ltd	Mondi Ltd
52	Macquarie Group Ltd	Nintendo Co. Ltd	Montauk Holdings Ltd
53	Magellan Fin Group Ltd	Nippon Paint Holdings Co. Ltd	Mr Price Group Ltd
54	Medibank Private Ltd	Nippon Steel Co.	MTN Group Ltd
55	Mirvac Group	Nippon Telegraph & Telephone Co. Ltd	Naspers Ltd

56	National Australia Bank Ltd	Nitori Holdings Co. Ltd	Nedbank Group Ltd
57	Newcrest Mining Ltd	Nomura Holdings Inc.	NEPI Rockcastle Plc.
58	Nine Entertainment Co. Holdings Ltd	Nomura Research Institute Ltd	Netcare Ltd
59	Northern Star Ltd	NTT Data Co. Ltd	Northam Platinum Ltd
60	Oil Search Ltd	NTT DOCOMO Inc.	Old Mutual Ltd
61	Orica Ltd	Olympus Co. Ltd	Pepkor Holdings Ltd
62	Origin Energy	Omron Co. Ltd	Pick n Pay Stores Ltd
63	Orora Ltd	Oriental Land Co. Ltd/Japan	Pioneer Food Group Ltd
64	OZ Minerals Ltd	Orix Co.	PSG Group Ltd
65	Pendal Group Ltd	Otsuka Holdings Co. Ltd	PSG Konsult Ltd
66	Qantas Airways Ltd	Panasonic Co. Ltd	Quilter Plc.
67	QBE Insurance Group	Rakuten Inc.	Rand Merchant Investment Holdings Ltd
68	QUBE Holdings Ltd	Recruit Holdings Co. Ltd	RCL Foods Ltd
69	Ramsay Health Care Ltd	Secom Co. Ltd	RDI REIT Plc.
70	REA Group	Sekisui House Ltd	Redefine Properties Ltd
71	Reliance Worldwide	Seven & i Holdings Co. Ltd	Reinet Investments SCA
72	Resmed Inc.	Shimano Inc.	Remgro Ltd
73	RIO Tinto Ltd	Shin-Etsu Chemical Co. Ltd	Resilient REIT Ltd
74	Santos Ltd	Shionogi & Co. Ltd	Reunert Ltd
75	Scentre Group	Shiseido Co. Ltd	RMB Holdings Ltd
76	Seek Ltd	SMC Co. Ltd	Sanlam Ltd
77	Sonic Healthcare Ltd	SoftBank Group Co. Ltd	Santam Ltd
78	Washington H. Soul Pattinson and Co. Ltd	Sompo Holdings Inc.	Sappi Ltd
79	South32 Ltd	Sony Co. Ltd	Sasol Ltd
80	Spark Infrastructure Ltd	Subaru Co. Ltd	Shoprite Holdings Ltd
81	Stockland Ltd	Sumitomo Co. Ltd	Sibanye Gold Ltd
82	SunCo. Group Ltd	Sumitomo Mitsui Financial Group Inc.	Sirius Real Estate Ltd
83	Sydney Airport Ltd	Sumitomo Mitsui Trust Holdings Inc.	Standard Bank Group Ltd
84	TabCo. Holdings Ltd	Sumitomo Realty & Development Co. Ltd	Super Group Ltd
85	Telstra Corporation Ltd	Suntory Beverage & Food Ltd	Telkom SA SOC Ltd
86	The a2 Milk Company Ltd	Suzuki Motor Co.	The Bidvest Group Ltd
87	The Star Ent Group Ltd	Sysmex Co. Ltd	The Foschini Group Ltd

88	TPG Telecom Ltd	Takeda Pharmaceutical Co. Ltd	The SPAR Group Ltd
89	Transurban Group	TDK Co. Ltd	Tiger Brands Ltd
90	Treasury Wine Estate Ltd	Terumo Co. Ltd	Truworths International Ltd
91	Unibailrodawestfield SE	Tokio Marine Holdings Inc.	TSOGO Sun Gaming
92	Vicinity Centres Ltd	Tokyo Electron Ltd	Vivo Energy Plc.
93	Wesfarmers Ltd	Toray Industries Inc.	Vodacom Group Ltd
94	Westpac Banking Co. Ltd	Toray Industries Inc.	Vukile Property Fund Ltd
95	Whitehaven Coal Ltd	Toyota Industries Co. Ltd	Woolworths Holdings Ltd
96	Woodside Petroleum Ltd	Toyota Motor Co. Ltd	
97	Woolworths Group Ltd	Toyota Tsusho Co. Ltd	
98	Worleyparsons Ltd	Unicharm Co. Ltd	
99	Xero Ltd	West Japan Railway Co. Ltd	
100		Yahoo Japan Co. Ltd	

Appendix B

Table 8: Description of variables used.

Variable	Description
ROA	Continuous variable. Return on Assets. Percentage of net income to total assets.
ROE	Continuous variable. Return on Equity. Percentage of net income to total equity.
TQ	Continuous variable. Tobin's Q. Percentage of market value of the company over total assets.
Escore	Continuous variable. Takes a value of 1 to 12. A+ being 12, D-being 1.
Sscore	Continuous variable. Takes a value of 1 to 12. A+ being 12, D-being 1.
Percentwob	Continuous variable. Percentage of women on the board of directors.
Cm	Binary variable. Takes a value of 1 if there are three or more women on the board of directors, 0 otherwise.
Sector	Categorical variable of the company sector as per ICB sector code.
Country	Categorical variable of the country in which the company is listed.
Frf	Categorical variable of the company's financial reporting framework.
Percentwob*country	Interaction term between percentage of women on the board and the categorical country variable.
Cm*country	Interaction term between critical mass and the categorical country variable.
Lnta	Natural log of total assets.
Lev	Percentage of total liabilities over total assets
Boardsize	Number of board members

Appendix C

Table 9: Regression results for the impact of female representation on the board on Financial Performance including interaction terms.

	Test 1: Percentage of women on the board			Test 2: Critical Mass		
	ROA	ROE	Tobin's Q	ROA	ROE	Tobin's Q
Percentage of women on the board	0.072** (0.036)	0.137* (0.082)	0.021*** (0.007)			
Critical Mass				1.314* (0.785)	1.402 (1.628)	0.272 (0.202)
Industrials	0.818 (0.799)	2.277 (1.535)	0.094 (0.169)	0.789 (0.791)	1.124 (1.688)	0.097 (0.207)
Resources	-2.422 (1.816)	-7.850** (3.435)	-0.726*** (0.255)	-2.466 (1.811)	-7.694** (3.843)	-0.696*** (0.249)
Japan	2.753* (1.521)	1.793 (2.717)	0.505** (0.235)	1.522 (1.099)	0.263 (2.285)	0.298 (0.288)
South Africa	-0.46 (1.614)	-1.33 (2.919)	-0.543** (0.22)	-1.869* (1.02)	-1.624 (2.106)	-0.744*** (0.218)
JP GAAP	-0.827 (0.987)	-1.683 (1.645)	-0.180* (0.108)	-0.795 (0.986)	-2.759 (1.97)	-0.171 (0.105)
US GAAP	0.44 (1.37)	-0.799 (2.322)	-0.128 (0.094)	0.427 (1.366)	-1.044 (2.826)	-0.038 (0.094)
Percentage of women on the board x Japan	-0.062 (0.072)	-0.077 (0.143)	-0.011 (0.014)			
Percentage of women on the board x South Africa	-0.055 (0.055)	0.078 (0.127)	-0.009 (0.008)			
Critical Mass x Japan				-0.164 (3.555)	-0.020 (7.506)	-0.119 (0.197)
Critical mass x South Africa				-0.366 (1.162)	2.769 (2.421)	-0.084 (0.220)
Natural Log of Total Assets	-1.608*** (0.241)	-1.450*** (0.460)	-0.373*** (0.061)	-1.643*** (0.243)	-1.672*** (0.510)	-0.420*** (0.080)
Leverage	-0.092*** (0.019)	-0.004 (0.035)	-0.009*** (0.003)	-0.09*** (0.0192)	-0.021 (0.040)	-0.008* (0.004)

Board Size	0.133 (0.112)	0.112 (0.191)	0.005 (0.011)	0.101 (0.113)	0.106 (0.228)	<-0.001 (0.012)
Constant	19.29*** (2.404)	21.91*** (4.383)	5.157*** (0.609)	21.29*** (2.246)	28.08*** (4.752)	5.95*** (0.838)
Wald chi-squared(12)	108.45* **	43.8***	124.69***	114.05*	37.13***	80.18***
Observations	863	860	863	863	860	863
Groups	294	293	294	294	293	294

* p<0.1, ** p<0.05, *** p<0.01. The numbers without brackets presents the regression coefficients and bracketed numbers present the standard errors.

Table 10: Regression results for the impact female representation on the board for Non-financial Performance including interaction terms

	Test 1: Percentage of women on the board		Test 2: Critical Mass	
	Environmental Score	Social Score	Environmental Score	Social Score
Percentage of women on the board	0.006 (0.008)	0.016** (0.008)		
Critical Mass			-0.078 (0.143)	0.232 (0.160)
Industrials	0.337 (0.300)	0.842*** (0.280)	0.368 (0.300)	0.878*** (0.286)
Resources	0.319 (0.713)	0.552 (0.665)	0.234 (0.715)	0.566 (0.678)
Japan	0.169 (0.421)	-0.413 (0.421)	0.003 (0.358)	-0.678* (0.351)
South Africa	-0.247 (0.439)	-0.464 (0.444)	-0.099 (0.336)	-0.208 (0.329)
JP GAAP	-0.048 (0.228)	-0.967*** (0.248)	-0.038 (0.231)	-0.956*** (0.249)
US GAAP	0.412 (0.323)	-0.064 (0.35)	0.396 (0.328)	-0.095 (0.352)
Percentage of women on the board x Japan	0.003 (0.017)	-0.004 (0.018)		
Percentage of women on the board x South Africa	0.011 (0.013)	0.012 (0.013)		
Critical Mass x Japan			-0.036 (0.697)	0.206 (0.781)
Critical Mass x South Africa			0.162 (0.229)	-0.099 (0.253)
Natural Log of Total Assets	0.702*** (0.081)	0.601*** (0.079)	0.725*** (0.081)	0.617*** (0.08)
Leverage	>-0.001 (0.006)	-0.009 (0.006)	>-0.001 (0.006)	-0.009 (0.006)
Board Size	0.004 (0.027)	0.030 (0.029)	0.001 (0.027)	0.020 (0.029)

Constant	1.311 (0.815)	2.038*** (0.789)	1.301 (0.807)	2.305*** (0.785)
Wald chi-squared(12)	132.56***	105.12***	127.12***	93.65***
Observations	796	796	796	796
Groups	284	284	284	284

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The numbers without brackets present the regression coefficients and bracketed numbers present the standard errors.

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