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**WOMEN IN THE BOARDROOM AND FINANCIAL PERFORMANCE:
AN ANALYSIS OF JSE LISTED COMPANIES**

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**A dissertation submitted in partial fulfilment of the requirements for the degree of
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DECLARATION

I, Raeesa Dockrat, declare that:

- i) The research reported in this dissertation, except where otherwise indicated, is my original research.
- ii) This dissertation has not been submitted for any degree or examination at any other university.
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Date: 23 September 2022

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ABSTRACT

Despite the awareness created around gender inequality and the diverse strengths women bring to the business world, progress in gender diversity has been negligible. In South Africa, despite employment equity policies being established in 1998, after 21 years, women in post-apartheid South Africa do not occupy even close to an equal share of executive positions in business as compared to men.

This study explored the association between female representation on company boards and an organisation's financial performance. Unlike previous South African studies, this study utilized a longer period of time, from 2007 to 2016, and included a period during which gender diversity has increased in pervasiveness and there is a higher proportion of women in executive positions. The Johannesburg Stock Exchange (JSE) Top 40 listed companies were selected as the sample for this study. The data of listed companies on the JSE were sourced from the IRESS and the Bloomberg database. A dynamic linear regression model with generalized method of moments (GMM) estimation was used to conduct a robust analysis.

This study found a positive and statistically significant relationship between the accounting based financial measures (return on assets and return on equity) as well as the market-based performance measure (Tobin's Q) and board gender diversity, measured as the proportion of women on the board of directors. This implies that firms with a well gender-diversified board perform better financially. The study contributes to existing literature on whether achieving gender diversity at a board level does in fact add significant benefit to shareholders wealth and a firms' bottom line. It influences an important policy debate and will be of interest to academics and stakeholders including directors, investors, regulators and women's rights advocates.

Keywords: Board gender diversity, JSE Top 40, Financial performance, Return on assets, Return on equity, Tobin's Q

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LIST OF ACRONYMS

AR	Autoregressive
BOD	Board/s of Directors
BRICS	Brazil, Russia, India, China and South Africa
BSE	Bombay Stock Exchange
CEO	Chief Executive Officer
CSR	Corporate social responsibility
FP	Financial performance
GMM	Generalized method of moments
JSE	Johannesburg Stock Exchange
King III	King III Report on Corporate Governance for South Africa 2009
King IV	King IV Report on Corporate Governance for South Africa 2016
OLS	Ordinary least squares
REITs	Real Estate Investment Trusts
ROA	Return on assets
ROE	Return on equity
ROS	Return on sales
SSE	Shanghai Stock Exchange
VIF	Variance inflation factor

CHAPTER 1: INTRODUCTION

1.1 Background to the study

Recently, gender diversity in boardrooms across the globe has emerged as a crucial governance issue (Yasser, Al Mamun and Ahmed, 2017; Dankwano and Hassan, 2018). Globally, the average percentage of female directors in corporate boardrooms has increased by less than 1% from 2014 (14,5%) to 2015 (15,3%) and by 1,6% from 2015 to 2016 (16.9%) (d’Hoop-Azar, Martens, Papolis and Sancho, 2017). By 2021, 19.7% of board seats globally were held by women, an increase of only 2.8% since 2016. This indicates that whilst there is a positive movement in the numbers, the progress of women in corporate leadership continues to be unacceptably slow (Konigsburg and Thorne, 2022). This is despite the fact that the success of a company largely depends on its leadership, in particular the directors who are in control of shaping the company’s future and keeping it focused on its goals (Benlemlih, Shaukat and Qiu, 2018). Board structure, including diversity on the board is crucial in ensuring that the board has adequate resources, is innovative and able to make better decisions in order to effectively carry out its duties which results in improved financial performance (FP) (Ibrahim, Ouma and Koshal, 2019; Wang, 2020; Jiang, Cherian and Sial, 2021). Diversity amongst a board of directors (BOD) includes qualities such as age, race, expertise and gender (Ghauri, Mansi and Pandey, 2021). Recently, the topic of gender diversity has become increasingly popular in an attempt to address the predicament where women are underrepresented in corporate leadership.

Worldwide, the pressure on companies to address the underrepresentation of women on the BOD is intensifying. It is noteworthy that France, Norway, Italy and Belgium are the front-runners with averages between 34,9% and 43,2% of female directors, regarding all countries with national quotas implemented for all or certain listed companies (Konigsburg and Thorne, 2022). Hughes, Paxton and Krook (2017) affirmed that mandatory quota laws, which compel companies to allocate a minimum share of board seats to women, have been adopted by some countries to address the gender gap on boards. In Europe, this approach has been implemented by the Netherlands, Belgium, Finland, France and Norway and seems to be a viable initiative. This is a case in point with Norway, which prior to 2003 possessed an average of 7% of women on the board, having witnessed a significant increase as a result of the adoption of the mandatory quota system approach

(Eckbo, Nygaard and Thorburn, 2019; Bennouri, De Amicis and Falconieri, 2020). Norway, through the quota system, maintains one of the highest percentage of females on the BOD with an average of 42,4% (Konigsburg and Thorne, 2022). Countries with no quotas in place are usually at the bottom of the ranking in the promotion of women.

The most commonly recognised emerging markets, Brazil, Russia, India, China and South Africa (BRICS), have increasingly focused on promoting women to senior corporate positions; however, progress has still been abominable. Konigsburg and Thorne (2022) noted that Brazil, Russia and China had an average of 10,4%, 10% and 13,1% respectively of their board seats held by women. Of the BRICS countries, South Africa leads the way with an average of 31,8% female directors, ranking even higher than the United Kingdom and the United States of America, showing that the country has recently made significant progress which surpasses even developed economies. India has more than doubled the proportion of females on corporate boards from 7.7% to 17,1% over the period 2014 to 2021. They achieved these results through amendments to The Indian Companies Act, 2013 (Act No. 18), which legislates that company boards must have at least one female representative (Sahoo, 2021).

When reflecting on Africa, according Navitidad (2015) who conducted a study of 307 eminent African companies, one-third of these companies had no female directors and, on average, only one in seven board members were female. Sotola (2019), in an analysis of women's representation in selected African countries between the years 2016 and 2019, found that there are considerable variations in female board representation across African countries. In particular, the study found that South Africa possessed the highest female board membership, while Côte d'Ivoire had the lowest. South Africa, together with other African countries such as Nigeria, Rwanda and Kenya, promotes the adoption of policies that support women's leadership; however, a key obstacle is that the mechanisms to enforce these laws as well as penalties for non-compliance are nearly non-existent (Sotola, 2019).

Whilst the South African population was made up 51.2% of women in 2017, when considering the companies listed on the JSE, women accounted for a mere 20.7% of board members (Bosch, van de Linde and Barit, 2020). It is clear that despite the Constitutional imperatives of South Africa,

men still continue to occupy the majority of positions on the BOD. Notwithstanding the national narrative on promotion of women in the workplace, the progress specifically regarding women on the BOD is still minimal (Scheepers, Douman and Moodley, 2018). For most of the decade since 2010, only two women headed up large listed companies in South Africa. However, as of January 2022, after two new appointments, the country reached its record number of four women occupying the position of Chief Executive Officer (CEO) across the Top 40 companies listed on the Johannesburg Stock Exchange (JSE) (Whitfield, 2021). The most recent appointments were Bertina Engelbrecht at Clicks and Nompumelelo Zikalala at Anglo American's Kumba Iron Ore, both in 2022. With the appointment of Nompumelelo Zikalala, there are now two female CEOs in Anglo American, the first being Natascha Viljoen who was appointed as CEO of Anglo-American Platinum in 2020. Another noteworthy appointment was that of Nompumelelo Thembekile Madisa, who was promoted to CEO of the Bidvest Group in 2019. There are only two other JSE-listed companies, which are not included in the index of the country's largest companies, which are run by women. Whilst these appointments were a much-needed advancement for the country with regards to enhancing gender diversification, female representation across the directors of South African companies remains inexcusable and these statistics are reflective of the historical disadvantages that women have experienced.

To address the historical disadvantages faced by women in South Africa, numerous laws and policies continue to focus on the representation of women in corporate boardrooms across the country (Matotoka and Odeku, 2021). An early laudable initiative was the Commission for Gender Equality, which was founded in 1996 to assess the degree to which policies in both the government and private sectors encourage gender equality. The Commission further evaluates relevant legislation, provides parliament with recommendations and scrutinises complaints regarding gender discrimination.

In a more recent effort to attain diversity in the boardroom, the country's King IV Report on Corporate Governance for South Africa 2016 (King IV), advises that companies should establish targets to achieve gender diversity at board level and must annually account for the developments made towards this target in the company statements. This subsequently witnessed the articulation of updated JSE listing requirements for companies to implement their gender policies and disclose

the relevant statistics (King Committee on Corporate Governance, 2016). Mans-Kemp and Viviers (2019) found that only 10% of the JSE companies scrutinised had gender parity (50% female board representation) and not all companies listed had complied with the updated reporting requirements.

1.2 Problem statement

Despite the global awareness created around gender inequality through academic research, the media and government regulations, progress in gender diversity has been negligible (Reddy and Jadhav, 2019; Nguyen, Tran and Truong, 2021). From a South African perspective in particular, although the government has embarked on initiatives to address historical challenges, there is still much room for continued development. Women in post-apartheid South Africa do not occupy even close to an equal share of powerful positions in business as compared to men.

Of particular interest, not only to directors but also investors, regulators, women advocacy groups and other stakeholders, is whether achieving gender diversity at a board level does in fact add significant benefit to investors' wealth and an entity's bottom line. Results from existing studies which analyse gender diversity and corporate performance are inconsistent. Temile, Jatmiko and Hidayat (2018) favoured diversity as they found it leads to companies having a competitive advantage. This advantage can be seen in the form of better firm profitability as a result of women being able to propose strategies which infiltrate certain markets better because they are more aware and representative of the customer base (Fernández-Temprano and Tejerina-Gaite, 2020). Additionally, FP is increased through gender diversity as a result of increased knowledge and innovation. Riyadh, Sukoharsono and Alfaiza (2019) viewed corporate gender diversity as valuable for businesses as it leads to greater profits and returns. Further, some researchers have argued that including women on the BOD improves its efficacy and in turn improves FP (Giraldez-Puig and Berenguer, 2018; Ibrahim et al., 2019; Duppati, Rao and Matlani, 2020; Jiang et al., 2021). Likewise, Singh, Kota and Sardana (2021) have linked this improved performance to the valuable traits possessed by women such as better insight into diverse customer needs, the ability to innovate and an increased sense of moral obligation when making company decisions. They added that these traits further promote boardroom transparency which decreases the likelihood of corporate scandals.

Sceptics, however, consider diversity to create conflicts in a business and hence be a limitation to corporate performance (Valls Martínez, Martin Cervantes and Cruz Rambaud, 2020). Herrera-Cano and Gonzalez-Perez (2019) showed that if women are merely appointed as directors to conform to legal regulations or pressure from society, then there may be no value added to the company as these females will be ostracised by the males in leadership positions. Furthermore, Zheng, Kark and Meister (2018) explained that the role of a director may not be a traditional one for females and this may lead to female directors acting in a manner similar to that of their male counterparts, in effect not utilising their potential to enhance FP.

Finally, other research papers concluded that gender diversity and corporate performance are not significantly associated (Dankwano and Hassan, 2018; Ali, Sial and Brungi, 2020; Ajaz, Shenbei and Sarfraz, 2020; Musa, 2020).

The fact that women bring diverse strengths, perspectives and advancements to the business world is undoubtable (Duppatti et al., 2020; Wang, 2020; Jiang et al., 2021). However, an understanding of the association between boards with adequate female directors and an organisation's FP is sought after. This relationship is important to various stakeholders when considering whether or not more corporate leadership positions should be allocated to women (Cook and Glass, 2018; Arvate, Galilea and Todescat, 2018).

This investigation, unlike previous studies conducted in South Africa such as Lehobo (2011) and Dolamo (2017), used a longer period of time and included a period during which gender diversity has increased in pervasiveness and there is a higher proportion of women in senior positions.

1.3 Research question and objectives for the study

Following the substantial support for the inclusion of women in leading positions, the following research question emerged:

How, in a South African context, does female representation on the BOD relate to firm performance for JSE-listed companies?

Flowing from the research question, this study aimed to address the following research objectives:

1. Determine whether there is a relationship between female representation on the BOD and company FP.
2. Determine what proportion of female directors, if any, is required on a board to enhance the FP of JSE-listed companies.

1.4 Significance of the study

This study adds to the increasing literature on regarding the impact, if any, that greater female representation on the BOD has on FP. In particular, the study provides more recent empirical evidence on the effect that female directors have, particularly in JSE-listed entities. It has aimed to overcome some of the confines of existing research such as observations over a short-term period which weaken the findings of previous research conducted on board gender diversity and corporate FP. South African studies such as Mathur-Helm (2006) and Lehobo (2011) were conducted utilising periods relatively close to the end of the apartheid-era, which did not allow for a sufficient period in which to see the effects of the government's employment equity policies. In recent years, more South African women have been seen to fill leading business positions, highlighting the need for the topic to be revisited.

Although the results of this study will attract the attention of various stakeholders including investors, regulators and women's rights groups, it will also draw the attention of directors who abide by the principles of good corporate governance. Corporations who wish to increase their competitive edge and FP will be motivated to recruit and empower suitably qualified women. This will also result in women in lower level positions being motivated to perform their jobs more effectively. Not only will this enhance the South African skilled labour force, but, by associating the influence of women with the FP of a company, shareholders have added information at their disposal for analysis purposes. Intangible benefits brought by women to the corporate world is significant enough to call for their empowerment. Findings regarding corporate FP will offer South African corporations further valuable and practical insights.

1.5 Scope of the study

This study considered JSE-listed companies. In particular, it investigated the Top 40 companies ranked by market capitalisation in 2017. These companies are of great public interest and frequently analysed on financial platforms. More than 80% of the JSE's entire market capitalisation is represented by this index, hence it is considered a reasonable measure (Johannesburg Stock Exchange, 2013; van Zijl and Hewlett, 2022). Analysing the Top 40 companies has been supported in literature by many authors such as Malola and Maroun (2019); Van der Ventel (2020); Moloi, Nharo and Hlobo (2021) and van Zijl and Hewlett (2022). This investigation used panel data of the Top 40 companies covering a ten-year period. The chosen period for purposes of this study was 2007 to 2016, indicating that the investigation was conducted on data 14 years following the end of apartheid in South Africa. This provides a reasonable period of time since the governments' implementation of the employment equity policies in 1998.

1.6 Outline of the research dissertation

The chapters for this research study are structured as follows:

- ***Chapter 1: Introduction***

This chapter provided a critical background relating to the issue of corporate gender diversity and FP from a South African perspective. The chapter highlighted the research problem, aim of the study, research question and objectives, as well as the significance of the study. Finally, the chapter provided an overview of the scope of the study, as well as an outline of the remaining chapters.

- ***Chapter 2: Literature Review***

This chapter evaluates previous research on gender diversity and financial profitability. The confines of previous studies which were explored to fill the gap with this research are discussed. The review includes both theoretical literature which provides the main theories on the subject, as well as empirical literature which represents the contemporary studies on the subject matter.

- ***Chapter 3: Research Methodology***

This chapter details the methodology used in the study. The discussion in this chapter is structured around issues such as population sampling, measurement of variables and statistical methods.

- ***Chapter 4: Presentation of Findings***

This chapter presents the findings of the data analysis. Herein, the chapter evaluates the extent and implication of the research findings vis-à-vis the findings of other research studies.

- ***Chapter 5: Summary and Conclusion***

Chapter five presents a summary of the significant findings of this research and the way forward. In addition to this, the chapter includes limitations of the study and highlights some recommendations for future areas of research.

1.7 Chapter summary

This chapter has presented the context and motivation for the study. The research problem which was addressed when conducting the analysis was presented together with the aim and objectives of this study. Furthermore, justification for the research inquiry as well as the investigation period was duly noted. The next chapter of this study presents an evaluation of existing relevant theoretical and empirical literature.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In the first chapter, the research objective of whether greater female representation on the BOD results in improved FP on the JSE, was identified. In particular, the chapter outlined the aim to investigate whether there is a link between female directors and FP; and to determine what proportion of women, if any, is required on a board to enhance a company's FP.

This chapter reviews previous pertinent research on gender diversity and company profitability. This chapter commences by discussing the theoretical reasons why female directors should be included on company boards. The question of why women have such a low representation on boards is then tackled by reviewing impediments which hinder their progression. The chapter then continues by considering strategies to counteract the impediments and enhance gender diversification. Finally, the chapter concludes by examining empirical evidence, both international and South African, showing the relationship between female directors and profitability of entities.

2.2 The need for the inclusion of women on the BOD

The relationship between female directors and FP is a complex one as evidenced by the mixed findings in existing literature (Ahern and Dittmar, 2012; Dezsö and Ross, 2012; Abdullah, Ku Ismail and Nachum, 2016). To better understand this complexity as well as why there is a need for women to be on the BOD, the theories which are commonly utilised in this area of research are presented next.

2.2.1 Value maximisation through the inclusion of women on the BOD

Value maximisation theory, also known as shareholder value maximisation theory, is a foundational theory in commerce, finance, business and economics that suggests that the primary mission and sole purpose of establishing a business is to provide maximum value to its shareholders as measured via dividend paid and share price appreciation over time (Corelli, 2018). This theory proposes that since shareholders, unlike other stakeholders affiliated to the business, are the main contributors of capital and bearers of risks, they deserve to be well compensated for

both the provision of capital as well as bearing of the risks associated with the company's existence (Brusov, Filatova and Orekhova, 2018).

Based on over 200 years of research in the economics and the financial disciplines, authors have presented a compelling argument that society's benefit is maximised when the total market value of individual companies is maximised (Fanti and Buccella, 2017). Given that a company's primary objective is to maximise shareholder value, companies would consider the inclusion of women on boards if they believed there to be any potential gain (Noland, Moran and Kotschwar, 2016).

The BOD is considered to serve numerous functions including overseeing the business, providing significant insight into risks, monitoring compliance with regulations, setting the best leadership example of work ethic and enhancing shareholder value (Herrera-Echeverri, Gaitan, Antonio Orozco and Soto-Echeverry, 2018). Diversity is one of the most successful ways to heighten board performance. Board diversity, defined as the extent of racial and gender representation, has continued to create widespread interest especially in relation to the debate over good corporate governance (Dadanlar and Abebe, 2020). Gender diversity receives the most attention globally, as racial groups are not generalised across all countries. Ensuring a gender diverse BOD can become a competitive advantage and a means of improving company value (Nekhili, Nagati and Chtioui, 2017).

In 2017, consulting company, Catalyst, confirmed that having gender diverse boards is significantly valuable (Catalyst, 2017). To generate productive solutions for a business, constructive debates by board members are required. Gender diversity is theorised to be one of the best promoters of such a debate (Ahmad, Naveed and Fazal, 2018). Hence, companies with a primary objective to maximise wealth may certainly benefit from the inclusion of women on the BOD. Creating long-term value is core goal of the BOD and by increasing the number of female directors, the company indicates that it supports fair opportunities for career progress for current and future female employees (Hillman, Nicholson and Shropshire, 2008). This results in the company being able to retain access to a wider pool of qualified employees. Gender diverse BODs fulfil their tasks more efficiently. Women bring essential leadership qualities and skills to the boardroom, improve the decision-making process, increase risk awareness and are more likely to

engage in high-quality analysis. Gender diverse boards are also better at monitoring the company; they hold more board meetings, have higher attendance rates, and are more likely to replace a CEO when stock performance is poor (Adams and Ferreira; 2009). Shareholder value maximisation is the long-run objective of companies, and the benefit that female directors bring to an organisation can be appreciated in the long-run.

2.2.2 Female directors and the agency theory

The agency theory is a fundamental theory in commerce, finance, business law and economics that arises as a result of the view that a corporate institution is a distinct legal entity that is separate from the owners, and capable of appointing corporate officers known as the management to administer the business on behalf of its owners (De Matos, 2018). Brigham and Daves (2018) explained that agency theory relates to circumstances where one party (“the agent”) is appointed to act on behalf of another party (“the principal”) to undertake business activities in exchange for an allocated remuneration. Therefore, this theory explains the relationship between individuals with different goals who form part of one organisation.

Agency theorists suggest that the conflicting goals between shareholders and managers may lead to agency problems as shareholders are likely to delegate the task of making strategic decisions to managers (Jensen and Meckling, 1976; Bussin, 2015). The agent’s actions may be in their personal best interest which may not align with the best interest of the principal. This could, therefore, result in the principal’s profits and the value of the organisation being compromised. To mitigate this problem, shareholders aim to implement additional control mechanisms to monitor managers and reduce agency costs. The inclusion of women on a board is perceived to be one such mechanism used to supervise and maintain control of activities undertaken by the board, as this inclusion increases board independence (Pucheta-Martínez, Bel-Oms and Olcina-Sempere, 2018). The extensive opinions and views shared by a diverse BOD is seen to increase board independence (Katmon, Mohamad and Norwani, 2019). Female directors are considered to have achieved high-level qualifications and to be very professional (Paoloni, Coluccia and Fontana, 2019). Further, boards without female directors could be an indication that the appointment of directors was biased and that stakeholders cannot be satisfied that the directors are in fact independent from management (Terjesen, Couto, and Francisco, 2016). Boards with greater independence are more

effective which leads to a positive influence on company performance (Tulung and Ramdani, 2018).

It is maintained that one solution to reduce the agency costs is for directors to strengthen their monitoring responsibilities. Effective monitoring by the BOD is required to alleviate these disagreements within a company. Improving board monitoring ultimately results in improved FP (Isidro and Sobral, 2015). Saona, Muro and Alvarado (2020) have indicated that women are better at monitoring activities as they call for more audits and accountability from managers. Directors of differing genders may pose different questions and bring new perspectives, resulting in reduced agency costs and, in-turn, increase company value (Pucheta-Martínez et al., 2018).

Agency theory advocates that women are able to assess complex issues from a unique perspective, and this greatly assists in problem solving. Agency problems usually arise when managers do not have shareholders' best interest in mind, however a more gender-diverse board demands more audit efforts and managerial accountability. Women have greater levels of public disclosure which further indicates accountability and transparency. This, together with the ability to have better oversight of management is an indication that female directors have goals which are aligned with the shareholders of a company.

2.2.3 The positive influence of female directors from the perspective of resource-dependency

The resource-dependency theory is a pivotal theory in the commerce and finance-related fields that considers the behaviour, approach and several tactics and strategies that a corporate institution employs when it relates with its external stakeholders in the course of its business activities (Lenox and Chatterji, 2018). According to the resource dependency theory, for companies to thrive, they need to trade and obtain resources which establishes a sense of reliance between companies and third parties (Ali, Ng and Kulik, 2014). The theory suggests that the company's board connects them to external parties (Hamdan, 2018). The result of a gender diverse board is a significant addition of varied skills and networking opportunities for the company (Lu and Herremans, 2019). Gender diversity improves the relationship between the company and its female stakeholders (Bravo and Reguera-Alvarado, 2019). As a result of the more diverse networks which female

directors belong to, they have the ability to expand a company's access to essential resources, hence improving FP (Bravo and Reguera-Alvarado, 2019).

Gender diversity improves the decision-making process of the BOD by offering extensive expertise as well as knowledge. Further, it contributes to accessing unique resources that are critical to the company's success and can improve the problem-solving capability of the BOD (Katmon et al., 2019). Reddy and Jadhav (2019) likewise agree that this theory infers that gender diversity in the boardroom results in enhanced information due to the uniqueness of its source. The theory suggests that directors are appointed for the purpose of obtaining access to crucial resources and connections which enriches a company's performance (Hussain, Rigoni and Cavezzali, 2018). Female directors are selected based on their familiarity with competitors and customers (Rose, Munch-Madsen and Funch, 2013) as well as their industry expertise and possibly greater access to finance (Carrasco, Francoeur and Labelle, 2015). The main advantage identified when appointing female directors is that it provides the company with valuable information and expands the company's network (Zenou, 2018).

Specifically, this theory explains why female directors are often found in customer-oriented businesses, as gender diversity improves stakeholder relationships as well as the reputation and financial results of companies (Dang and Nguyen, 2016). Including women in the boardroom improves the perception of a company by indicating that they promote gender parity (Isidro and Sobral, 2015). This conveys positive signals to stakeholders, particularly financiers, consumers and society (Zenou, 2018). Agency and resource-dependency theories both affirm the influence that female directors have on boards making sounder financial and non-financial decisions.

In the next section, some of the impediments which hinder the progress of women in corporate leadership are reviewed.

2.3 Impediments which hinder corporate gender diversity

Despite the clear need for the inclusion of female directors as described in the preceding section, and the global awareness created around gender inequality through academic research, the media and government regulations, there are still various impediments which hinder the progression of women and subsequently lead to the lack of diversity (Reddy and Jadhav, 2019; Nguyen et al.,

2021). Amongst other impediments, the glass ceiling effect, tokenism and skills shortages faced by companies are discussed below.

2.3.1 The glass ceiling effect

The ‘glass ceiling effect’ is commonly used to describe the difficulties confronted by women in ascending the corporate ladder. The term was introduced as early as 1986 in the Wall Street Journal and was described as unseen barriers that hinder and limit the rise and progression of women on the corporate ladder. Several studies have used the term to describe inherent and systemic obstacles that women often encounter in their quest to advance and attain higher corporate positions and roles such as directorships and board executives (Mun and Jung, 2018; Lewellyn and Muller-Kahle, 2020).

The glass ceiling effect exists at both the top-level corporate position as well as at entry-level corporate positions. Recent reports from Statistics South Africa for the second quarter of 2021 noted that women occupy only 33.1% of managerial positions in South African corporations (Statistics South Africa, 2021). This assertion was further confirmed in a survey of approximately 800 Japanese companies over a ten-year period (Mun and Jung, 2018). While the study further noted improvement of diversity at the executive level, it was found that there is an increasing glass ceiling effect at the bottom level for non-managerial and entry-level female staffers. This trend has raised concerns for the emergence and existence of ‘queen bees’, females who when they reach the height of their careers are unwilling to support and enable other women to succeed, which impedes the advancement of women (Viviers, Mans-Kemp and Fawcett, 2017; Sotola, 2019).

2.3.2 Tokenism and stereotyping

The term ‘token’ refers to a woman who is the sole representative of her gender, one who was appointed merely to show non-discrimination towards women (Sotola, 2019). When used in the context of business, it emphasizes the absence of women in top management roles. These ‘token’ women are deprived of possessing executive rights to make decisions and are appointed merely as a means of compliance with legislative requirements (Low, Roberts and Whiting, 2015). This creates a negative perception as the solo woman is seen for her feminine qualities rather than her

leadership qualities. Furthermore, this has a negative impact on the effectiveness of the tasks performed by the female director (Liu, Wei and Xie, 2014).

As a result of tokenism in corporate institutions, female directors and executives are often stereotyped based on their gender characteristics, and are easily subjected to negative profiling, such as women do not have the necessary traits to hold leadership positions (Tabassum and Nayak, 2021). Women then face the fear of being criticised for engaging in something that may confirm the negative stereotype. Based on the token status and gender stereotypes, a female director who is treated as a mere ‘token’ by stakeholders will most likely have a limited impact on company decisions (Cho, Kim and You, 2021). In such instances, no improvement in FP can be expected from the inclusion of a female director.

Another societal stereotype which exists is that, compared to men, women tend to be more preoccupied, less ambitious and miss more days of work (Luo and Chui, 2018). This may stem from the fact that child and elder care are amongst the multiple roles women usually assume. This favours the promotion of men in the workplace as they are not viewed as having responsibilities outside of work. It has been argued that women wilfully choose to not be career-driven as they often struggle to achieve the optimal balance between work and personal life. Lehdonvirta (2018) reported that women are of the opinion that information about the possibility of flexible working hours and job sharing is not readily available. This suggests to women that organisations are reluctant to support women with dependents in advancing with their careers.

In addition to society’s stereotyping of women, negative stereotyping by lower-level employees is another reason why females may not reach top management levels (Bogers, Foss and Lyngsie, 2018). Top management, which includes the BOD, president, vice-president, and CEO, represents the strategic direction, values and credibility of an organisation. As such, lower-level employees form expectations of these individuals and are typically comfortable witnessing conventional male-dominated top management teams (Bonet, Cappelli and Hamori, 2020).

As a result of women in ‘token’ positions and being negatively stereotyped by society and lower-level employees, most women tend to be conservative when seeking career advancement and avoid

intentionally contending for promotions in the workplace (Rajeh, Nicolau and Qutob, 2019). One study which interviewed both male and female employees to analyse the promotion process and to establish whether it disadvantaged females, found that career progression is viewed as largely self-managed (Kumra and Vinnicombe, 2008). It became evident that women are not as comfortable as men in proactively marketing themselves. Women fear that self-promoting may appear to be too vigorous and unfeminine, as it is a quality which is traditionally less associated with women (Rajeh et al., 2019).

“One is a token, two is a presence, and three is a voice” (Kristie, 2011:22). The statement explains the critical mass theory, which proposes that as more female directors are appointed, they become more accepted, thus overcoming issues around tokenism and negative stereotypes. As a result, they can influence the discussions in the boardroom more significantly (Wiley and Monllor-Tormos, 2018; Amorelli and García-Sánchez, 2020). Once women have more of an impact in the boardroom, they have the ability to impact FP (Liu et al., 2014).

2.3.3 Shortage of skilled women for executive positions

When asked about why corporate boards are dominated by men, many companies have often cited that there is a lack of women holding appropriate qualifications available to fill senior level positions (Fine, Sojo Monzon and Lawford-Smith, 2020). While recent statistics have shown that only 6% of South African adults have a university degree, it is women who hold 52,3% of the degrees and men who hold the minority of 47,7% (Khuluvhe and Negogogo, 2021). There is a negative perception held by male corporate leaders that women are unqualified for board positions. As such, women are not offered the similar rewards such as training and development, promotions and equal salaries when compared to men (Fine, Sojo Monzon and Lawford-Smith, 2020). Terjesen, Sealy and Singh (2009) challenged this assumption in their study, stating that women almost certainly possess more than the required education and proficiency. Although the qualifications and experience held by women may be different to that of their male counterparts, they are still able to add significant value to boards.

The impediments discussed above lead to significant hurdles in achieving gender diverse boards, hence limiting the possibility of improving FP through the inclusion of women in the boardroom.

2.4 Key drivers and methods to enhance gender equality

In recent times, the impediments which hinder the progression of women to senior positions have started receiving attention. There have been increasing calls for gender diversity at corporate board levels (Bonet et al., 2020). This is because a gender diverse board is crucial for more reasons than purely FP. For instance, a gender balanced board is perceived by stakeholders as an indicator of upright ethical standards which positively influences the board's effectiveness and FP. Additionally, selecting directors regardless of gender allows access to the all-inclusive human resource pool which will lead to an innovative nation with a better competitive edge (Dormehl, 2012). Diversity needs to be actively encouraged as having a gender diverse team can offer the required extent of qualifications and skills to a company working towards advancement (Chanland and Murphy, 2018). Female directors not only act as mentors but also as a symbol of inspiration for other females (Terjesen et al., 2009; Calinaud, Kokkranikal and Gebbels, 2021). This section presents some of the key drivers and methods used in various countries to improve gender parity so that these benefits may be achieved.

According to Chapple and Humphrey (2014), market regulators have taken two approaches to promote gender diversity at board level. One approach is to impose gender quotas on boards, while the other is simply to provide companies with recommendations in respect of good governance and disclosure requirements regarding their gender diversity profiles. The recommendation includes creating policies which detail measurable objectives for achieving and sustaining gender diversity. Whilst developing a company's policies, consideration should be given to the challenges faced by women in establishing a work-life balance. Formal policies regarding matters such as flexible working arrangements and family responsibility leave should be implemented as well as establishing a culture that is supportive of female parents (Seierstad and Kirton, 2015).

With regards to gender quotas, the European Commission committed to improve the gender balance in leadership roles, specifically requiring listed companies to comprise of a minimum of 40% of female directors (García-Izquierdo, Fernández-Méndez and Arrondo-García, 2018).

Scandinavian countries have been the forerunners with regards to the implementation of a quota system. As early as 2003, Norway approved a law requiring boards of listed entities to have a

minimum of minimum of 40% of female directors (Eckbo et al., 2019; Bennouri et al., 2020). It is no surprise that the country is ranked highly with regards to the promotion of women, with an average of 42,4% female directors (Konigsburg and Thorne, 2022). Belgium, France, Germany, Iceland, India, Italy and Spain are amongst the countries that use the quota system in some form to advance board gender diversity in listed companies (García-Izquierdo et al., 2018).

By comparison, Spain uses the softer recommendations approach, by proposing to companies that female directors should account for at least 30% of the boardroom in listed companies. In 2017 all companies on the Iberian Index 35, the 35 largest companies listed on Spain's principle stock exchange, had at least one woman on their boards and female representation increased from 19.1% to 21.8% between 2016 and 2017 across all companies in this index (García-Izquierdo et al., 2018).

In Africa, the Southern African Development Community has undertaken to achieve gender equality in all senior positions of organisations. Dormehl (2012), in the Business Women's Association Census, explained that empowering and educating women and completely utilising their skills and leadership in the economy are fundamental elements to succeeding in the present environment.

In the South African context, Viviers et al. (2017) detailed various important initiatives to address gender disparities at senior management levels. The South African government commenced with voluntary initiatives to enable women and promote gender parity. The 2013 'National Women Empowerment and Gender Equity Bill', which required a minimum of 50% of women on public and privately designated boards, was subsequently withdrawn in 2014 (Viviers et al., 2017). The withdrawal was as a result of the 50% target being criticised for being idealistic and unachievable (Moloi et al., 2021). Critics argued that rather than enforcing a quota which could lead to tokenism, the government should address the underlying issues which contribute to gender inequality such as the failing education system and rigid employment policies (Steward, 2014). Currently, in South Africa, the only legislation that partly encourages the involvement of women of colour in company leadership structures is the Broad-Based Black Economic Empowerment Act 53 of 2003.

In addition to the above legislation, King IV, which defines what governance in South African corporates should entail, serves to encourage diversity at a board level. It recommends that, to

achieve better corporate governance, a board should consist of directors who have a range of skills and experiences relevant to the company and who are able to exercise independent thinking. Moreover, it indicates that the optimum board is be made up of both males and females (King Committee on Corporate Governance, 2016). As of 1 January 2017, it is mandatory for entities listed on the JSE to develop a policy on board gender diversity and to disclose their development annually (Johannesburg Stock Exchange, 2021).

Overall, South Africa has been praised for the legislative procedures relating to the general upliftment of women, such as the Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000, the Employment Equity Act 55 of 1998 and the Constitution of the Republic of South Africa, 1996. Whilst these procedures do not focus on leadership positions, they have brought some improvement. It is however evident that government, corporations, society and women in particular all need to be committed to executing these procedures in practice in order to achieve gender equality (Scholtz and Kieviet, 2018).

2.5 Review of recent empirical literature

2.5.1 Studies that found a positive relationship between women in the boardroom and FP

Gender diversity in corporate institutions is a topical issue that has drawn considerable attention of researchers and scholars. Hence, it is no surprise that several studies have inquired on the plausible association between women on the BOD and its subsequent impact on FP. Based on this investigation, several recent empirical studies identified a positive association linking women at the helm of corporate leadership and FP of such companies.

To begin, in terms of South African studies, Lehobo (2011) conducted one of the first studies in the country to conclude on the significant correlation between gender diverse BODs' and profitability. Lehobo (2011) utilised data from the top 100 JSE-listed companies over a five-year period (2004 to 2008). The author included the proportion of female directors as the independent variable and ROE, ROA and ROS as the dependent variables. Through statistical data analysis, correlation and regression analysis, it was ascertained that having a higher number of female directors leads to better company profitability.

Likewise, Matlala (2011) employed a descriptive comparative method to study board gender diversity in South Africa over an eight-year period from 2003 to 2010. The author compared the FP of companies with gender diverse boards, which were defined as boards with 25% or more of female directors, with the FP of companies whose boards were not gender diverse. FP was measured using return on assets (ROA), return on equity (ROE) and Tobin's Q. Based on the results of the comparison, the author suggested that companies with 25% or more female directors achieve better financial results than those companies whose boards are made up of less than 25% of women. Whilst this study makes a business case for board gender diversity, the author explained that the real value is added when the correct balance of men and women is reached. Likewise, Campbell and Minguez-Vera (2008) affirmed that only with the correct balance can the distinctive ideas and logic which women bring to the boardroom add value.

A study conducted by Gyapong, Monem and Hu (2016), which used data covering a six-year period (2008 to 2013) of 245 listed South African companies, recorded that the inclusion of women on a BOD significantly and positively influences company profitability. A fixed effects regression model was used which measured gender diversity as the percentage of female directors and FP using Tobin's Q.

A more recent South African analysis completed by Scholtz and Kieviet (2018) confirmed that a gender diverse board contributes positively to the financial standing of companies. The research included the top JSE 100 companies and covered only three reporting periods, 2013 to 2015. An ordinary least squares (OLS) model was applied to investigate the relationship between gender diversity (measured as the proportion of female directors on the board) and FP (measured as ROA and Tobin's Q). The analysis concluded that the relationship is positive as a result of the competitive advantage which female directors bring to a company because of their knowledge and creativity. Furthermore, larger South African companies exhibited greater gender diversity in their boardrooms and better FP than smaller companies which led to the assumption that the better performance could be because of the more diverse boards.

From another African country's perspective, Ibrahim et al. (2019) studied gender diversity in corporate board structures and the impact of this on profitability of financial services entities in

Kenya. Using this sector as the focal point of the research study, a mixed methods research methodology was adopted using questionnaires as well as secondary data from financial statements to descriptively study whether there is a link between gender diversity and FP. Results suggested that increased female representation positively effects both the ROA and ROE of insurance entities in Kenya.

There are considerably more international studies presented on the topic which support that female directors positively influence company profit. Liu et al. (2014) analysed entities listed in China from 1999 to 2011, a 13-year duration, utilising fixed effects regression analysis as a means of evaluating the relation between gender diverse boards and profitability. The study utilised both the percentage of women on the BOD and the number of women on the boards to measure gender diversity. Company performance was evaluated using return on sales (ROS) and ROA. Yet again, these authors reported a positive impact. Female directors create the perception that the board will operate more productively possibly because of the anticipation that women bring key proficiencies.

Kılıç and Kuzey (2016) used instrumental variables regression analysis as a method of investigating the impact that a gender diverse board has on profitability in Turkish companies. The study covered a five-year period from 2008 to 2012 and the sample was made up of 149 companies included on the Borsa, the Istanbul stock exchange. ROA, ROE and ROS were used as accounting measures of performance and the proxy for gender diversity was the proportion of female directors. It was concluded that currently companies are male-dominated even though the inclusion of women on the BOD positively influences profitability.

A study conducted by Terjesen et al. (2016) across 47 countries utilised data from 3 876 public companies and determined that the entities with gender diverse BOD performed better financially. The hypothesis was tested using the generalized method of moments (GMM) regression and measured company profitability using ROA and Tobin's Q. Gender diversity was quantified using the percentage of female directors.

Giraldez-Puig and Berenguer (2018) in a study based on family-owned companies in Spain, found a positive association between women on the BOD and the FP of such companies, measured using

ROA. This was noted in a study that observed 3 073 family-owned companies using the GMM panel data analysis methodology. The research outcome further implies that there is a plausible positive effect when women are given more participatory roles in the leadership of family-owned businesses.

Schrand, Ascherl and Schaefer (2018) conducted a research study in the United States of America investigating how gender diversity impacts the FP of Real Estate Investment Trusts (REITs). This study applied the two-stage Heckman methodology to a dataset of 112 US Equity REITs and noted that having women in executive positions positively improves the market performance as measured by price per net asset value of REITs. The study further noted that the likelihood of having women on boards strongly depends on board attributes, as it was widely observed that investors in particular are in favour of gender diversity as it enhanced internal controls and monitoring. This implies that it is probable that an increase in women on corporate boards improves public perception from a financial and investment markets' perspective.

Sial, Zheng and Cherian (2018) questioned if corporate social responsibility (CSR) mediates the relationship between profitability of companies and gender diversity on the BOD. The study utilised the pooled OLS regression model and observed 4 257 firm-years over an eight-year period from 2008 to 2015. All companies included in the sample were listed on the Shanghai Stock Exchange (SSE). It was determined that gender diversity on the BOD of Chinese companies significantly and positively impacts FP. Based on these research findings, the researchers suggested that policy makers and regulators should promote diversity in corporate boardrooms to ensure the sustainable growth of Chinese listed companies.

In support of the view that women have the capabilities and skills to be better directors than men, Pucheta-Martinez et al. (2018) determined that gender diverse boards drive greater FP. The authors reviewed a selection of articles from academic literature published during the period 1975 to 2017 to support the attributes of female directors which leads to the improved FP. Women create a comfortable atmosphere which encourages innovation and female directors coerce the board to consider all possible alternatives and consequences when making decisions. Women in leadership are associated with characteristics such as being highly inclusive, effective at communication and

a willingness to share information (Lyngsie and Foss, 2017). Furthermore, being responsible for the majority of consumer spending, women are more responsive to customer needs (Viviers et al., 2017). These attributes contribute to the improvement in board efficiency and ultimately improve FP, hence more companies now support the business case for female directors.

Using a panel regression, Ali et al. (2020) examined how CSR facilitates the connection between gender diversity and profitability. 3 400 listed Chinese firms from the SSE were analysed over a ten-year period, from 2009 to 2018. The research study discovered that board gender diversity improves the profitability of entities on the Chinese SSE. Additionally, it was observed that the CSR positively facilitates the link between gender diversity on a BOD and profitability.

In a comparative research study, Duppati et al. (2020) evaluated how gender diverse boards influenced the FP in two countries with distinct regulatory stances on the subject matter. Using India and Singapore as case studies, the study observed that embracing women in corporate leadership has a vital impact on FP of both countries regardless of whether being mandated by regulatory agencies (as in the case of India) or being persuaded (as in the case of Singapore).

Ouni, Ben Mansour and Arfaoui (2020) considered the influence that a gender diverse BOD has on FP of Canadian firms using an environment, social and governance orientation as a mediating factor. The research study analysed 133 Canadian companies over an 18-year period (2002 to 2019) and concluded that there is a positive link between women on the BOD and company financial profitability. Further, it was noted that environmental, social and governance orientation is pivotal in enhancing the investigated relationship.

In a study composed of 833 female board members across 5 094 family-owned Colombian companies, González, Guzmán and Pablo (2020) analysed the association between gender diverse boards and profitability utilising the random effect model. The research separated women on the board into two groups, family female directors and female directors who had no relation to the company. It was noted that the latter group (female directors who had no relation to the company) positively impacted company FP.

In an attempt to understand whether corporate board gender diversity enables better FP, Wang (2020) conducted an empirical inquiry on the discourse in Taiwan using companies listed on the Taiwan Stock Exchange Corporation and Taipei Exchange. Findings from this research indicate that the performance of Taiwanese companies is significantly impacted by a greater proportion of independent female directors within corporate leadership structures significantly impacts. Furthermore, it was noted that the expertise and managerial experience of female directors also contribute critically to FP.

Most recently, Jiang et al. (2021) found that a higher proportion of female executives is positively linked to the profitability of companies in China. This finding was confirmed through an analysis of 6 029 unbalanced firm-year observations for companies listed on both the Shenzhen Stock Exchange and the SSE.

Similarly, in examining the effect of gender diversity (proportion of female directors) on company profitability in the UK, Brahma, Nwafor and Boateng (2021) attained a positive relationship. Moreover, the results become explicit and favourably significant when there are three or more female directors compared to when there are only two or fewer female directors on the board.

2.5.2 Studies that found a negative relationship between women in the boardroom and FP

Although the studies in the previous section observed that increased gender diversity yields positive FP for companies, the following studies have evidenced otherwise. In fact, the studies described below report that an increase in women on the BOD can hamper an entity's FP. The negative relationship could be attributable to the fact that it becomes challenging to coordinate and effectively communicate with diverse boards. Additionally, where gender quotas are imposed, this could result in over-monitoring and a decline in FP.

An example of the negative impact is found in studies conducted on the impact of a Norwegian law which required that female directors make up at least 40% of company boards (Ahern and Dittmar, 2012; Böhren and Staubo, 2014). Ahern and Dittmar (2012) applied instrumental variable regression to 248 entities listed in Norway during the years 2001 to 2009. FP was measured using Tobin's Q and gender diversity was calculated as the percentage of women on the BOD. These

studies found that this constraint caused a deterioration in company value as a result of directors being younger and less experienced, an increase in company borrowings and inferior operating performance. This was in accord with the study by Adams and Ferreira (2009) which used an unbalanced panel of data and instrumental variable regression to analyse an eight-year period (1996 to 2003). The study utilised Tobin's Q as a market-based measure of performance as well as ROA, an accounting measure, and measured gender diversity using the number of female directors. It was established from the analysis that imposing gender quotas could result in over-monitoring and ultimately decrease shareholder value. Another factor which possibly contributes to the negative impact that women on the BOD have on FP is that diverse boards may be more challenging to manage than male only structures. These challenges consequently result in added costs which could stifle FP (Chapple and Humphrey, 2014; Dwyera, Richard and Chadwick, 2003).

More recently, Dankwano and Hassan (2018) found that having more women on a corporate board can negatively impact the profitability of entities listed on the Bombay Stock Exchange (BSE), India. This observation was made based on a research investigation of 220 Indian companies in 2017, composed of both privately-owned and publicly-owned companies, using FP metrics such as ROA and ROE.

Using random ordinary least squares regression analysis, Ajaz et al. (2020) examined the influence that women on the BOD has on the reputation of companies, CSR and company FP utilising a sample of 100 listed entities in Pakistan from 2010 to 2015. The results of the analysis concluded that gender diversity on the BOD negatively influences ROA and ROS. Likewise, a negative correlation was observed between female directors and other outcome variables such as CSR and corporate reputation.

Musa (2020) studied data from 15 financial institution listed in Nigeria. The study covered the period 2013 to 2015 and aimed to establish the link between corporate governance and profitability. While the research inquiry evaluated corporate governance from the perspectives of corporate gender diversity, board independence, and board meetings, the FP of the banks was measured using an operational performance ratio such as the ROA. Based on the analysis utilising

a random effects model, it was concluded that having female directors negatively impacts the FP of listed banks in Nigeria.

2.5.3 Studies that found no relationship between women in the boardroom and FP

Whilst the previously summarised studies have argued for and against the inclusion of women on the BOD, some studies have held a neutral position on the discourse. Amongst these are some recent studies, only one of which has been identified from a South African perspective. Kitsikopoulos, Schwaibold and Taylor (2018) sampled the leading 100 JSE companies and used simple regression analysis, multiple regression analysis and structural equation modelling to examine the correlation between women on the BOD and an entity's performance. A five-year study period was used, from 2010 to 2014, and in line with majority of the relevant studies, measured the independent variable as the percentage of female directors. FP was evaluated using Tobin's Q and ROA. It was determined that having a gender diverse board does not significantly influence the FP of South African entities. A possible explanation for this neutral position is that the average number of female directors on boards of the companies studied was below three for each of the five years analysed. This minimal inclusion of women on the BOD suggests that tokenism could have been a concern in the companies included in the sample. Additionally, with regards to other studies which found no relationship between gender diversity and FP, this could be because the effect of the gender diversity of the BOD may be different under different circumstances at different times. Over several companies and time periods, the results could offset to produce no effect.

Carter, D'Souza, Simkins and Simpson (2010) utilised a five-year panel data set consisting of 641 unique companies in arriving at the conclusion that there is no substantial correlation between having a gender diverse BOD (quantified as the number of female directors) and FP (proxies used were ROA and Tobin's Q). A 5-year time period was covered in this study (1998 to 2002) and a single OLS regression equation as well as a three stage least squares regression analysis was performed. This is consistent with an early study of Danish companies conducted by Rose (2007), which investigated a selection of entities from the Copenhagen Stock Exchange. The study claimed that there was no evidence of a substantial correlation between how an entity performs financially and having a gender diverse board.

Chapple and Humphrey (2014) selected data from the 300 largest listed Australian companies to analyse the economic effects of gender diverse boards. The analysis period covered the years 2004 to 2011. Portfolios of companies with and without female directors were created, as the authors deemed this methodology best determines whether board gender diversity offers higher returns. In addition to this method, a panel setting was utilised as a robustness test where ROA and Tobin's Q were utilised as proxies for FP. The percentage of female directors was used as a proxy for gender diversity. The one-factor model and four-factor model to analyse the period January 2004 to September 2011.

Meta-analysis was applied by Pletzer, Nikolova, Kedzior and Voelpel (2015) to investigate the link between having a gender diverse BOD and company profitability. The proportion of female directors was utilised to measure gender diversity and the authors indicated that ROA, ROE and Tobin's Q were the most effective means of assessing the financial results of a company. The conclusion from the analysis was that the relationship is consistently insignificant, meaning that females on the board do not enhance FP.

Using OLS regression, Mohammad, Abdullatif and Zakzouk (2018) conducted a research inquiry to understand the influence of gender diverse boards on profitability. The study focused on data relating to banks in Jordan over eight-years, 2009 to 2016. The research study, which considered corporate gender diversity at both board and top management level of corporate leadership, empirically noted that there was no statistical evidence that attests to a relationship between increased participation of females as corporate executives and improved FP of banks in Jordan.

Rawat and Sharma (2019) established no correlation between women on BOD of the mining and minerals sector corporations in India and FP of such corporations. This was based on a comparative study which assessed the effect of mandating that boards in the Indian mining and minerals industry must include female directors. The study which considered the performance of 14 listed Indian companies over a four-year period (2013 to 2017) concluded that it makes no significant difference when women are not represented or underrepresented on corporate boards of the assessed companies.

Likewise, Singh, Singhania and Sardana (2019) noted that there is no observable link between female directors on corporate boards of companies in India that were newly listed on the BSE and the FP of such companies. This neutral linkage was found in an empirical study using OLS regression which considered 41 companies over the period 2012 to 2016, who complied with the mandatory law of corporate gender diversity. Tobin's Q was analysed to measure FP. This study did not observe any positive outcome in entities who implemented the regulation.

Likewise, in a similar African study that was recently conducted in Tunisia, Jaber (2020) observed no plausible correlation between gender diverse boards and company profitability in listed entities selected from the Tunisian Stock Exchange. The empirical observation was noted in a panel data analysis which utilised a double least square regression analysis, whereby Tobin's Q was utilised to analyse the FP of entities in the sample. While the study which covered the period 2015 to 2019 established no significant relationship between female directors and FP, it was posited that a possible positive relationship might be found if the proportion of women is increased.

2.5.4 Summary of empirical studies reviewed

Table 1 below provides a summary of the empirical studies analysing the relationship between female directors and FP which were reviewed above.

Table 1: Summary of studies reviewed

Author(s), (Year)	Country	Sample, methodology and time period	Measurement of independent variables (female representation)	Measurement of dependent variables
Positive relationship between women in the boardroom and FP				
Matlala (2011)	South Africa	Boards with 25% or more of female directors from the BWA census report of top 70 companies. One-way analysis of variance, Kruskal Wallis test (ANOVA) 2010	Gender diverse boards (25% or more female directors) and Not gender diverse boards (less than 25% of female directors)	ROE, ROA, Tobin's Q
Lehobo (2011)	South Africa	Top 100 companies listed on JSE. Statistical data analysis (correlation and regression analysis) 2004 – 2008	Proportion of females on BOD	ROE, ROA, ROS
Liu et al. (2014)	China	Panel of over 2 000 listed firms in China. Fixed Effects Regression Analysis 1999 – 2011	Proportion of females on BOD	ROA, ROS
Kılıç and Kuzey (2016)	Turkey	149 companies listed on the Borsa Istanbul. Instrumental variables regression analysis 2008 – 2012	Proportion of females on BOD	ROE, ROA, ROS
Terjesen et al. (2016)	Multi-country study	3 876 public companies across 47 countries. GMM Regression 2009 fiscal year	Proportion of females on BOD	ROA, Tobin's Q

Author(s), (Year)	Country	Sample, methodology and time period	Measurement of independent variables (female representation)	Measurement of dependent variables
Gyapong et al. (2016)	South Africa	Hand-collected data from 245 listed firms. Fixed effects regression 2008 – 2013	Proportion of females on BOD	Tobin's Q
Giraldez-Puig and Berenguer (2018)	Spain	269 companies from Spanish High Council of Chamber. GMM panel data analysis 2000 – 2011	Number of executive women	ROA
Schrand et al. (2018)	USA	112 US Equity Real Estate Investment Trusts. Two-stage Heckman methodology 2005 – 2015	Proportion of females on BOD	Price per net asset value
Pucheta-Martinez et al. (2018)	Globally	Academic literature published during the period 1975 to 2017. Descriptive Methodology: Review of previous research	N/A	N/A
Sial et al. (2018)	China	4 257 firm-year observations, companies selected from the Chinese stock market. Pooled OLS regression 2008 – 2015	Blau Index	Tobin's Q
Scholtz and Kieviet (2018)	South Africa	Top 100 JSE companies OLS model 2013 – 2015	Proportion of females on BOD	Tobin's Q, ROA

Author(s), (Year)	Country	Sample, methodology and time period	Measurement of independent variables (female representation)	Measurement of dependent variables
Dankwano and Hassan (2018)	India	220 Indian companies listed on BSE. Methodology Independent sample t-test (Positive relationship between women in the boardroom and FP when measured using ROE) 2017	Companies with less than 10% female directors and Companies with more than 10% female directors	ROE, ROA
Ibrahim et al. (2019)	Kenya	Data from 55 insurance firms in Kenya. Mixed methods research methodology - Regression analysis and descriptive and inferential statistics 2017 financial reports.	Number of female directors	ROA, ROE
Ali et al. (2020)	China	3 400 companies listed on the SSE. Multivariate analysis and two-stage-least-square regression 2009 to 2018	Proportion of females on BOD	ROA, ROE
Duppati et al. (2020)	India and Singapore	Non-financial companies listed on the SGX.4 675 firm year observations for Singapore and 15 774 for India. Comparative research study, Multiple regression analysis Quantile regression analysis 2005 – 2015	Proportion of females on BOD	ROA, Tobin's Q
Ouni et al. (2020)	Canada	133 Canadian companies. Structural equation modelling 2002-2019	Proportion of females on BOD	Tobin's Q

Author(s), (Year)	Country	Sample, methodology and time period	Measurement of independent variables (female representation)	Measurement of dependent variables
González et al. (2020)	Colombia	523 Colombian family firms. Random effects model; two-way error component model 1996–2006	Proportion of females on BOD	ROA
Wang (2020)	Taiwan	Companies listed on the Taiwan Stock. Exchange Corporation and Taipei Exchange (1 065 firms for Tobin's Q, 1 063 firms for ROA) Multiple regression model, Ordinal regression model 2016	Proportion of females on BOD, Number of female directors	Tobin's Q, ROA
Jiang et al. (2021)	China	All non-financial listed companies on Shanghai and Shenzhen stock exchanges 2010 to 2019. 6 029 unbalanced firm-year observations Panel data regression (fixed effect) and Two-stage least square (TSLS) regression model	Blau index	Tobin's Q, ROE
Brahma et al. (2021)	UK	FTSE 100 firms in the UK. Fixed effect regression model and GMM 2005 to 2016	Number of female directors	Tobin's Q, ROA

Negative relationship between women in the boardroom and FP				
Adams and Ferreira (2009)	USA	Unbalanced panel of 86 714 observations from 1 939 firms. Instrumental Variables Regression 1996–2003	Number of female directors	Tobin's Q, ROA
Ahern and Dittmar (2012)	Norway	248 Norwegian listed firms. Instrumental Variables Regression 2001 – 2009	Proportion of females on BOD	Tobin's Q
Dankwano and Hassan (2018)	India	220 Indian companies listed on BSE. Methodology Independent sample t-test (Negative relationship between women in the boardroom and FP when measured using ROA) 2017	Companies with less than 10% female directors and Companies with more than 10% female directors	ROE, ROA
Ajaz et al. (2020)	Pakistan	100 index companies listed on the Pakistan Stock Exchange. OLS regression 2010- 2015	Proportion of females on BOD	ROA, ROE, ROS
Musa (2020)	Nigeria	15 banks listed in the Nigeria Stock Exchange. Random effect model 2013 to 2015	Number of female directors	ROA
No relationship between women in the boardroom and FP				
Carter et al. (2010)	USA	641 unique companies. Single OLS regression equation and a three stage least squares (3SLS) regression analysis 1998–2002	Number of female directors	Tobin's Q , ROA

Chapple and Humphrey (2014)	Australia	300 largest listed Australian companies. One factor model, four-factor model January 2004 to September 2011	Proportion of females on BOD	Tobin's Q
Pletzer et al. (2015)	Multi-country	Data from 20 studies on 3 097 companies published in academic journals. Meta-analysis, Sensitivity Analysis Systematic literature search was conducted in EBSCO on March 7, 2014	Proportion of females on BOD	ROA, ROE, Tobin's Q
Kitsikopoulos et al. (2018)	South Africa	Top 100 companies listed on JSE. Simple regression as well as multiple regression analysis, structural equation modelling 2010 to 2014	Proportion of females on BOD	Tobin's Q, ROA
Mohammad et al. (2018)	Jordan	16 listed Jordanian banks. OLS regression model 2009 to 2016	Proportion of females on BOD	ROA
Rawat and Sharma (2019)	India	14 NSE- listed companies of mining and minerals sector of India. Wilcoxon Signed Rank Test 2013 to 2017	Number of female directors	ROA, ROE, Return on capital employed
Singh et al. (2019)	India	41 Indian companies Listed on BSE. OLS regression model 2012 – 2016	Proportion of females on BOD, Blau Index and Shannon index	Tobin's Q
Jaber (2020)	Tunisia	46 Tunisian companies listed on the Tunisian Stock Exchange. Double least squares regression model 2015-2019	Proportion of females on BOD, Blau Index and Shannon index	Tobin's Q

Whilst there is theoretical support for diversity on BOD, specifically with regards to gender, the empirical studies reviewed in the table above present mixed evidence. The inconsistency in empirical research regarding gender diversity and FP could be attributed to different time frames, investigations in different countries, small sample sizes, short observation periods or insufficient control variables (Campbell and Miguez-Vera, 2008; Wang and Clift, 2009; Terjesen et al., 2016). As a result of the mixed evidence, there is no distinct direction regarding the correlation between gender diverse BOD and FP i.e., whether it is positive, negative or insignificant. This study has aimed to overcome some of these limitations such as observations over a short-term period which weaken the findings of previous research. Helm (2006) and Lehobo (2011), two South African studies, were conducted utilising periods relatively close to the end of the apartheid-era, which did not allow for a sufficient period in which to see the effects of the government's employment equity policies. As a result of this female representation would have still been low when these studies were conducted and could represent females being included in the boardroom merely as tokens. The commencement of this study accounted for this, as by 2007 more South African women were being included in leading business positions and not merely as tokens.

Whilst several studies focused on investigating whether allocating board seats to women positively influences a company's performance financially, only a few studies focused on investigating the optimal percentage of female directors which was included in this study.

2.6 Chapter summary

There is widespread data supporting the claim that there is a critical need for gender equality in the corporate boardroom. However, it remains a pervasive practice that men are being promoted to executive positions at a faster rate than women. Hence, tools need to be implemented to constructively challenge the status quo and consider practical measures to enable women to advance in their career goals, especially to be appointed as directors of companies. The current lack of gender diversity in boardrooms shows that there is still great opportunity for improvement, although it must be noted that South Africa fares well with regards to board diversity when compared to other countries.

Whilst the value that women bring to a company is immeasurable, an understanding of the association between gender diversity and specifically the FP of a company requires continued exploration. This relationship is the most significant one to organisations, regulators and other stakeholders when considering gender diversity at director level. Theoretically, this chapter found that agency theory and resource dependency theory suggest that the inclusion of female directors should enhance how an entity performs financially.

Though the international empirical evidence shows varying results regarding the influence of gender diversity on FP, all but one of the South African specific studies reviewed show that greater female participation at a board level does improve FP. It is, however, evident that the South African literature on the topic is limited compared to the international level. The observation period in the South African studies ranges from one year to a mere six years. This study investigated a longer period of time and included a period during which gender diversity increased in pervasiveness. Additionally, it was noted that none of the South African studies used a dynamic linear regression panel data model complemented by GMM. This literature review confirms that the most effective and widely used measures of FP are ROA, ROE and Tobin's Q. All the South African studies reviewed included at least one of these measures as dependent variables and the independent variable utilised to measure gender diversity was the percentage of women on the BOD.

It is evident from the summary of studies discussed in this chapter that globally there is a significant quantity of literature discussing the matter of gender diversity and FP. In recent years, this has become more prominent in South Africa. This conforms to the King IV which places emphasis on gender diversity targets. Additionally, of the studies included in this chapter which were available from 2016, the majority are suggestive that having gender diverse boards positively influences FP.

The next chapter details the methodology employed in the study.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

As described in Chapter 1, the aim of this study was to determine if greater female representation on a company's BOD results in improved FP for JSE-listed companies. The beginning of the study outlined the objective to establish if a relationship exists between women being represented on the BOD and company FP; as well as to determine what proportion of females, if any, is required on a board in order to enhance company FP. Previous pertinent research on gender diversity and company profitability was assessed in Chapter 2. Based on the value maximisation, agency and resource-dependency theories, it was supported that female directors enable boards to make sounder financial and non-financial decisions. Empirically, however, there is mixed evidence whether gender diversity on a board may improve its competence enough to enhance FP (Ahern and Dittmar, 2012; Dezsö and Ross, 2012; Abdullah, Ku Ismail and Nachum, 2016).

This chapter explains the procedure used to conduct the data analysis, variable analyses, as well as methods of model specification and estimation that were applied in this research. The model specification and estimation methods were performed using the GMM estimator. Likewise, the pre- and post-estimating techniques are further emphasised in this chapter. The model specification and estimation methods were critical in the testing of the defined hypotheses of this research which ultimately aimed to investigate how female directors impact the FP of JSE-listed companies.

3.2 Research hypotheses

3.2.1 Female representation in the company boardroom and FP

The core focus of this research was to examine whether including female directors in JSE-listed companies improves the FP. Given the mixed empirical evidence as noted in Chapter 2, this research study tested the following alternative hypothesis for statistical significance:

- H1: Female representation in the corporate boardroom has a significant impact on the FP of JSE companies.

3.2.2 Optimal proportion of female representation

Ahlden and Kollberg (2018) is an example of one of very few studies which investigated the optimal percentage of female directors. The authors stated that higher FP is attained when companies achieve at least 30% female representation on the board compared to boards consisting of only male directors. Contrary to this, Pucheta-Martínez et al. (2018) reported that a positive impact on FP is seen until the proportion of female directors reaches 11.72%, above which point profitability decreases. Hence this study used different thresholds of women on BOD to identify the optimal range of female directors. The level of representation stopped at 30% as there are very few boards in the JSE Top 40 companies with more than 30% female representation. The following alternative hypotheses were therefore tested:

- H2: There is a positive relationship between the proportion of women on boards and company performance when the percentage of women is less than 10%.
- H3: There is a positive relationship between the proportion of women on boards and company performance when the percentage of women is less than 20%.
- H4: There is a positive relationship between the proportion of women on boards and company performance when the percentage of women is less than 30%.

3.3 Population and sample of the study

This section discusses the population of the study as well as the data collected. The sample data was gathered to examine how a JSE-listed company performs financially when female directors are included on the board.

The sample of companies for this study was selected from the population of JSE-listed companies which includes companies from various sectors (basic materials, consumer goods and services, healthcare, oil and gas, financial services, industrial, technology, utilities and telecommunications). Singh and Masuku (2014) described an appropriate sample as one that accurately represents the population's characteristics. Sampling is intended to enhance representativeness, minimise errors and standardise the data (Nguyen et al., 2021). However,

studies revealed that only rarely is there a perfect association between the target population and the sampling frame (Quinlan, Babin, Carr, Griffin and Zikmund, 2019).

The JSE listed companies, particularly the Top 40, were considered as the financial data for these companies is easily available and reliable (van Zijl and Hewlett, 2022). The Top 40 index is a reasonable representation of the entire market, as it represents all sectors and more than 80% of the entire JSE market capitalisation (van Zijl and Hewlett, 2022). For this reason, the Top 40 companies are considered to be the more successful companies of those listed on the JSE (Mamaro and Tjano, 2019). Studies such as Marx and Mohammadali-Haji (2014), Moloji et al. (2021) and more recently van Zijl and Hewlett (2022) used the JSE Top 40 index as the centre of their analysis. Table 2 presents the number of companies per sector included in the JSE Top 40 which were sourced from the main-board using the Bloomberg database.

Table 2: Sector breakdown of sample

Sector	Sample (TOP40 JSE)
Basic materials	7
Consumer goods	7
Consumer services	5
Financial services	12
Healthcare	4
Industrials	3
Telecommunications	2
Technology	0
Oil and gas	0
Total	40

Source: Own construction based on data obtained from the Bloomberg database (2016)

With the growth in female directorships being gradual, there is a narrow spread of women across industries. According to the Businesswomen’s Association of South Africa Women in Leadership Census (2017), the consumer services and healthcare sectors have the highest percentage of women occupying director seats. Although the basic materials sector is mainly made up of mining

companies, an industry that is usually perceived to be traditionally male-oriented and less attractive to women, it is the sector with the third highest share of female representation. This is followed by consumer goods, telecommunications, financials and industrials. Technology and oil and gas have the lowest share of female representation on boards. As indicated in Table 2 above, the companies in the sample range across seven different sectors. These seven sectors are inclusive of the growth in gender diversity. This confirms that the JSE Top 40 companies were a suitable sample for this study.

According to Jackson, Bartosch, Avetisyan, Kinderman and Knudsen (2020), bigger companies usually promote more diversity on their corporate board due to the fact that they are more visible since they are legally required to disclose their corporate affairs to the public. These companies are perceived to have the ability to recruit and retain talented board members from a diverse pool of candidates. Therefore, the JSE Top 40 listed entities selected for this research adequately provides data, which culminates in reliable empirical findings regarding gender diversity of corporate boards in South Africa.

This research study considered all JSE Top 40 companies over a ten-year period from 2007 to 2016, 14 years post the apartheid period in South Africa. The ten-year period is further supported by literature such as Marinova, Plantenga and Remery (2016) who supported that the best source of analysis of a business is the financial statements which should cover a period of at least the last several years. They further explained that as a rule of thumb, the evaluation should cover a period of more than five years as part of the effort to better identify trends. Likewise, Chadha and Sharma (2015) also explained that performing financial investigations over a long enough period, such as ten years, reduces measurement error and ensures soundness of the analysis.

For this study, the period of the sourced data spanned from 2007 to 2016. Data relating to the selected companies was sourced from the Bloomberg database. In some cases, where the data was missing from the Bloomberg database, IRESS or the company website was accessed, and the required financial data was manually obtained from the financial statements. This observed period for the research investigation provides a reasonable timeframe, post the implementation of the Employment Equity Policy Act of 1998, which was enacted with the primary goal of ensuring that

South African corporations attain greater levels of corporate gender diversity. Previous South African studies such as that by Lehobo (2011), which conducted similar research for a five-year period ending 2008, suggested that it would be insightful and important for future research studies to consider the subject matter of corporate gender diversity in South Africa over extended time frames and scope. Hence, this study examined a longer period which includes the period during which gender diversity increased pervasively; with a higher proportion of women holding senior positions across South African corporations. Based on the consideration that more women hold director positions in corporate South Africa, assessing this impact on FP was deemed to provide recent, relevant and meaningful information for research in this area.

3.4 Variables analysis

The variables used for this research study were drawn from the collated sample panel data comprising dependent and independent variables. FP was the dependent variable used while the main independent variable was female representation on the board. A number of control variables were also incorporated, including board size, director independence, firm size and leverage. These variables are discussed below.

In some cases, where the data was missing from the database, the financial statements containing the required financial data were manually downloaded from the company's website.

3.4.1 Dependent variable: Firm performance

Firm performance is described as the benefit derived from the effectiveness of a firm's operations over time (Taouab and Issor, 2019). With regards to dependent variables, return on assets (ROA), return on equity (ROE) and Tobin's Q are the most extensively used metrics in previous studies to measure company performance. This study utilised these three measures of company performance as the dependent variables. This aligns with similar studies such as Scholtz and Kieviet (2018); Kılıç and Kuzey (2016); Liu et al. (2014) and Lehobo (2011). ROA and ROE are accounting-based measures of company performance (Scholtz and Kieviet, 2018) while Tobin's Q ratio is the market-based measure of company performance (Fu, Singhal and Parkash, 2016; Alajlani, 2019). With reference to the value maximisation theory, it is the long-term objective of an entity to maximise shareholders' wealth by utilising resources effectively (Kusi, Gyeke-Dako, Agbloyor

and Darku, 2018). This efficient allocation of resources and optimal decision making are evident via the specific financial metrics and ratios which include ROA, ROE and Tobin's Q, which have been developed to explicate the financial health and progression of the company (Ghardallou, Borgi and Alkhalifah, 2020). The performance measurement of a company reveals the steps taken by management to generate a reward for the shareholders. It evaluates how management directs corporate assets to enhance the owners' contribution and provide valuable information to stakeholders.

3.4.1.1 Return on assets (ROA)

In terms of profitability, ROA denotes how effectively a company utilised its assets in generating a profit (Heikal, Khaddafi and Ummah, 2014; Sinha and Sharma, 2016; Kanakriyah, 2021). The ROA ratio provides an idea of how efficiently management utilises its economic resources or assets to generate earnings (Jihadi, Vilantika, Hashemi, Afrin, Bachtiar and Sholichah, 2021). A higher ROA value indicates a more profitable entity. ROA, the accounting-based measure, elaborates on accounting standards established by professional bodies. It assesses the efficiency of the board by applying the profit rate as a measure performance (Kapopoulos and Lazaretou, 2007; Merendino and Melville, 2019; Kanakriyah, 2021). The ROA was calculated as follows:

$$ROA = \frac{\textit{Profit after tax}}{\textit{Total assets}} \quad (1)$$

3.4.1.2 Return on equity (ROE)

ROE is a profitability measure which indicates the proficiency of an entity to generate returns from the shareholders' investment in the company. ROE is an inward accounting-based measure which takes into consideration the operating performance of a company compared to the value of shareholders' equity. It is the ratio that indicates to investors how efficiently shareholders' money is being handled (Kanakriyah, 2021). It is simply the measure of profitability of a company relative to shareholders' equity (Maeenuddina, Hussain, Hafeez, Khan and Wahi, 2020; Al-Matari, Al-Swidi and Fadzil, 2014). The ROE was calculated as follows:

$$ROE = \frac{\textit{Profit after tax}}{\textit{Shareholders' Equity}} \quad (2)$$

3.4.1.3 Tobin's Q

Tobin's Q expresses the relationship between the market value of a physical asset and the book value of the same asset (Tobin, 1969). It is a prospective measure which depicts the value of a company including the expected future cash flows. The Tobin's Q ratio has been extensively utilised in financial research (Heikal et al., 2014). A company with a Tobin's Q of greater than one indicates that the market believes the company is valued higher than its book value and a value less than one shows that the value of the company is expected to decline (Suhendry, Toni and Simorangkir, 2021).

Whilst ROA and ROE are based on historical values, Tobin's Q is forward-looking. It represents shareholders' expectancies regarding future performance and potential growth opportunities for the company (Fu et al., 2016). The market-based FP measurement is observed from the perspective of investors and corporate financial analysts (Alajlani, 2019). Tobin's Q ratio was calculated as follows:

$$Tobin's\ Q_{i,t} = \frac{Market\ value\ of\ total\ assets}{Book\ value\ of\ total\ assets} \quad (3)$$

3.4.2 Independent variable: Women on the BOD

Women on the BOD, often expressed as board gender diversity, is the number of women on the board or the percentage of female directors (Chen, Leung, Song and Goergen, 2019; Post and Byron, 2015). Existing empirical studies on company performance and gender diversity used varying measures for women on the board. Some studies such as Arun, Almahrog and Aribi (2015); Liu et al. (2014) and Carter et al. (2010) used the number of women in executive positions. The most widely-used measure is based on the proportion of women to total members on the BOD. Following previous research such as that by Kılıç and Kuzey (2016), and, more recently, Green and Homroy (2018), Scholtz and Kieviet (2018) and Briano-Turrent (2022), this analysis measured women on the board as the proportion of women on the BOD calculated as the ratio of female directors to total directors, formulated as a percentage. The formula is as follows:

$$Women\ on\ the\ BOD = \frac{female\ directors}{total\ directors} \times 100 \quad (4)$$

With regards to hypothesis 2, female representation, the independent variable, was calculated in line with hypothesis 1, i.e., the proportion of women on the BOD calculated as the ratio of female directors to total directors, formulated as a percentage. A binary variable was used according to the different ranges; an example of this method was utilised in a recent study by Kılıç and Kuzey (2016). For the analysis of the first threshold, the dummy variable was used which holds the value of one where female representation is between 1% and 10%, or 0 otherwise. For the analysis of the second threshold, the dummy variable was used which holds the value of one where female representation is up to 20%, or 0 otherwise. Likewise, for the analysis of the third threshold, the dummy variable was used which holds the value of one where female representation is up to 30%, or 0 otherwise.

3.4.3 Control variables

This study integrated control variables based on the empirical and theoretical frameworks of previous studies relating to the association of women on the BOD and FP (Ahern and Dittmar, 2011; Schrand et al., 2018; Taylor, 2018; Ali et al., 2020). Control variables enhance the investigation of the said relationship. They guarantee the reasonableness of the findings and do not manipulate the outcome of the analysis. This is achieved by eliminating the factors that influence FP, thereby increasing the validity of the findings (Terjesen et al., 2016; Jaber, 2020). Board size, director independence, firm size and leverage were included as control variables in this study.

3.4.3.1 Board size

Theoretically, larger boards provide greater links to the external environment and more access to resources, implying enhanced FP. However, empirically, it has been argued that larger boards require a higher cost of monitoring because they are less cohesive groups when compared with smaller boards and monitoring is much more complex and results in higher communication costs. This may further result in the weakening of board effectiveness and ultimately company performance (Martín and Herrero, 2018, Scholtz and Kieviet, 2018). Based on prior literature such as Ahern and Dittmar (2012), Eckbo et al. (2018) and Matsa and Miller (2013), board size (calculated as the number of directors on the board) was incorporated as one of the control variables for purposes of this analysis.

3.4.3.2 Directors' independence

A number of scholars have studied the impact that director independence has on the effectiveness of the board, and some have successfully proved a link between director independence and FP (Alshaboul and Zraiq, 2020; Pucheta-Martínez et al., 2018).

As per King IV:

“Independence generally means the exercise of objective, unfettered judgement. When used as the measure by which to judge the appearance of independence, or to categorize a non-executive member of the governing body or its committees as independent, it means the absence of interest, position, association, or relationship which, when judged from the perspective of a reasonable and informed third party, is likely to influence unduly or cause bias in decision-making.” (King Committee on Corporate Governance, 2016:15)

Independent directors refer to non-executives who receive directors' remuneration but do not hold any significant financial affiliation to the entity and do not participate in any day-to-day activities (Alshaboul and Zraiq, 2020; Pucheta-Martínez, Bel-Oms and Olcina-Sempere, 2019).

Theoretically, a case for independent directors based on the agency theory and resource dependency theory exists. The agency theory suggests that because managers may act out of self-interest, they require greater monitoring through effective governance mechanisms (Fama and Jensen, 1983). One of the means of carrying out this monitoring effectively is believed to be by appointing independent non-executive directors. The resource dependency theory regards company directors as a resource (Hillman, Nicholson and Shropshire, 2008). Independent directors are a means of a company accessing external resources which are crucial for a company's success (Mishra, 2020). Consequently, directors' independence was included as a control variable in the context of this study and calculated as the percentage of independent directors on the board.

3.4.3.3 Firm size

Firm size is frequently included as a control variable when analysing FP (Jihadi et al., 2021) as the performance of a company can be influenced by firm size (Li and Chen, 2018). It is expected that larger companies benefit from the advantages of economies of scale and have a greater competitive edge (Lee-Kuen, Sok-Gee and Zainudin, 2017). Terjesen et al. (2009) argue against the notion that women have more success in smaller companies. Additionally, firm size appears to impact FP as bigger companies have a greater ability to influence FP (Singh et al., 2019). As established in prior literature (Yasser, Al Mamun and Ahmed, 2017; Ferrero-Ferrero, Fernández-Izquierdo and Muñoz-Torres, 2015), the control variables of this study included firm size measured as the natural log of total sales (Conyon and He, 2017; Pucheta-Martínez et al., 2019).

3.4.3.4 Leverage

Leverage is another commonly integrated control variable as a company's debt policy is thought to have an impact on company value (Aprilyani, Widyarti and Hamida, 2021; Markonah, Salim and Franciska, 2020; Pucheta-Martínez et al., 2019; Putri and Rachmawati, 2017). Debt levels of companies may affect the ability of directors to make decisions, since creditors may intervene based on their interests (Usman, Farooq, Zhang, Makki and Khan, 2019). The debt level may also be seen to have a positive relationship with market-related performance measures since debt is viewed as a means to alleviate the agency problem (Lee-Kuen et al, 2017). Company leverage, measured as total long-term debt divided by total assets, is used in this study to indicate what percentage of total assets of a company is financed by debt, as well as the effect of financing decisions on FP.

3.5 Variable definitions

Table 3 below lists the variables, their acronyms and definitions of the variables.

Table 3: Variable definitions and acronyms

Variable	Acronyms	Definitions
Dependent variables		
Return on assets	ROA	Profit after tax divided by total assets.
Return on equity	ROE	Profit after tax divided by shareholders' equity.
Tobin's Q	TOQ	Market value of total assets divided by book value of total assets.
Independent variables		
Women on the BOD	WB	Proportion of women on the BOD (female directors divided by total directors x 100).
Women on the BOD	WB1	Value of one when the proportion of women on the BOD is up to 10%, and zero otherwise
Women on the BOD	WB2	Value of one when the proportion of women on the BOD is up to 20%, and zero otherwise.
Women on the BOD	WB3	Value of one when the proportion of women on the BOD is up to 30%, and zero otherwise
Control variables		
Board size	BS	Number of directors on the board.
Directors' independence	DI	Percentage of independent directors on the board.
Firm size	FS	Natural log of total sales.
Leverage	LV	Total long-term debt divided by total assets.

3.6 Model specification and estimating technique

3.6.1 Sourcing the data and statistical package

The data variables were sourced from the IRESS and Bloomberg databases from 2007 to 2016. This study used Stata/IC 17.0 software to analyse the data which is characterised as panel data.

3.6.2 Utilising panel data

The panel contains time series data as well as cross-sectional data which includes both dependent and explanatory variables (Millo, 2018). Cross-sectional data consists of one or more variable values collected for several companies or sectors at the same point in time, while time-series data observes one or more variable values over some time (Sul, 2019). A dynamic linear regression model using panel data was adopted in this study to examine the influence of gender diversity on the profitability of companies.

Panel data methods are widely used in experimental studies in economics and corporate finance research, among others. This provides a reliable analysis method which adequately controls for unobservable heterogeneity and omitted variable biases (Low et al., 2015). Additionally, panel research with longer time periods provides valuable insights into the proposed relationships (Terjesen et al., 2016). Panel data adjusts to different estimating techniques such as the linear regression static model using OLS, fixed and random effect estimators and the linear regression dynamic model using GMM estimator and different diagnostic tests. This is because panel data provides rich information as well as variability to check collinearity amongst the variables and high degrees of freedom. Additionally, panel research with longer time periods provides valuable insights into the proposed relationships (Terjesen et al., 2016). The data offers rich information as well as variability that shows collinearity amongst the variables to a lesser extent and degrees of freedom to a greater extent.

From an econometric perspective, panel data is defined as a multidimensional data frequency that involves multiple phenomena observed over many time periods for the same set of firms (Sul, 2019). Panel data encompasses time series and cross-sectional dimensions. According to Croissant and Millo (2018), panel data possesses several advantages when compared to conventional time series and cross-sectional data and improves econometric estimates efficiency as follows:

- Panel data reduces co-linearity in independent variables by increasing data points and degrees of freedom.
- Longitudinal data enables analysis of more economic questions that cannot be handled with time series and cross-sectional data.
- Panel data also solves econometric problems arising from omitted variables correlated with explanatory variables (Anderson and Hsiao, 1982).

The multiple regression aspect of the dynamic linear regression model using panel data allows the researcher to determine the impact of more than one explanatory variable on a certain dependent variable and hence is a good approach for explaining causal theories (Keith, 2019). Specific firm factors and performance in finance literature are widely assessed through the reduced form investment model by Lang, Ofek and Stulz (1996). Numerous studies exploring the effects of company specific factors on the performance of firms, value and investment used the pooling regression, random effects and fixed effects estimators to estimate the standard reduced form model (Lang et al., 1996). However, these traditional estimation techniques cannot handle unobservable individual effects, collinearity and endogeneity problems. Hence the need to employ a robust technique that addresses such problems.

3.6.3 Causality and endogeneity: Problems and solutions

The main problem encountered when studying how female directors influence a company's financial results is endogeneity (Kılıç and Kuzey, 2016). The regression model for this study could possibly encounter omitted variables or reverse causality (i.e. a different association between two variables compared to what was expected). For example, well-performing companies may be prone to appoint female directors to appease stakeholders or validate their activities, while women may be drawn to well-performing companies (Chapple and Humphrey, 2014). The distorted direction of causality is a typical form of endogeneity found in research relating to attributes of the BOD and company profitability (Wintoki, Linck and Netter, 2012). While female directors influence FP, company value can also influence board gender diversity. This indicates that there are possibly observable and unobservable elements which might influence gender diversity on the BOD and the FP of a company concurrently. Another example to consider is the effect of the size of a firm on the size of the BOD, which may simultaneously impact the number of women selected as directors (Bennouri et al., 2020). Farag and Mallin (2016) argued that a company's historical

performance directly influences factors that affect the ownership structure such as the potential to generate revenue and the corporate information environment. These studies suggest that any estimation that does not observe the dynamic model nature will yield inconsistent estimates.

Pooled OLS, fixed effects, random effects and GMM estimating techniques are commonly used for the estimation of the panel data model. Hansen (1982) formalised GMM estimation, which is now a widely used method of estimation in economics and finance models. GMM is computationally easier than other estimation models. GMM is a statistical method that links observed economic data with the information in population moment conditions. This is done to obtain estimates of the unknown parameters of the economic model. The parameters are then utilised in order to conclude on the relevant question.

This study applied the dynamic linear regression model with GMM estimation to control for all endogeneity issues relating to women on the BOD and profitability such as unobserved heterogeneity and simultaneity. The linear regression static model can be presented as follows:

$$y_{it} = \beta_0 + \delta y_{i,t-1} + \beta_1 x'_{it} + w_i + v_t + \varepsilon_{it} \quad (\text{EQ1})$$

Where y_{it} represents the dependent variable of company i at time t , β_0 represents the constant term, $y_{i,t-1}$ represents the lagged value dependent variable of company i at time $t - 1$, β_1 represents the coefficient, x'_{it} represents the vector of explanatory variables of company i at time t , w_i represents unobserved company-specific effects, v_t represents time-variants and ε_{it} represents the error term of company i at time t .

The pooled OLS linear regression is consistent and provides efficient estimates of the common intercept β_0 and the slope vector of β_1 with the assumption of unobserved heterogeneity, which means that ε_{it} is independent of x'_{it} . Thus, when individual effects (firm-specific effects) are observed, the OLS estimator becomes biased and inconsistent. OLS ignores heterogeneity that may exist among the variables. According to Baltagi (2005), the fixed and random effects models are used to deal with unobserved heterogeneity. Therefore, the fixed effects model assumed that explanatory variable x'_{it} is independent of the error term ε_{it} that is composed of unobserved effects and is time-invariant, which means that w_i is an unobserved firm-specific effect and random

disturbance term v_{it} , and thus β_0 is independent of x'_{it} . The OLS method is an inappropriate estimation because of the heteroskedastic and serial autocorrelation of the error term ε_{it} .

Random effects estimation would produce consistent and efficient estimates assuming that the explanatory variable x'_{it} is uncorrelated with unobserved individual effects (firm-specific effects) w_i , which means that β_0 is uncorrelated with x'_{it} . Random effects assume that w_i individual effects vary over time, whereas the condition of the fixed effects estimates is consistent and unbiased when w_i is correlated to x'_{it} , which means that β_0 is correlated to x'_{it} (Baltagi, 2005; Ali and Anufriev, 2020).

In order to select between OLS and the random effects model, the Breusch-Pagan Lagrange Multiplier (LM) test was performed (Breusch and Pagan, 1980) while the Hausman test was performed to choose the appropriate model between fixed effects and random effects (Hausman, 1978).

Although it is widely acknowledged that the fixed and random effects models deal with the problem of unobserved heterogeneity, it is a more conservative approach. According to Wintoki et al. (2012), biases and inconsistent estimations relating to endogeneity still exist when the association between ownership structure and company value is examined using fixed and random effects estimators, because these estimators do not take into account concerns relating to endogeneity. These concerns exist within the variables which include measurement errors, and time-invariant and simultaneity effects. Thus, applying fixed and random effects estimating techniques would be biased and inconsistent. The linear regression dynamic model includes the lagged dependent variable in explanatory variables that leads to biased and inconsistent estimation, which means that the past dependent variable $y_{i,t-1}$ is correlated with w_i .

Based on the above premise, this study employed dynamic panel data to avoid the endogeneity problem that leads to biased and inconsistent estimations using GMM (Arellano and Bond, 1991).

To eliminate the endogeneity problem, the within transformation approach of fixed effects was used to remove the time-invariant effect w_i , but the transformed lagged of dependent variables

$(y_{i,t-1} - \underline{y}_{t,-1})$ was correlated with $(v_{i,t} - \underline{v}_i)$ transformed error term and $y_{i,t-1}$ was correlated with $v_{i,t-1}$ lagged random error term (Baltagi, 2008). Thus, the within transformation would produce inconsistent and biased estimation (Bond, 2002).

Since the level equation is not appropriate when one uses dynamic panel data, Lillo and Torrecillas (2018) suggested that first differences should be used to address the endogeneity problem. First difference eliminates the time-invariant effects w_i to apply the instrumental variable. The instrumental variables in the lagged dependent variable can be developed from the second ($y_{i,t-2}$ or $\Delta y_{i,t-2}$) and third ($y_{i,t-3}$ or $\Delta y_{i,t-3}$) lag of the dependent variable. These subtract the present level equation from the previous within the transformation. Thus, whilst instrumental variables correlate with lagged dependent variables, they are uncorrelated with random errors (Roodman, 2009).

Nickell (1981) proposed that biases and inconsistent estimating techniques cannot be solved by simply replacing one form of within transformation with another. Hence, the first difference according to Arellano and Bond (1991) does not account for potential orthogonality conditions. They added that the combination of first difference and GMM, called difference GMM, addresses the issue of the lagged explanatory variables in dynamic panel data to solve the endogeneity problem. In contrast, Blundell and Bond (1998) indicated that the difference GMM estimator is weak when there is the persistence of the lagged dependent variable and thus, produces biases for a finite sample. Therefore, Blundell and Bond (1998) and Arellano and Bond (1991) proposed an augmented version that produces system GMM which includes difference transformation and level equation. According to Arellano and Bond (1991) and Blundell and Bond (1998), system GMM combines the moment condition of both difference and level equations to provide a reliable estimating technique and eliminates all time-invariant measures from the estimating equation which makes the estimation more efficient. In the system GMM estimator, it is assumed that the first difference lagged is used for the level equation and the lagged level equation is used as instrumental for equations in first difference which are uncorrelated with unobserved individual effects, which means that variation of predetermined variables can be used as instrumental for within transformation. Thus, system GMM introduces more instruments and thereby increases the

efficiency of estimation (Asafo, Matuka and Dominic, 2019). The GMM estimator tolerates the use of instrument variables, which improves the condition of valid instruments and achieves over-identification of the estimator. The instrumental variable in GMM addresses the problem of an endogenous variable which includes the lagged dependent and other control variables.

In addition to proving the reliability of the GMM estimator, diagnostic tests are usually observed to determine whether the data is suitable for analysis. A variance inflation factor (VIF) test examines multicollinearity between data. The VIF determines the strength of correlation between the explanatory variables in a regression model. VIF values between 1 and 5 indicate a moderate correlation that does not necessitate corrective action, while values greater than 5 denote multicollinearity levels which are serious enough to lead to unpredictable estimates and overstated standard errors. In general, VIF values greater than 10 are considered as indicators of high multicollinearity (Mohammad et al., 2018; Sekaran and Bougie, 2016). Additionally, checking GMM estimator validity is important, using the Arellano and Bond test of autocorrelation errors and the Sargan and Hansen tests of over identification (Arellano and Bond, 1991). In line with the Arellano and Bond test, the autoregressive (AR) model is applied to the residuals in differences. The AR (1) assumed that serial independence in the original errors is necessary; the difference residuals are expected to be insignificant in autoregressive AR (2). Hence, the Hansen or Sargan tests are employed to assess the validity instrument of over-identifying restrictions for strict exogenous instruments in the GMM estimator. According to Pathan and Skully (2010), when testing for overidentification of instruments in GMM estimation, the Hansen test results are more reliable. Therefore, to achieve more accuracy in this study model, the results of GMM estimating methods with the diagnostic post-estimation test were used to confirm the reliability of the results.

Table 4: GMM post estimation techniques

Tests	Null hypothesis	Standard assumption (p-values)
AR (1)	First-order autocorrelation	Significant ($p < .05$)
AR (2)	No second order autocorrelation	Insignificant ($p > .05$)
Hansen test	Instruments as a group are exogenous	Insignificant ($p > .05$)

3.7 Empirical model specification

An empirical model was employed to validate the hypotheses relating to the study's objectives. Based on the panel data specification, a linear regression with the dynamic model was employed using the GMM estimating techniques for research objectives 1 and 2 as follows:

Objective 1:

Determine whether there is a relationship between the proportion of women on the BOD and company FP.

$$FP_{it} = \alpha + \delta FP_{i,t-1} + \beta WBrep_{i,t} + \varphi Z_{i,t} + \eta_i + \varepsilon_{i,t} \quad \text{Model 1}$$

Where FP_{it} is company performance (measured as either ROA, ROE or Tobin's Q) of company i at time t , $FP_{i,t-1}$ is the lagged value of company performance, $WBrep_{it}$ is the percentage of women on the BOD of company i at time t , and Z_{it} is the matrix of control variables (namely board size, director independence, firm size and leverage), η_i represents unobserved company-specific effects, and ε_{it} represents the error term the of company i at time t .

Objective 2:

Determine what proportion of women, if any, is required on a BOD to enhance the FP of companies.

$$FP_{it} = \alpha + \delta FP_{i,t-1} + \beta WB2rep_{i,t} + \varphi Z_{i,t} + \eta_i + \varepsilon_{i,t} \quad \text{Model 2}$$

$$FP_{it} = \alpha + \delta FP_{i,t-1} + \beta WB3rep_{i,t} + \varphi Z_{i,t} + \eta_i + \varepsilon_{i,t} \quad \text{Model 3}$$

$$FP_{it} = \alpha + \delta FP_{i,t-1} + \beta WB4rep_{i,t} + \varphi Z_{i,t} + \eta_i + \varepsilon_{i,t} \quad \text{Model 4}$$

Where FP_{it} is company performance of company i at time t , $FP_{i,t-1}$ is the lagged value of company performance, $WB1rep_{it}$ is a binary variable indicating a proportion up to 10% of women on the BOD of company i at time t , $WB2rep_{it}$ is a binary variable indicating a proportion up to 20% of women on the BOD of company i at time t , $WB3rep_{it}$ indicates a proportion up to 30% of women on the BOD of company i at time t , and Z_{it} is the matrix of control variables of board size, director independence, firm size and leverage, η_i represents unobserved company-specific effects, and ε_{it} represents the error term of company i at time t .

$$FP_{it} = \beta_0 + \gamma FP_{i,t-1} + \phi_1 WBrep_{it} + \phi_2 WBrep_{it}^2 + \varphi Z_{it} + \eta_i + \varepsilon_{it} \quad \text{Model 5}$$

Whilst models 1 to 4, highlights the possibility of a linear relationship between women on the BOD and FP, Model 5 addresses the nonlinearity of this relationship in quadratic term. The quadratic term of the women on the BOD ($WBrep_{it}^2$) is added in order to endogenously determine the threshold level after which women on the board exert an effect on FP. To check for the existence of a quadratic relationship, we include the square of the independent variable (women on the BOD). When the coefficient of the quadratic term is significant, the relationship is nonlinear (Birindelli, Iannuzzi and Savioli, 2019; Nguyen, Locke and Reddy, 2015). In order to determine the minimum and maximum turning points, the results of the quadratic squared function above is used (Birindelli et al., 2019). The calculation is carried out using the coefficient of quadratic function in the model. The breakpoint of quadratic function values, in line with previous research (Nguyen et al., 2015; Birindelli et al., 2019), is calculated as follows.

$$\frac{d^2y}{dx^2} = \beta x + \beta x^2 + c \quad \text{Model 6}$$

The turning points are found by differentiating y (Tobin's Q, ROA, and ROE) with respect to x (woman on the board), by letting $\frac{dy}{dx} = 0$ solve for x. Thus, to determine what proportion of women on board is the turning point, the value $\frac{d^2y}{dx^2}$ is calculated. If $\frac{d^2y}{dx^2} > 0$ is the minimum turning point. If $\frac{d^2y}{dx^2} < 0$ is the maximum turning point.

$$x = \frac{-2b \pm \sqrt{2b^2 - 4ac}}{2a} \quad \text{Model 7}$$

3.8 Chapter summary

Chapter 3 detailed the research methodology utilised in this study to address the research question of whether greater inclusion of women on the BOD of JSE-listed companies has a favourable outcome on FP. The study adopted the empirical positivism method in developing the model hypotheses. A pre-existing theoretical base was identified and relied on. The sample and time period covered were highlighted in this chapter. The key variables, model specification and estimation techniques were explained.

Chapter four presents the findings of the data analysis using tables and graphs. It evaluates the extent to which they support or refute the findings of previous research.

CHAPTER 4: PRESENTATION OF FINDINGS

4.1 Introduction

As stated previously, the research objective of this study was to establish if the FP of JSE-listed companies improves when more women are included on the BOD. The previous chapter examined the research methodology, which included a description of the research design, the selected sample, scope, and the data obtained to perform the investigation. Chapter 4 presents the results of the empirical model specification, estimation methods and diagnostic tests discussed in the previous chapter. This chapter presents the relationship between female directors on JSE-listed companies and the resulting FP of those companies. This was conducted using data from 2007 to 2016 of the Top 40 companies listed on the JSE. The descriptive statistics of the variables and the correlation coefficients which determine the relationship amongst the variables are summarised. More importantly, a linear dynamic regression model with GMM estimating techniques was used, and all necessary diagnostic tests were performed to ensure the model is appropriate for quality assurance of the study's findings.

4.2 Descriptive statistics

Table 5 below depicts the descriptive statistics showing the average values of the variables across the observation period which was 2007 to 2016. This includes firm performance (ROA, ROE and Tobin's Q), women on the board and control variables (board size, director independence, firm size and leverage). The descriptions of all the variables were provided in Table 3 (in Chapter 3).

Table 5: Descriptive statistics – Summary of firm performance, women on the board and control variables

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
<i>Firm performance</i>					
ROA (%)	341	9.5076	7.8132	-20.1500	53.1000
ROE (%)	341	28.0200	22.2730	-62.7400	143.0100
TOQ (times)	341	1.3735	1.2936	0.0545	8.4754
<i>Women on the board</i>					
WB (%)	341	18.3650	8.0822	0.0000	40.0000
<i>Control variables</i>					
BS (number of directors)	341	13.3490	3.3701	8.0000	24.0000
DI (%)	341	61.4010	14.5930	26.1000	92.8600
FS (R millions)	341	11.2260	1.0300	10.9660	11.4920
LV (%)	341	21.5530	19.1300	0.0000	263.5200

Source: Own calculations using balanced panel data over the period of 2007 to 2016. Data obtained from Bloomberg online database

4.2.1 Firm performance

ROA, the accounting-based measure of how a company performs financially, shows an average value of 9.51% with a minimum and maximum value of -20.15% and 53.10% respectively; while the ROE average value is 28.01% with a minimum and maximum value of -62.74% and 143.01% respectively. The ROA and ROE both imply that listed firms on the JSE market net income average 9.51% to firm assets and 28.01% to shareholders. The higher ROE suggests that the companies in the JSE Top 40 index provide favourable returns to investors and efficiently manage financing to grow their business. The minimum profitability figures of some of the companies included in the sample reached negative values indicating that during certain periods some companies had more expenses than income. The period of the study included the years 2007 to 2009, during which time the global economic crisis critically affected the South African economy. Although the country did begin to experience positive growth rates from 2010, these were still well below earlier achievements and not enough to fully recover from the financial crises. Additionally, in 2016, unemployment in South Africa reached 27%, the highest rate experienced in that decade. The economic challenges faced by the country are attributable to the inability of the country to adjust after the global meltdown.

Amongst the accounting-based performance measures, the highest variability was identified in ROE, with an average variation of 22.27%. This is apparent because the mix of debt and equity used to finance a company's operations influences its degree of financial risk. Differing capital structures expose companies to different degrees of changes in profits. Companies that were highly leveraged during the period of economic instability experienced a greater decline in ROE as the reduction in sales resulted in a reduction of profits, and the high existing company debt placed significant strain on the cash resources.

On average, the value of Tobin's Q as a measure of firm performance is 1.37 times with a minimum and maximum value of 0.06 times and 52.11 times respectively. This implies that the average actual market value of firm securities on the JSE is 1.37 times the replacement cost of its assets (Brahma et al., 2021). When Tobin's Q is greater than one, it is an indication that the value of the company exceeds the cost of its assets. These companies are believed to possess intellectual capital and a competitive advantage as it is indicative of the market's positive expectancies of future profits.

4.2.2 Women on the board

The average percentage of women on the BOD is 18.37% confirming that women are still significantly underrepresented in the boardroom. The boardroom of the average listed company on the JSE is led by a majority of males who account for almost 82% of director seats. In support of the findings by Mans-Kemp and Viviers (2019), it is evident that the majority of JSE-listed companies are not yet complying with the recommendations of the country's King III Report on Corporate Governance for South Africa 2009¹ (King III) which indicates to the BOD the need to consider whether it adequately accounts for gender diversity (King Committee on Corporate Governance, 2009). The statistics clearly highlight that the governance recommendation of 50% women on boards in South Africa is not adhered to. The proportion of women on the BOD varies greatly across the study period, with a minimum of 0% and maximum of 40%. It is apparent from the statistics that even some of the leading South African companies are falling short on the inclusion of women in the boardroom. However, it must be noted that a concerted effort has been

¹ It is noted that, although King IV is effective for financial years commencing on or after 1 April 2017, reference here is made to King III as this was the relevant governance code under which the companies in the sample were operating.

made to improve boardroom gender diversity, albeit gradually. Figure 1 below depicts the growth in female directorship for the sample of companies analysed over the ten-year period.

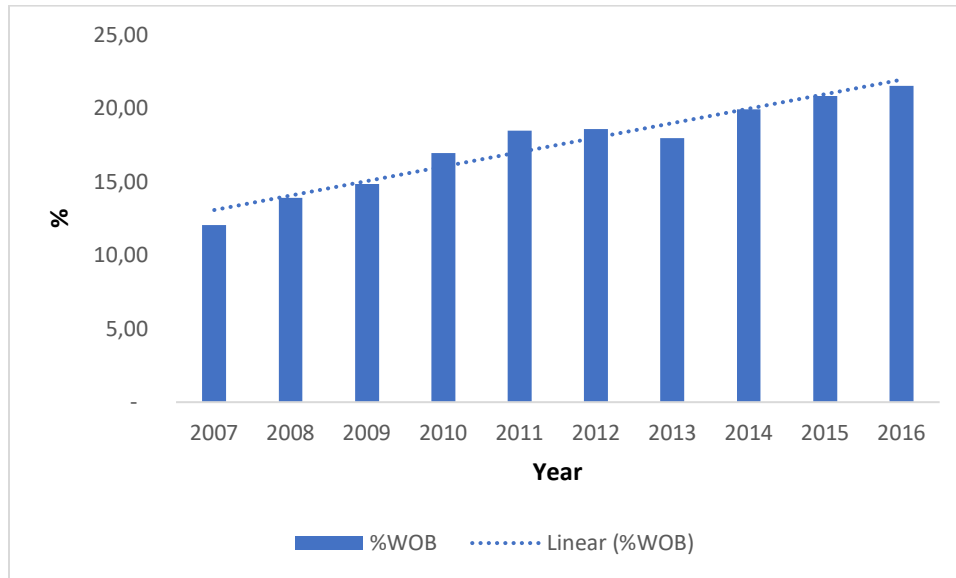


Figure 1: Mean of women on the board

Source: Own construction based on data obtained from Bloomberg online database.

Figure 1 depicts the improvement made by South African corporate boards. The average sampled company’s board had an increase of approximately 9% in female representation over the ten-year period. A slight decrease in the average of female directors was noted in 2013, which corresponded with an overall decrease in the average size of boards for that year.

4.2.3 Control variables

The average board size of directors that oversee the operation of firms listed on the JSE is 13 directors, with a minimum and maximum of eight and 24 directors respectively. The standard deviation is 3, indicating that all the sampled companies maintain a similar board size. In South Africa, the Companies Act 71 of 2008 compels listed companies to comprise of at least three directors with no maximum number stipulated. King III proposes that the company’s distinctive requirements for the board to carry out its duties must be considered when deciding on the number of directors to be appointed. Additionally, King III recommends that “boards must consider whether its size, diversity and demographics make it effective. Diversity applies to academic qualifications, technical expertise, relevant industry knowledge, experience, nationality, age, race

and gender.” (King Committee on Corporate Governance, 2009:39). It must be noted that in addition to these factors, King IV emphasises the importance of diversity targets when considering the number of directors required by a company (King Committee on Corporate Governance, 2016).

Similar to the board size statistics of this study, Muchemwa, Padia and Callaghan (2016), using data from the JSE over a seven-year period, 2006-2012, found the average board size to be 13.54 (directors) with a maximum of 24 and an average standard deviation of 4. The Australian Institute of Company Directors indicated that the typical large, listed company is made up of eight to 12 directors. The most common board size of US publicly-listed firms is between eight and 11 directors (Muchemwa et al., 2016). This indicates that the top performing South African companies are aligned with the composition of international boards in terms of the number of directors. Further, a majority of the literature based on board size is in favour of smaller boards, arguing that not only are smaller boards more unified and efficient, but are also better at monitoring the company.

Table 3 depicts a company’s director independence as the proportion of independent directors to total directors. The average proportion of independent directors on JSE-listed company boards is 61.40% with a minimum and maximum value of 26.1% and 92.86% respectively. Although the average for the sample selected indicates that more than half of the boards consist of independent directors, the minimum value (26.1%) and the standard deviation (14.5%) imply that there are still companies which rank high on the JSE but do not align with the corporate governance recommendations. King III recommends that the majority of directors should be independent and non-executive. The reason for this is that independent directors are perceived to be better at monitoring and transparency. Whilst complying with corporate governance recommendations does not necessarily result in improved FP, it should be embraced for sustainable development and social and ethical reasons (King Committee on Corporate Governance, 2009).

The average firm size on the JSE, which is in logarithm transformation, is 11.23. There has been a steady growth in terms of company size over the years included in the study with the minimum value of 10.97 being in the first year of the study (2007) and the maximum value of 11.49 being in the last year of the study (2016).

With regards to leverage statistics, the minimum and maximum values are on extreme ends at 0% and 263% respectively. This together with the standard deviation of 19% indicates that companies have different capital structures based on their industry, business risks, profitability and capital requirements. The average firm leverage on the JSE market is approximately 21%. This implies that 21% of the firm assets on the JSE are financed by debt and 79% are financed by shareholders' contributions. Mohohlo and Hall (2018) claimed that South African companies are more conservative in nature and may opt to have lower debt. It may also be possible that these top performing companies are profitable and able to facilitate the accumulation of capital through their retained earnings rather than seeking debt financing.

4.3. Correlation coefficient

The correlation coefficient analysis was used to establish the degree of the relationship between women on the BOD and FP. Table 6 below indicates the degree of the relationship between the variables used in the regression analysis. The variance inflation factor (VIF) is further measured to detect multicollinearity among the variables. The VIF identifies the correlation and determines the strength of correlation between the independent variables.

Table 6: Correlation coefficients analysis

	ROA	ROE	TOQ	WB	BS	DI	FS	LV	VIF
WB	0.0610*	0.1551***	-0.0006	1.0000					1.06
BS	-0.2996***	0.0319	-0.3822***	-0.0030	1.0000				1.66
DI	-0.1053**	-0.2329***	0.0516	0.0920*	-0.2604***	1.0000			1.23
FS	-0.6103***	-0.2261***	-0.5859***	0.0925*	0.4901***	0.1113**	1.0000		1.98
LV	-0.0388	-0.1236**	-0.0303	-0.0399	-0.2856***	0.1100**	-0.0893*	1.0000	1.13

Z-statistics are in parentheses, * st the 10% level, ** significant at the 5% level, *** significant at the 1% level

Source: Own calculations using panel data over the period of 2007 to 2016. Data obtained from Bloomberg online database.

From Table 6 above a statistically significant relationship is evident between women on the BOD and financial results when analysing the accounting-based measures. Additionally, the direction of the coefficients shows a positive association with coefficients of 0.06 for ROA and 0.16 for ROE. However, the correlation analysis indicates a negative and insignificant relationship between Tobin's Q and female directors. Bhagat and Bolton (2008) claimed that market-based measures are subject to investor expectation. They contended that investors anticipate that FP will be affected by attributes of the BOD such as gender diversity. There will be no association between long-term market returns and gender diversity, regardless of whether a true association does exist (Wiley and Monllor-Tormos, 2018). With reference to the agency theory, Amin, Reham, Ali and Ntim (2021) noted that greater female representation on boards significantly reduces agency costs and further mitigates conflicts in the principal-agent relationship.

Board size shows a negative and statistically significant correlation with ROA as well Tobin's Q, with a coefficient of -0.29 and -0.38 respectively. Although board size and ROE are positively correlated, with a coefficient of 0.0319, the relationship is not statistically significant. This indicates that firm performance may deteriorate as board size increases.

Independent directors who are not on the executive team nor included in a company's day-to-day business, have a statistically significant link with both ROA and ROE. With coefficients of -0.11 and -0.23 respectively, the direction of the relationship between director independence and ROA and ROE is a negative one. This suggests that an increase in director independence on the board may negatively impact FP.

It is noted from Table 6 above that a positive and significant correlation exists amid director independence and female directors. The coefficient is 0.09 and significant at the 10% level. Additionally, a statistically significant relationship is noted between director independence and board size. The direction of this relationship is a negative one (-0.26) and with a VIF value of 1.23 there is no multicollinearity.

Firm size presented a negative and statistically significant correlation with ROA (-0.61), ROE (-0.23), and Tobin's Q (-0.60) suggesting that larger firms do not improve FP. With reference to

the agency theory, it is believed that firm size impacts the performance of a company as it changes the ownership structure and control of the organisation (Jensen and Meckling, 1976). There appears to be a statistically significant relationship between firm size and board size at the 1% level. This implies that bigger companies are linked to bigger board sizes. However, based on the coefficient level of 0.49 and VIF value of 1.98, there is no multicollinearity.

The firm leverage, measured as total debt divided by the total assets, is negative and significantly correlated with ROE, with a coefficient -0.1236. Whilst not statistically significant, firm leverage is negatively correlated with ROA and Tobin's Q, with a coefficient of -0.03 for both measures. Firm leverage is not significantly correlated with women on the board. However, there is a statistically significant and negative relationship between firm leverage and board size and firm size. The level of leverage is higher in bigger firms. Additionally, firm leverage has a positive and statistically significant relationship with director independence which indicates that independent directors may bring more access to external resources for the firm.

None of the correlation coefficients of the variables in Table 6 above is larger than 0.49, which infers multicollinearity will not emerge as a serious problem unless the coefficient exceeds the regressor (Daoud, 2017). It is only when the degree of correlation between the independent variables is too high that the effects of it will be adverse and unacceptable. In general, VIF values greater than 10 are considered as indicators of high multicollinearity (Mohammad et al., 2018; Sekaran and Bougie, 2016). VIF values between 1 and 5 imply moderate correlation and no corrective measures are required. All VIF values in the table above are well below 5, with the highest value being 1.98, which suggests that multi-collinearity is not a problem with the panel data model used.

4.4. Objective findings and hypotheses discussion

4.4.1. Objective 1: Determine whether there is a relationship between the proportion of women on the BOD and company FP

Hypothesis 1: Female representation in the corporate boardroom has a significant impact on the FP of JSE companies.

Table 7 presents the results of the first objective using regression model 1. The correlation between the female representation on the BOD and FP was tested while controlling other factors such as board size, director independence, firm size, and leverage.

Table 7: Objective 1: regression model 1 - findings on the relationship between the proportion of women on the BOD and FP of JSE-listed firm in South Africa

	ROA	ROE	Tobin's Q
WB	0.1666 **	0.1894 *	0.0162 *
	(2.1500)	(0.4300)	(1.7100)
BS	0.0675	(0.0210)***	0.0419 *
	(0.3500)	(1.1700)	(2.2300)
DI	(0.0275)	0.0567	0.0049
	(0.9700)	(0.1300)	(1.6300)
FS	(1.8114)***	(0.0000)	(0.2218)***
	(0.7000)	(0.6700)	(4.5800)
LV	(0.0466)	0.0632	(0.0022)*
	(0.7100)	(0.0700)	(0.4400)
FP(t-1)	0.4263 ***	0.3999 ***	(0.7166)***
	(3.1500)	(3.2600)	(10.4000)
Cons	24.0670 **	(0.0221)	1.7846 **
	(2.5400)	(0.0300)	(2.6400)
Observations	302	302	302
AR (2)	0.1000	0.7800	0.3670
Hansen test	0.4650	0.4290	0.9790

Z-statistics are in parentheses, * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

Source: Own calculations using two-step system GMM with panel data over the period of 2007 to 2016.

With statistically significant coefficients of 0.1666 and 0.1894 for ROA and ROE respectively, the findings show that women on the BOD is positively related to FP. Additionally, the finding exhibits that the proportion of female directors is positive and statistically significantly related to firm performance when using the Tobin's Q market-based measure with a coefficient of 0.0162. These findings imply that female directors positively influence the capital market value of JSE-listed companies. A gender-diversified board results in higher FP which is consistent with the agency and resource-dependency theories discussed earlier in this dissertation which indicated that a diversified board results in enhanced innovation, better decision-making and improved allocation of company resources. The results support the notion that women on the BOD brings about an improvement in company profitability which is consistent with other recent literature such as Giraldez-Puig and Berenguer (2018); Schrand et al. (2018); Scholtz and Kieviet (2018); Duppati et al. (2020) and Brahma et al. (2021). The results of this study denote that greater gender diversity yields better decision-making and enhances FP. This study therefore concludes that there is a positive and significant relationship between board gender diversity and company FP, thus supporting hypothesis 1.

The robust GMM model estimator using ROE, ROA and Tobin's Q as measures of performance demonstrates that female directors are positively and significantly associated with the FP of JSE-listed companies.

The following tests were presented:

- The Arellano and Bond test of autocorrelation errors for autoregressive for ROA, ROE and Tobin's Q results.

The results of AR (2) revealed that the *p*-values of the AR (2) test are above .05 which implies that the null hypothesis of no serial correlation could not be rejected (Asafo et al., 2019; Kieviet, 2020). Thus, the results of system GMM using the measures of FP in model 1 are valid.

➤ The Hansen test for overidentification restrictions

The Hansen test for overidentification restrictions and the Arellano and Bond test of autocorrelation errors for autoregressive for both ROA and Tobin's Q were presented. All the Hansen test p -values are above .05, which implies that the null hypothesis could not be rejected, and thus, the overidentification restriction is valid.

The most statistically significant relationship with board size is found with the accounting-based measure, ROE. The statistically significant relationship is a negative one with a coefficient of -0.0210. This is supported by the agency theory which suggests that larger boards have greater agency costs. It becomes increasingly difficult to coordinate and effectively communicate with larger boards (Yan, Hui and Xin, 2021). With reference to the resource dependency theory and the agency theory, the BOD serves two critical functions within every organisation, one of which is ensuring resources are well allocated and utilised in running the organisation (Herrera-Echeverri, Gaitan, Antonio Orozco and Soto-Echeverry, 2018). The other critical purpose of the company board is to manage and monitor the organisation on behalf of the shareholders (Tulung and Ramdani, 2018). Thus, both theories assert that the BOD and its composition thereof plays a critical influence in the performance of the organisation via the monitoring and deployment of resources, further using this influence to moderate and mediate the stakeholder relationships of the organisation (Endrikat, De Villiers, Guenther and Guenther, 2021.). This confirms that boards with larger numbers of directors have greater potential for conflicts in making decisions regarding the allocation of resources and the management or style of monitoring.

This is consistent with an empirical study by Nguyen et al. (2015) who established that board size is negatively associated with company performance. Yan et al. (2021) agreed with this negative correlation and explained that a larger board will incur more agency costs as the number of directors increases, which in turn increases the costs of coordination and communication. It may be more difficult to reach agreements in meetings with more directors and for directors to express their views due to factors such as time constraints. The findings of this study agree that a larger board is less proficient at exerting control over management and ultimately results in lower financial profit.

Although it may be expected that greater board independence means stricter monitoring over executive management, constraining aggressive earnings management and an increase in performance, this is not necessarily the case as seen from the negative correlation (-0.0275) between director independence and ROA. Although there is a positive correlation between director independence and ROE (0.0567) and Tobin's Q (0.0049), it is noted that these correlations are not statistically significant. Merely having independent directors on a board cannot enhance the financial results of a company. There are several possible reasons for this negative relationship such as the directors may not actually understand the business, the company strategy or industry dynamics and they may not have the required expertise to fulfil their advisory roles effectively. Additionally, because independent directors have other commitments, they may not be able to invest enough of their time in the company or they may even have been appointed merely to meet corporate governance requirements (Martín and Herrero, 2018). For these reasons, and in support of other recent studies such as Mishra (2020) and Chijoke-Mgbame, Boateng and Mgbame (2020), a higher number of independent directors may have no impact on FP or may even have a negative one. Gutiérrez, and Sáez (2013) agreed that presence of independent directors is not an effective means of alleviating the agency problem which results from conflicting interests amid the owner and minority investors.

Firm size presented a negative and statistically significant correlation with ROA and Tobin's Q. Singla (2011) summarised the reasons for this negative relationship between firm size and FP as diseconomies of scale, larger companies incurring costs that are higher than necessary and increased difficulties in managerial tasks which lead to inefficiencies and lower profits. In line with the agency theory, it is asserted that the larger a company grows in size, the more likely it tends to experience conflicts of interests, operational and communicational inefficiencies and complexities in how it executes and implements its strategies (Herlambang, Murhadi and Andriani, 2020).

Table 7 reveals a negative relationship between leverage and ROA as well as a negative and statistically significant relationship with Tobin's Q. This indicates that increasing debt in the capital structure of a company reduces profitability. An underinvestment conflict exists between shareholders and debt holders, in which a leveraged company declines beneficial investment

prospects as there would be inadequate returns to the shareholders because debt holders would receive a portion of the benefits from the investment. This stifles the shareholders' incentive to invest in profitable investments (Vengesai and Kwenda, 2018). With reference to the agency theory, Kalash (2019) asserted that although debt may reduce the agency problem between the shareholders and managers, it results in greater conflicts of interest between shareholders and debt-lenders. This heightened agency problem between shareholders and debt-lenders has a negative impact on a company's profitability. Companies with risky debt find it too expensive to attain additional finance for further investments as a result of these agency costs. Ann and Manurung (2019) agreed that companies in this position are averse to investing because any benefits from the investments will accrue to debt-lenders rather than the shareholders. In this regard, firms with more debt have less capacity to exploit other valuable investment opportunities and this therefore lowers firm performance (Aivazian, Ge and Qiu, 2005). Additionally, the negative correlation between leverage and Tobin's Q suggests that an escalation in leverage restricts the value of the company. The negative relationship identified is backed by the research analysis performed by Mule, Mukras and Nzioka (2015).

4.4.2. Objective 2: Determine what proportion of women, if any, is required on a BOD to enhance the FP of companies

Hypothesis two: There is a positive relationship between the proportion of women on boards and company performance when the percentage of women is less than 10%.

Hypothesis three: There is a positive relationship between the proportion of women on boards and company performance when the percentage of women is less than 20%.

Hypothesis four: There is a positive relationship between the proportion of women on boards and company performance when the percentage of women is less than 30%.

Tables 8, 9 and 10 present the results of the second objective which aimed to investigate the critical mass of female representation. The study used different thresholds of women on BOD to examine the impact that different proportions of female directors have on FP. Specifically, the thresholds

used were up to 10%, depicted in Table 8; up to 20%, depicted in Table 9; and up to 30%, depicted in Table 10.

Table 8: Findings to second objective: regression model 2 – The proportion of women on the BOD and FP when the percentage of the women is up to 10%

	ROA	ROE	Tobin's Q
WB1	3.6947 *	18.9410 *	(1.5243)
	(1.7100)	(1.6700)	(1.7100)
BS	(0.0472)	(0.0053)	0.0286
	(0.3600)	(0.0100)	(1.7500)
DI	(0.0270)	(0.1286)	0.0124 **
	(0.8800)	(1.5200)	(1.4800)
FS	(1.6845)**	(1.6593)	(0.2008)***
	(2.8400)	(1.3200)	(2.4000)
LV	(0.0554)	0.0184	(0.0012)
	(1.6100)	(0.1500)	(4.2100)
FP(t-1)	0.4433 **	0.5429 **	0.6500 ***
	(2.4000)	(2.2900)	(0.2100)
Cons	24.1470 **	20.6310	3.0400 ***
	(2.8300)	(1.1200)	(3.8500)
Observations	302	302	302
AR (2)	0.1430	0.6550	0.5210
Hansen test	0.3790	0.5550	0.8510

Z-statistics are in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level.

Source: Own calculations using panel data over the period of 2007 to 2016. Data obtained from Bloomberg online database.

WB1, WB2 and WB3 were calculated as the number of female directors on the board to total directors, formulated as a percentage. With regards to the accounting-based dependent variables, ROA and ROE, the evaluation shows a positive and statistically significant correlation between women on the BOD and FP when the proportion of female directors is between 1% and 20%. A small decrease in the coefficient of proportion of women on the board is seen when the threshold increases to 30% of the board. This confirms that, overall, having women on the boards of listed entities has a positive link with company FP. The small decrease in the coefficient in the relationship with ROA and ROE may indicate that, as the number and participation of female directors grows, communication may become increasingly challenging (Guldiken, Mallon, Fainshmidt, Judge and Clark, 2019). Male directors may also begin to view the increasing number

of female counterparts as a threat. It is imperative to acknowledge that in isolation when analysing a BOD with anywhere between 1% and 30% of female directors, the correlation with FP is positive. The optimal proportion of female directors evident from this study lies between 1% and 20%; however, there was insufficient data to analyse the impact of proportions higher than 30%. It is only recently that boards have opened to ardently including female directors and appreciating that diversity can bring tangible rewards. This shows that women are starting to be accepted beyond superficial motives of merely achieving diversity. To take full advantage of true diversity, boards must make changes to the internal processes. One way to do this is to understand that the tangible payoff comes from integrating the transformation required into the core values of a company by analysing the views of diversity within the existing BOD. It could therefore be that once the proportion of female directors' approaches gender parity and they are accepted as fully-fledged partners, the challenges with integrating diversity will be resolved and this may have an even greater positive impact on FP.

Table 9: Findings to second objective: regression model 3 – The proportion of women on the board and FP when the percentage of the women is up to 20%

	ROA	ROE	Tobin's Q
WB2	3.6946 *	18.9400 *	(0.2202)*
	(1.7100)	(1.6700)	(1.7800)
BS	(0.0472)	(0.0054)	0.0368
	(0.3600)	(0.0100)	(0.7800)
DI	(0.0269)	(0.1286)	0.0076 *
	(0.8800)	(1.5200)	(1.6600)
FS	(1.6845)**	(1.6594)	(0.2570)
	(2.8400)	(1.3200)	(1.6700)
LV	(0.0554)	0.0184	(0.0003)
	(1.6100)	(0.1500)	(0.0400)
FP(t-1)	0.4433 **	0.5429 **	0.5167 **
	(2.4000)	(2.2900)	(3.1700)
Cons	24.1470 **	20.6310	2.7180 ***
	(2.8300)	(1.1200)	(3.3400)
Observations	302	302	302
AR (2)	0.1430	0.6550	0.3330
Hansen test	0.3790	0.5550	0.5820

Z-statistics are in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level.

Source: Own calculations using panel data over the period of 2007 to 2016. Data obtained from Bloomberg online database.

Table 10: Findings to second objective: regression model 4 – The proportion of women on the board and FP when the percentage of the women is up to 30%

	ROA	ROE	Tobin's Q
WB3	3.5287 *	12.9650 *	0.5079 *
	(0.7200)	(0.7500)	(1.2300)
BS	(0.0296)	(0.1641)	0.0435 *
	(0.0600)	(0.4500)	(2.2800)
DI	(0.0417)	(0.1285)	0.0047
	(0.9300)	(1.0600)	(1.2300)
FS	(1.4458)**	(0.6200)	(0.1836)***
	(1.9000)	(0.7200)	(4.3600)
LV	(0.0570)	(0.0354)	(0.0003)***
	(1.0600)	(0.2200)	(0.0500)
FP(t-1)	0.4243 **	0.6618 ***	0.7314
	(2.7400)	(6.4600)	(8.8300)
Cons	25.2260 ***	20.0500	1.5595
	(3.1000)	(1.4300)	(2.5200)
Observations	302	302	302
AR (2)	0.1000	0.3420	0.3360
Hansen test	0.3220	0.4070	0.9570

Z-statistics are in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level.

Source: Own calculations using panel data over the period of 2007 to 2016. Data obtained from Bloomberg online database.

In contrast with ROA and ROE, when analysing Tobin's Q, the results show that at low levels of female representation (below 20%), there is a statistically significant negative relationship. However, when analysing firm performance when the percentage of women is between 21% and 30%, the statistically significant relationship becomes a positive one. There is a negative correlation with Tobin's Q of -1.52% and -0.22% when analysing the less than 10% and less than 20% thresholds respectively. This relationship turns into a positive one as evidenced by a coefficient of 0.51% when the percentage of women is between 21% and 30%. Gender diversity has recently started to attract investors and improve the market value of companies because it is perceived as critical to a company's growth and indicates a company's awareness of governance risks and commitment to progressive gender diversity. Companies typically experience an increase in market value after being recognised for diversity initiatives (De Klerk, De Villiers and Van Staden, 2015). Reguera-Alvarado, de Fuentes and Laffargee (2017) agreed that investors view gender diversity as a positive investment variable. This supports the finding that an increasing the

number of female directors enhances FP when performance is measured using the market-based measure, Tobin's Q. Considering the accounting-based measures, this study concludes that there is in fact a statistically significant and positive relationship between female representation on the board and company FP, thus supporting hypotheses 2, 3 and 4.

Board size and director independence both have a negative correlation with FP when using ROA and ROE as measures. This is in line with the analysis performed in Table 7 and the discussion thereof. However, as evident from Tables 8, 9 and 10, board size and director independence have a positive and statistically significant relationship with Tobin's Q. This indicates that from an investor perspective, board size and director independence are viewed as beneficial to a company's future long-term growth. Boards with greater numbers of directors, particularly independent directors, are seen to be more vigilant in monitoring managerial behaviour (Nguyen et al., 2015). Diversity amongst larger number of directors provides a better link with external resources and increases external wealth (Terjesen et al., 2016).

Firm size presented a negative and statistically significant correlation with ROA, ROE, and Tobin's Q with a maximum coefficient of -1.68, suggesting that larger firms do not improve FP. The above tables reveal a negative and statistically significant relationship between leverage and ROA under all three threshold scenarios. This is in line with the analysis performed in Table 7 and the discussion thereof.

The robust GMM estimation using both ROA and ROE as accounting-based measures and Tobin's Q as a market-based measure of firm performance, shows that the proportion of women on the BOD anywhere between 1% and 30% is positive and statistically significant when measuring the performance of JSE-listed companies in South Africa. The following tests were presented:

- The Arellano and Bond test of autocorrelation errors for autoregressive for ROA, ROE and Tobin's Q results

The results of AR (2) revealed that the *p*-values of the AR (2) test are above .05 which implies that the null hypothesis of no serial correlation could not be rejected (Asafo et al., 2019; Kiviet, 2020). Thus, the results of system GMM using the measures of FP in models 2, 3 and 4 are valid. The

dynamic approach of models 2, 3 and 4 shows that the past firm performance is positive and significant for each threshold analysed.

➤ The Hansen test for overidentification restrictions

The Hansen test for overidentification restrictions and the Arellano and Bond test of autocorrelation errors for autoregressive for both ROA and Tobin's Q were presented. All the Hansen test *p*-values are above .05, which implies that the null hypothesis could be not rejected, and thus, the overidentification restriction is valid.

Table 11 presents the results of model 5, featuring the quadratic term for the women on the BOD variable.

Table 11: Findings of regression model 5 - findings on the relationship between the proportion of women on the BOD and FP with quadratic term square function

	ROA	ROE	Tobin's Q
WB	9.4400 **	2.3426 **	0.8700 **
	(2.0200)	(2.0100)	(1.8300)
WB²	(0.0068) **	(0.0669) **	(0.0009) **
	(1.4500)	(1.9100)	(1.7300)
BS	(0.0127)	(0.3534)	0.0066 *
	(0.1000)	(0.7400)	(0.0098)
DI	0.0281	(0.1070)	0.0049
	(0.9100)	(0.9700)	(0.0042)
FS	(1.7121) **	(1.5668) **	(0.1660) ***
	(4.4300)	(1.9200)	(3.7600)
LV	(0.0623) **	(0.2488) **	(0.0063) **
	(1.6800)	(1.6800)	(1.8100)
FP(t-1)	0.5494 ***	0.8022 ***	0.8192 ***
	(4.0800)	(4.0400)	(9.7700)
Cons	1.8640	(14.6460)**	(0.2114) ***
	(0.1300)	(1.0000)	(0.2000)
Observations	302	302	302
AR (2)	0.2330	0.4960	0.3630
Hansen test	0.7230	0.5090	0.1100

Z-statistics are in parentheses; * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level.

Source: Own calculations using panel data over the period of 2007 to 2016. Data obtained from Bloomberg online database.

The GMM results exhibited that there is significant and positive relationship between woman on the BOD with a coefficient of 9.44 and 2.34 for ROA and ROE respectively. Additionally, the finding exhibits that the proportion of female directors is positive and statistically significantly related to firm performance when using the Tobin's Q market-based measure with a coefficient of 0.87. These findings imply that female directors positively influence the capital market value of JSE-listed companies. A gender-diversified board results in higher FP which is consistent with the agency and resource-dependency theories discussed earlier in this dissertation which indicated that a diversified board results in enhanced innovation, better decision-making and improved allocation of company resources. The significant coefficient of the quadratic term of square function indicates that there is nonlinear relationship between women on the BOD and FP.

The robust GMM estimation using quadratic function for the variable woman on the board is positive and statistically significant when measuring the performance of JSE-listed companies in South Africa. The following tests were presented:

- The Arellano and Bond test of autocorrelation errors for autoregressive for ROA, ROE and Tobin's Q results using the square function of quadratic terms

The results of AR (2) revealed that the p-values of the AR (2) test are above 0.10 which implies that the null hypothesis of no serial correlation could not be rejected (Asafo et al., 2019; Kiviet, 2020). Thus, the results of system GMM using the measures of FP in the models are valid.

The dynamic approach of model 5 shows that the past firm performance is positive and significant on the nonlinear relationship between woman on the board and firm performance.

- The Hansen test for overidentification restrictions

The Hansen test for overidentification restrictions and the Arellano and Bond test of autocorrelation errors for autoregressive for both ROA and Tobin's Q were presented. All the Hansen test *p*-values are above .05, which implies that the null hypothesis could be not rejected, and thus, the overidentification restriction is valid.

Table 12: Findings of model 5 Quadratic function report – the turning points

Firm Performance	The proportion of women on boards and company performance when the percentage of women is less than 20%.
ROA	16.17 *
ROE	12.78 *
Tobin's Q	1 *

* significant at the 10% level based on the t-test.

Source: Own calculations using panel data over the period of 2007 to 2016. Data obtained from Bloomberg online database.

With regards to the accounting-based dependent variables, ROA and ROE, the evaluation shows a turning point of 16.17% and 12.78% respectively between women on the BOD and FP. This was the case when the proportion of female directors is between 1% and 20%. While the market-based measure of firm performance shows a turning point of 1%. The turning point indicates that beyond the 20% threshold of female directors, increasing the number of female directors may not result in any significant improvement in FP. This is consistent with the findings as explained below Table 8. The results are sufficient statistical evidence to support a non-linear relationship between board gender diversity and FP.

4.4. Chapter Summary

Chapter 4 reported the results of the statistical analysis conducted to determine if there is in fact a link between female directors and company FP. The regression analyses conducted revealed a positive association between female directors and FP using both accounting-based and market-based measures. Thus, hypothesis 1 was supported. The results from the study further showed that FP increases at all thresholds examined, especially when the proportion of female directors increases up to 20%. In accordance with the findings of this study, hypotheses 2, 3 and 4 were supported. The evidence provided in this chapter confirms that female directors have the ability to increase FP by providing insightful views to board discussions, creating a positive perception for investors of the company and sustaining a competitive advantage.

Chapter 5 presents the key findings, conclusions and the way forward. It discusses the research limitations and the recommendations for future studies.

CHAPTER 5: SUMMARY AND CONCLUSION

5.1 Introduction

Globally, the role of women on the BOD has become a critical concern. Women represent 49,6% of the world population and yet they are still underrepresented in business leadership positions (Cook and Glass, 2018; Statistics Times, 2021). Whilst there is the matter of gender inequality, the business world is also being deprived of the diverse strengths and benefits which female directors bring to the boardroom. Undoubtedly, women have a plethora of perspectives which can bring great advancements to companies. Recently, particular interest is being given to whether achieving gender diversity at the board level improves an entity's bottom line. The link between a company that has a gender diverse board and profitability proves to be a complex one.

Three theories which attempt to improve the understanding of this relationship are the value maximisation theory, agency theory and resource dependency theory. Based on the value maximisation theory, the primary aim of a company is to maximise shareholder value, therefore companies would support the inclusion of female directors if they believed there to be any potential return. The most widely used theory to study the association between women on the BOD and FP is the agency theory which suggests that when the interests of agents and principals are aligned, agency costs may be eliminated. One way to achieve this alignment of interest is by establishing a more suitable BOD, inclusive of female directors. Gender diverse boards bring new perspectives, ask more probing questions and are seen to be more independent and to implement better board monitoring, thus leading to better FP. Lastly, it is suggested by the resource dependency theory that in addition to being a company resource, the BOD also connects the company to external resources and parties. Female directors bring diverse talents and knowledge to the boardroom as well as expand a company's network and links the company with female stakeholders. The theory implies that directors are selected based on the rationale that they can be a means of obtaining access to crucial resources and connections which has a positive influence on FP. Further, companies who promote gender parity are perceived positively by stakeholders, particularly financiers, consumers and society.

To tackle the issue of boards not being inclusive of female directors, two main approaches have been adopted. One approach is where countries impose gender quotas on companies requiring a minimum percentage of female directors. The other, more subtle, approach is providing companies with recommendations in respect of good governance and disclosure requirements regarding their gender diversity profiles. In South Africa, quotas are thought to be idealistic and instead targets are used to encourage gender advancement. As of 2017, all JSE-listed companies are required determine and set their own board diversity targets. These companies are required to report on their progress towards their targets annually.

This study investigated the correlation between women on the BOD and company FP, specifically the 40 biggest companies on the JSE from 2007 to 2016. Chapter 4 presented the empirical results of the investigation with regards to the investigated relationship. This chapter presents a summary of the research methods used. The findings discussed in chapter 4 are then concluded on. Following this, the limitations of the study and possible areas of future analysis are highlighted.

5.2 Research objectives, methodology and design

This study's research objective was to determine whether there is an association between female representation on the BOD and FP. Further, this study investigated what proportion of females, if any, is the optimal threshold in order to enhance FP.

The 40 biggest companies on the JSE were selected as the sample for this study and included companies across seven sectors (basic materials, consumer goods, consumer services, financial services, healthcare, industrial and telecommunications). The study covered a ten-year period from 2007 to 2016, 14 years post the South African apartheid period. The variables included in this analysis were derived from the collated sample panel data. Data relating to gender diversity comprised the number of women on the board and the total number of board members. The main independent variable was women on the BOD calculated as the proportion of female directors to total directors. In investigating the optimal threshold of female directors, the proportion of women on the BOD was further analysed into three groups, namely less than 10%; less than 20%; and less than 30%. Data relating to company FP comprised each company's profit after tax, total assets (book value and market value) and shareholders' equity. Three measures of FP, namely ROA,

ROE and Tobin's Q were used as the dependent variables. Control variables taken into consideration included board size, director independence, firm size and leverage.

This study applied the dynamic linear regression model with GMM estimation to control for all endogeneity issues relating to women on the BOD and profitability such as unobserved heterogeneity and simultaneity. Diagnostic tests to confirm the suitability of data were also conducted. VIF testing was applied to identify any multicollinearity amongst data. Further, the Hansen test for overidentification restrictions and the Arellano and Bond test of autocorrelation errors for ROA, ROE and Tobin's Q were also presented.

5.3 Key findings and recommendations

The direction of the relationship between female representation on the BOD and a company's FP was as anticipated based on the majority of significant recent literature reviewed (see for example Giraldez-Puig and Berenguer, 2018; Schrand et al., 2018; Scholtz and Kieviet, 2018; Duppati et al., 2020; Brahma et al., 2021). The coefficients for the accounting-based measures, ROA and ROE as well as the market-based measure of FP, Tobin's Q, indicated that women on the BOD is positively and significantly related to FP. These findings imply that the board gender diversity leads to improved company profitability which is consistent with the value maximisation, agency and resource-dependency theories. The theories suggested that a diversified board results in enhanced innovation, better decision making and enriched access to resources. This study therefore concludes that there is a positive and significant correlation between women on the BOD and a company's financial results.

Further, the study categorised female representation into three thresholds, i.e. companies with less than 10% female directors; companies with less than 20% female directors; and companies with less than 30% female directors. The results from the analysis using the accounting-based measures (ROA and ROE) confirm that there is a positive and statistically significant relationship between female representation and FP when there are between 1% and 20% of female directors. Although there is a slight decrease in the coefficient in the relationship between female representation and accounting-based measures when there are between 21% and 30% of female directors, the

relationship between the variables remains positive. This confirms that, overall, having female directors has a positive outcome on listed a company's financial position.

In contrast to the analysis of ROA and ROE, the analysis reveals that when the same test was performed using the market-based measure, Tobin's Q, there is a negative association with FP when the proportion of women on the BOD is between 1% and 20%. However, this relationship turns into a positive one when there is between 21% and 30% of female directors on the board. Market-based results are influenced by the perception of investors. For investors to believe that the company is committed to the advancement of women, there needs to be more than one female director so that she is not viewed as merely a 'token'. A company that is gender diverse is perceived to be committed to good corporate governance, is innovative, and has comparative advantages and growth opportunities.

Given the results of the threshold testing, particularly the correlation amid the accounting-based measures and female directors when the proportion is between 1% and 20%, this study suggests that policymakers should support the inclusion of female directors. Gender quotas have not been well received in South Africa, hence rather than imposing on boards, policymakers need to focus more on encouraging diversity of thought. However, it is concerning that there are companies listed on the JSE that are not yet close to achieving gender diversity. In order to influence all companies to at least begin the diversity transformation process, a minimum of 20% of female directors should be required for all listed companies and for companies to thereafter set out individual strategies to achieve gender equality. As evidenced by the statistical analysis in this study, the average of female directors is 18%, therefore a target of 20% is within reach for companies listed on the JSE.

It is evident from the threshold analysis using Tobin's Q as a measure that shareholders hold companies with gender diverse boards in high regard. Shareholders have the power to encourage change by applying pressure on regulatory bodies as well as through companies directly. They should therefore pay closer attention to the male:female ratio of the board and advocate for greater female representation when they are underrepresented. Further, researchers, media personnel and even social media influencers should continue to publicise the topic of gender diversity. The more

attention the topic receives, the more confident females will be to speak up or even to disagree with the majority. As a result of the wide coverage, men in the workplace will be more aware of the value of women and may support the promotion of females as well as encourage female directors to express their views.

Regardless of whether the outcome of the study indicated a positive or negative correlation between the variables, aiming towards gender parity on boards can be motivated by ethical values. FP should not be the deciding factor in whether there is equal opportunity for both men and women to reach the boardroom. However, as supported by the value maximisation theory, the main objective of shareholders is to maximise profit, which may lead to the ethical values not being given precedence. Therefore, the results of this study promote the business case for the inclusion of female directors as evidenced by the positive coefficients when analysing the accounting-based measures at any threshold of the independent variable. The positive effects on FP together with the ethical perspective presents significant support for the inclusion of women in the boardroom.

5.4 Limitations of the study and directions for future research

There are a few limitations within this study which may present opportunities for future research. Time and resource constraints limited the investigation to the Top 40 JSE-listed companies. As a result, the findings are not generalisable and may therefore not be representative of other medium or smaller sized companies in South Africa. It is however possible that smaller companies may model the structure of the listed companies gender diverse boards and as a result enhance their profitability. These smaller companies also have an impact on the development of South Africa's economy. As such, future studies to determine if more women on the BOD is linked to enhanced financial results for medium and smaller sized companies in South Africa will be a prolific avenue to research.

Further, the study only considered the gender aspect relating to the BOD. Other variables such as education, qualifications, training and capability of the female directors were not considered. There is therefore scope to consider the additional factors in future studies that may enhance the impact of board gender diversity on FP.

Although this research was conducted on data collected from a reasonable period of time since the governments' implementation of the employment equity policies, it is highly possible that female representation in top ranks of companies is still on the rise. Further, in testing the optimal range of female directors required, the maximum threshold was less than 30% as there were very few boards in the JSE Top 40 companies with more than 30% female representation. It is only recently that boards have started actively recruiting females and determining how best to realise the rewards from this diversity. In future, a similar study should be conducted when South African companies reach a point of gender parity. This will provide impartial insight into the optimal proportion of female directors. This shows how women are being accepted beyond superficial motives of merely achieving diversity. To take full advantage of true diversity, boards have to make changes to the internal processes. One way to do this is to understand that the tangible payoff comes from integrating the transformation required into the core values of a company by analysing the views of diversity within the existing BOD.

There is always the possibility of unknown factors having an impact on the dependent variables utilised to measure FP. While previous research and theory were used as a basis to control for as many variables as possible, it is impossible to know whether all the important influences have been controlled for. Additional control variables to consider are firm age, educational level/qualification of board members, age of board members, which were not considered in this study due to time constraints and this information not being easily accessible for the earlier periods analysed. As companies have progressed with regards to the disclosure of information, these variables could be more easily accessible going forward.

Finally, the financial position of a business in line with the value maximisation theory was the focus of this study. However, the success of a business cannot only be measured by profit but should also include their greater contribution to society as explained by the stakeholder theory. There is currently limited evidence which suggests that women on the board occupy a more effective role in managing a company's sustainable activities and therefore assist the company to achieve a higher social standing. It would be appealing for future research to observe the correlation between female directors and non-financial indicators of company performance for

example, business risk, sustainability projects, social issues such as relationships with local communities and environmental issues.

5.5 Conclusion

The international attention that gender diversity receives has filtered into South Africa. The inadequacies in the board structure regarding gender diversity have been highlighted and to address this, key transformations have been included in the King IV report and policy documents. Despite these efforts, the level of board gender diversity is still unacceptably low.

The research conducted in this study supports the argument for gender parity by establishing a link between board gender diversity and the FP of JSE companies. The results from the study indicated that overall female directors positively influence FP. This positive impact appears to peak as the proportion of female directors approaches 20%. The optimal threshold may be higher but this can only be assessed once board gender diversity escalates.

This study is of interest to directors, investors, policy makers, researchers, women advocacy groups and other stakeholders. It contributes to the increasing knowledge relating to the relationship between female directors and a company's FP in developing and developed countries. The findings enhance the existing business case for the inclusion of females in the boardroom, not merely to achieve gender parity but for financial motives as well. This research also encourages prolific discussion about gender equality in the economy.

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APPENDIX A: ETHICAL CLEARANCE



20 August 2018

Mrs Raeesa Dockrat (205501108)
School of Accounting, Economics & Finance
Westville Campus

Dear Mrs Dockrat,

Protocol reference number: HSS/1068/018M

Project title: Women in the boardroom and financial performance: An analysis of JSE listed companies

Full Approval – No Risk / Exempt Application

In response to your application received on 24 July 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Professor Shenuka Singh (Chair)

/ms

cc Supervisor: Mr Alastair Marais
cc Academic Leader Research: Professor Josue Mbonigaba
cc School Administrator: Ms Jerusha Singh

Humanities & Social Sciences Research Ethics Committee
Professor Shenuka Singh (Chair)/Dr Shamila Naidoo (Deputy Chair)
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APPENDIX B: LETTER FROM THE LANGUAGE EDITOR



JEANNE ENSLIN
FREELANCE LANGUAGE PRACTITIONER

Editing certificate

TO WHOM IT MAY CONCERN

I, Jeanne Enslin, acknowledge that I did the language editing of **Raeesa Dockrat's** dissertation submitted in partial fulfilment of the requirements for the degree Master of Accountancy at the University of KwaZulu-Natal.

The title of the dissertation is:

**WOMEN IN THE BOARDROOM AND FINANCIAL PERFORMANCE: AN
ANALYSIS OF JSE LISTED COMPANIES**

All corrections or changes are evident in the version of the dissertation in track changes and with comments for the student's attention.

A the technical editor, Ilse Munnik, checked and corrected all in-text references and the reference list of the dissertation. These corrections are also evident in the version in track changes and with comments for the student.

The quality of the final document, in terms of language, formatting and references still remains the student's responsibility.



Jeanne Enslin
Language editor
082-6961224

21 August 2022.

BA English and History (University of Stellenbosch)
Senior Teaching Diploma (University of Stellenbosch)
Honours in Translation Studies cum laude (Unisa)
Post-graduate diploma in Editing cum laude (University of Stellenbosch)

J H Enslin BA (US); STD (US); Hons Translation Studies (UNISA)

APPENDIX C: TURNITIN REPORT SUMMARY

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