Corporate Governance: Balanced Boards, Board Diversity and Firm Performance

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Abstract

The board of a firm are agents, who act on behalf of the shareholders to monitor performance of the firm, reduce agency costs and take care of their interests, both financial and non-financial. Corporate governance codes such as the various King codes have emphasised the importance of having balanced boards in terms of diversity and the need for increased transformation in the boardroom. There is a growing debate on whether a board that is more diversified impacts the performance of the organisation and the research on the subject of diversified boards and organisational performance have had varied results thus far. This research concentrates on boardroom diversity, specifically in respect of gender, in terms of age diversity, race and board independence and whether these diversity variables have influences on organisational performance, in respect of Tobin's Q and also utilising Return on Assets (ROA). The JSE top 100 firms were analysed for the period 2012 to 2016. Panel data was used and an OLS regression and a fixed effects regression model were utilised. The study concluded that all four board diversity variables have an insignificant impact on organisational performance.

List of abbreviations

IFRS	International Financial Reporting Standards
B-BBEEA	Broad-Based Black Economic Empowerment Act
GDP	Gross Domestic Product
OLS	Ordinary Least Squares
King code	King Code of Corporate Governance (King IV)
ROE	Return on Equity
JSE	Johannesburg Stock Exchange
IoDSA	Institute of Directors South Africa
REIT	Real Estate Investment Trust
PPPFA	Preferential Procurement Policy Framework Act
ROA	Return on Assets

Declaration

I declare this research project is my own work. It is submitted as partial fulfilment of the requirements for the degree of Masters in Business Administration to the Gordon Institute of Business Science, University of Pretoria. It has not been submitted for any degree or examination in any other university. I further declare that I have received the necessary authorisation and consent to carry out this research.

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Chapter 1: Introduction to the Research Problem

1.1 Introduction

Shareholders elect the firm's board as representatives to make most decisions on their behalf and to take care of their interests, be it financial or non-financial (Hart & Zingales, 2017).

A relationship is created where the shareholders of the firm, who are referred to as the principals, delegate authority to the firm's board, who are the agents, for monitoring the organisation's performance and reduce agency costs. The agency theory describes the agency problem which occurs where there is no alignment of the goals of both the agent and the principal, thereby creating agency costs through agents pursuing their own interests (Bosse & Phillips, 2016; Eisenhardt, 1989). Two of the main responsibilities of the board are monitoring activities and involvement in strategic decision making (Post & Byron, 2015). Part of these monitoring responsibilities is accountability for performance of the organisation, as recommended by the "King IV Report on Corporate Governance for South Africa 2016" (IoDSA, 2016).

There has been an ongoing debate on what constitutes an effective level of outside independent quantity of directors to effectively monitor the firm and whether any increase in outside directors would have prevented recent corporate scandals where management had too much influence on the board (Rashid, 2015). The agency problem will therefore be reduced in these circumstances where there is a greater prevalence of independent directors. Thus, countries like the United States of America have encouraged higher levels of independent directors and the United Kingdom suggests at least three independent directors in the Cadbury Report 1992 and a at least 50 percent of the directors to be external as suggested by the Higgs Report 2003, even though there are mixed results on the financial value this provides to the firm (Rashid, 2015).

Demographic diversity brings various perspectives to the boardroom, and is argued to enhance the quality and level of problem-solving within a group, with women particularly having a more stakeholder inclusive approach (Rao & Tilt, 2015). The battle for gender equality and fairness remains to be an issue in recent times and the "Global Gender Gap Report 2015" stresses the importance of having females in senior and

leadership roles and further indicates that there has been a resistance from corporations in transforming into more gender equal companies (Landel, 2016). As more women are graduating from college, this has not translated into increased levels of females in senior leadership roles and according to the World Economic Forum forecast, a period of 118 years for gender pay gap to be minimised is required (World Economic Forum, 2015). Transformation in the boardroom has gained sufficient attention that certain countries are starting to implement quotas of the number of females that must be represented in the boardroom (Wiersema & Mors, 2016).

A balance in terms of age is important to balance the risk appetite of the board and avoids groupthink (Ararat, Aksu & Cetin, 2015).

Different ethnic groups promote an environment of creativity and innovation and are therefore argued to increase firm performance (Andrevski, Shaw, Richard & Ferrier, 2014). These factors reduce the agency problem as they contribute to improved financial performance which is aligned with shareholders' goals.

1.2 King IV Report

There are various codes of corporate governance that exist around the world and the King IV code consists of principles, philosophies, practices and recommendations which are considered good corporate governance as a benchmark in South Africa for organisations to follow (IoDSA, 2016). The definition of corporate governance, according to the report, is ethical and effective leadership in the areas of ethical culture, effective control, legitimacy and good performance. King IV uses the term governing body when referring to the board of an organisation as the body which is responsible for both governance and performance of the organisation (IoDSA, 2016). Principle seven of the Code specifies that the governing body should be balanced in terms of skill, knowledge, diversity, experience and independence to perform its role effectively. Principle two of the Code states that the board should set an ethical culture and its character and behaviour should be such that it leads by example. It follows that transformation and diversity first begin with the board for the organisation embracing these concepts.

For a board to effectively control the company, it requires, amongst its arsenal of skills, the appropriate balance in terms of diversity characteristics and perspectives. In recent

time, a greater deal of attention has been given to diversity in the boardroom in order to obtain the appropriate mix (Subramaniam, 2015; Ferreira, 2015). The exact definition of boardroom diversity is unclear (Hafsi & Turgut, 2013), but according to the King IV Code, diversity refers to knowledge and skills, age, culture, experience, race and gender (IoDSA, 2016). Ararat, et al (2015) describe boardroom diversity as structural diversity, in reference to the quantity of independent members in relation to total quantity of members and demographic diversity, which consists of age, gender, education and ethnicity. The move towards diversity is to encourage different views and perspectives in the boardroom, to identify with a larger variety of customers and to better innovate to stimulate demand in the market (Hill & Davis, 2017).

1.3 Corporate Governance

The various scandals in corporations globally, particularly in companies such as Enron, WorldCom and Tyco, as well as the global financial crisis in 2008 demonstrates why countries are calling for stricter corporate governance requirements as confidence of investors in corporations have declined (Admati, 2017). The agency theory has been evident in the numerous governance failures due to the agency problem of directors pursuing interests of their own instead of that of the shareholders' that give them the necessary authority to govern. Due to this, enterprise-wide risk management has become of increasing importance in recent times. As boards are considered a vital mechanism of corporate governance, the composition of boards has become relevant and topical (Ararat, et al, 2015).

Certain countries have viewed diversity strictly in terms of transformation and have incorporated diversity quotas as legislation, but diversity is largely still voluntary in many countries (Wiersema & Mors, 2016). Thus, much recent research has attempted to find a business case for boardroom diversity to encourage countries to regulate diversity and promote transformation within organisations in areas such as gender and retirement ages (Ben-Amar, Chang & Mcllkenny, 2017). A business case would also motivate firms to follow these voluntary governance codes and this increase transformation.

Part of the agency problem is that it is difficult to measure performance and agency costs of the agent due to information that is imperfect (Bosse & Philips, 2016). The measures often used are either market-based, looking at the share performance or

measures that examine the accounting profitability which includes return on assets (ROA) (Vafaei, Ahmed & Mather, 2015). These measures give shareholders an indication of how the directors are performing from a financial perspective. As King IV specifies that boards are responsible for performance, formal evaluations should be in place to evaluate the level of how well the directors performed. However, market and accounting based measures are some of the ways to measure the financial aspects of performance of the organisation and boards.

1.4 Diversity in South Africa

South Africa is seen as an emerging economy and is evolving from a history of apartheid which enforced racial exclusion, thereby resulting in predominantly white-only boards (Ntim, 2015). The country's past had excluded non-white citizens in almost every aspect of humanity, depriving other ethnicities of equal education, employment, living conditions and healthcare (Gyapong, Monem & Hu, 2016). This discrimination has thus led to largely homogenous boards as non-white races were not given sufficient opportunity to develop their capabilities or advance in corporations up until the 1990's. Furthermore, gender exclusion, largely resulting from cultural beliefs in African countries, meant that women were not advancing as fast as men in organisations (Gyapong, et al, 2016).

In South Africa, after the abolition of apartheid, which ended in 1994, reforms like the "Preferential Procurement Policy Framework Act" (PPPFA), the "Broad-Based Black Economic Empowerment Act" (B-BBEEA), the "Employment Equity Act" and the various King codes, including the King IV report on corporate governance, have attempted to rectify the diversity issues that the country has faced (Ntim, 2015). In addition, listed companies, as per the Johannesburg Stock Exchange (JSE) listing requirements, are required to promote gender diversity and report performance against this requirement from January 2017 (JSE, 2017).

Several international studies have yielded contradictory results attempting to link the various board characteristics and organisational performance (Post & Byron, 2015, Gyapong, et al, 2016). A few studies have been concluded locally focusing on either various sample sizes, or specific sectors and testing different aspects of board composition and diversity (Muchemwa, Padia & Callaghan, 2016; Ntim, 2015). Due to the contradictory results thus far, empirical research is required to support a business

case for having balanced boards by understanding to what extent these balanced boards are associated with the performance of the organisation (Vafaei, et al, 2015).

1.5 Objective of the research

This research aims to determine if there is a link between balanced boards, from the definition advanced by King IV, and firm performance. On 1st November 2016, the King IV report was available and has been decisive in its recommendations in relation to boards, their composition and their performance, amongst the many items regarding boards. This research specifically concentrates on the independent variables which are age, race, gender and independence and determines whether these four variables significantly influence the performance of the company by using common performance measures which are ROA, as a historical measure (García-Meca, García-Sánchez & Martínez-Ferrero, 2015; Liu, Miletkov, Wei & Yang, 2015), in addition to Tobin's Q, which is generally used to measure the market-related performance. The South African based Johannesburg Stock Exchange (JSE) top 100 listed firms were used in this research. The JSE is ranked 19th globally and is Africa's largest stock exchange, based on market capitalisation (JSE, n.d.). The JSE top 100 companies represent approximately 95 percent in terms of market capitalisation of all firms that are listed on the JSE (JSE, 2015).

In order to be listed on the JSE, there are a number of listing requirements that a company needs to adhere to. The JSE has followed many countries globally by now requiring companies to report on measures used to promote gender diversity on boards with effect from January 2017. In addition to this, the JSE also requires policies promoting racial diversity in the boardroom to be disclosed in annual reports from June 2018 (JSE, 2017). These requirements are consistent with recommendations of King IV for a more balanced and diverse board. These aspects have, to date, not been explored to the extent proposed in this research.

Although similar research has been undertaken in South Africa on various aspects of diversity, research using a regression on these four independent variables, combined together with a large representative sample such as the JSE top 100 companies, using both ROA and Tobin's Q, has not been carried out to date that the researcher is aware of. Both the measurements of firm performance have been widely utilised in recent international and local research. A five-year period from 2012 to 2016 was used in the

analysis (Ntim, 2015).

1.6 Previous research

1.6.1 International studies

Some of the significant international research on diversity in the boardroom and organisational performance in the past five years consist are detailed below together with any possible shortcomings.

2014

Andrevski, et al (2014) studied the influence of ethnic diversity on company performance, utilising competitive intensity as a mediator. The researcher concluded that racially diverse managers have greater competitive advantage and intensity through a diverse knowledge base and information, enhanced creativity and innovation and increased flexibility. These advantages increase gain in market share leading to better firm performance, which was more prevalent in high growth environments. The study was however carried out on managers rather than the board.

2015

The influence of diversity in respect of gender on organisational performance in Singapore, Hong Kong, Malaysia and South Korea was found a positive relationship when using two years of data of corporations on the stock exchange and Return on Equity (ROE), in a study by Low, Roberts and Whiting (2015). Further to this, the researchers found that in countries where there is an increased level of female economic participation, these positive effects were reduced, possibly due to tokenism, and forced quotas imposed in those regions where cultural resistance was strong. Considering the cultural differences between Asia and Africa, the results may be different and cannot be generalised.

García-Meca, et al (2015) researched the impact of nationality and having more females in 159 banks across nine countries between 2004 and 2010. The research found that having more women resulted in a positive influence on bank performance but there was a negative influence by nationality on bank performance using Tobin's Q

and additionally utilising Return on Assets (ROA). This was, however, specific to the banking industry and results may be different if tested in other industries.

A meta-analysis analysis performed by Post and Byron (2015) on the influence of the quantity of women in the boardroom and the organisation's performance and found mixed results from the existing literature. Their research, using 140 previous studies, found that when using accounting based measures, there was a positive relationship, particularly in countries where shareholder protections were greater. However, the effect of having more women was insignificant on organisational performance when utilising market based measures. The research also concluded that a positive relationship exists with women board members and strategy and monitoring, which are key responsibilities of the board. The varying results highlighted in previous studies and particularly the different results when using accounting versus market measures indicate that further research needed to be carried out in this field.

Liu, et al (2015) researched companies in China for a 13-year period beginning 1999, and the influence of external (independent) board members on the organisation's performance. It was concluded from the research that a positive association existed between the quantity of outside members and company performance. In addition, the impact was stronger in firms that were government-controlled. Only accounting based measures were used in this study, and no indication of the relationship with market measures due to China undergoing reforms in the stock ownership during this period, was explored.

2018

Talavera, Yin and Zhang (2018) researched the effect of age and gender diversity in 97 listed Banks in China between 2009 and 2013 and found a negative association existed between diversity in terms of age and organisational performance. It was further concluded that the association was positive between the quantity of women and organisational performance. The study was particular to the banking sector and may not be generalised to other industries. The research used ROA and ROE as accounting-based measures and have not tested the robustness of these through market-based measures.

There are several other international studies conducted on board diversity, such as Ali, Ng and Kulik (2014), Kaczmarek, Kimino and Pye (2014), Vafaei, et al (2015) and

Ararat, et al (2015). Many of the past studies were on developed markets or emerging markets outside Africa.

1.6.2 African studies

African studies are much more limited in the past five years. The following is a summary of certain studies conducted in Africa:

2015

Ntim (2015) studied what the effect of ethnicity and diversity in respect of gender was on organisational performance using 169 JSE listed entities. The study determined the association between diversity and organisational performance to be significantly positive when using market values. The sample used was between the years 2002 and 2007. Transformation in South Africa in terms of diversity and balanced boards has continued to be a concerning issue and has thus had much more focus in King IV and the JSE listing requirements, particularly with regards to gender diversity. The B-BBEEA which was amended in 2013 and effective from October 2014 requires listed companies to report on compliance of the Act (Dti, 2014). In addition to this, are the improvements to the JSE Listing Requirements in recent years, as well as the publication of King IV (IoDSA, 2016). Considering the intensified focus on transformation, it therefore becomes important for a more recent study to be conducted after the period 2007.

Taljaard, Ward and Muller (2015) researched the influence of diversity in respect of gender, average age in the boardroom and race diversity on the organisational performance. The research was performed using the "JSE top 40 listed companies" from 2000 to 2013 using share price performance to determine organisational performance. The study concluded that no association existed between diversity in respect of age and share price performance of the firm, but younger boards are associated with better organisational performance, whilst gender diversity positively influenced share price performance. The authors suggested the need for larger sample sizes, longer periods, increased number of diversity variables and further measures of firm performance in addition to share performance, for future research.

2016

Muchemwa, et al (2016) conducted research on JSE listed companies from 2006 to 2012 on the impact of the structure of the board and size on the organisation's performance utilising Tobin's Q, and testing the robustness with ROE, and ROA. The researcher determined that the influence of the percentage of independent directors on organisational performance was insignificant. The influence of board size was also concluded to be insignificant on organisational performance. These results are contradictory to the emerging markets research concluded by Ararat, et al (2015) who found the percentage of independence is positively associated with increased market performance. Muchemwa, et al (2016) suggests further research be conducted on board structure due to insufficient research that exists on the topic and that other diversity variables be included, such as age, tenure and gender to determine the key drivers of firm performance.

Gyapong, et al (2016) conducted similar studies to Ntim (2015) researching whether gender diversity and diversity in terms of ethnicity has an influence on organisational performance. The researchers found that the influence was significantly positive of both racial diversity and gender diversity on performance. The researchers however, only used market-based measures and have not tested the data against accounting measures. The result on ethnic diversity is different to earlier studies conducted by Taljaard, et al (2015).

2017

The unpublished work of Lalloo (2017) used companies classified as Real Estate Investment Trusts (REITs) that were JSE listed to study if the independence of directors and size of the board had any influence on the REIT's performance. The research determined the influence of the independence of directors on the REIT's performance to be positive, but it was however negative with board size and performance of REITs. The research was industry specific and therefore a limited sample size was used and cannot be generalised to all companies, as stated by the researcher.

1.7 Motivation for the research

This study's purpose is to make a contribution to existing research by validating whether board diversity makes business sense in order to encourage companies to comply with the governance recommendation. The study serves to gather evidence to support the agency theory that when shareholders and board goals are aligned in terms of firm performance, the agency problem and agency costs are reduced, thereby increasing firm performance. Evidence is required to support the notion that a diverse board can contribute different perspectives and innovation that ultimately increases the organisation's performance. The need for diversity and transformation has become increasingly more important in countries around the world and international corporate scandals have made the focus on corporate governance more relevant. This study is motivated by the gap that exists due to the contradictory results in the field of diversity of the board and performance of an organisation, as described in the upcoming literature review to date.

1.8 Conclusion and upcoming chapters

Demographic diversity enhances creativity and innovation and this could drive increased financial performance. Structural diversity supports the improved monitoring skills of the boards as well as brings a valued complexion of issues for board debate and discussion and could also increase firm performance. Thus, both forms of diversity support the agency theory by reducing the agency problem of misalignment of shareholders' and directors goals. Diversity has become imperative for transformation and a business case is required to motivate companies to comply with governance codes. However, there has been conflicting results to date that confirms the need for a study of this nature. Many of the previous studies suggest that future studies be carried out in terms of boardroom diversity and company performance.

The remainder of this document comprises of a literature review explaining the agency theory and the various constructs used in this research, together with the hypothesis, an explanation of the methodology used, results and discussion thereof, implications for management and limitations of this study.

Chapter 2: Literature review

2.1 Introduction

Corporate governance has a broad definition as a system where companies are controlled and is the responsibility of the directors, who are given authority by the owners of the firm, who are the shareholders, to monitor the management and oversee the organisation (Tihanyi, Gaffin & George, 2014).

The board is therefore responsible to account to shareholders on the performance of the company and for decision-making that is best for the organisation and the stakeholders. A key feature of corporate governance codes, such as King IV and new diversity regulations in various countries in recent years, has been the emphasis of diversity in the boardroom, both for purposes of transformation and as a mechanism to avoid future corporate scandals (Gyapong, et al, 2016). Thus researchers have been trying to establish if diversity in the boardroom is related to better financial performance.

A number of studies on diversity of boards and organisational performance have utilised the agency theory in an attempt to understand the board's (agent's) relationship with its shareholders, who are referred to as the principals (Rashid, 2015). The agency theory is centred on the agency problem where managers are susceptible to self-serving behaviours as they obtain more control of the firm, which increases agency costs (Bosse & Philips, 2016; Eisenhardt, 1989). Thus corporate governance measures need to be in place to reduce this type of behaviour and ensure that directors' goals are aligned their goals with that of shareholders, which is profit maximisation (Bosse & Philips, 2016).

This section will explain the agency theory and its role in corporate governance. The relevance of corporate governance codes such as King IV and the requirement of balanced boards will be explained. The section will further provide reviews on previous literature on matter of diversity in the boardroom, and organisational performance and arguments for including independence, gender, age and race as the constructs in this research.

2.2 Agency Theory

The agency theory depicts a relationship in place where the shareholders (principals) delegate authority of monitoring the management in an organisation to the directors (agents) of the company (Rashid, 2015). Jensen and Meckling (1976) call this affiliation as an "agency contract" that exists between the owners of the firms and the agents, for the performance of some service, where the owners delegate the authority to the agent to make decisions in the organisation.

The agency problem exists where the shareholder's goals, which is profit maximisation, and goals of the directors are not aligned, and it is not easy for the shareholders to actually authenticate the performance of the agent, due to information not being readily available to the shareholders (Bosse & Philips, 2016, Eisenhardt, 1989). Thus, firm financial performance becomes an important measure of the agent's performance, as the information is readily available. Directors can improve financial performance through adequate monitoring, strategy and reduction of agency costs (Ararat, et al, 2015). Governance mechanisms need to be in place to try and mitigate the risk of the agency problem and boards are a critical governance control (Ararat, et al, 2015).

2.3 Corporate Governance and Balanced boards

Corporate governance refers to tools, procedures, processes by which a firm is controlled and directed and is the responsibility of the firm's board, who are elected by the shareholders to govern, make strategic decisions and monitor management of the company (Tihanyi, et al, 2014).

Corporate governance codes indicate that diversity and balance in the boardroom is an important governance control (Gyapong, et al, 2016). A more diverse board will be better equipped with knowledge and diverse perspectives and this has the ability to contribute positively to decision-making and to the organisation's performance (Adams, de Haan, Terjesen & van Ees, 2015). Thus, with better decision-making and monitoring from a more diverse board, the agency problem will be reduced through improved performance of the company. In this regard, understanding the link between various characteristics of a balanced board that could contribute to performance of the

organisation is important to align the goals of shareholders and directors.

Corporate governance mechanisms, therefore, attempt to reduce the agency problem through more effective monitoring activities of the board and diverse perspectives in the boardroom. Governance codes which include the various King codes in South Africa, evolving from King I which came into existence in 1994 and enhanced with King II which was in place from 2002, and then King III, which was available from 2009, have attempted to promote diversity even though actual quotas are not stated as in certain regulations in developed countries (Gyapong, et al, 2016). King IV defines balanced boards as having the appropriate mix of skills, age, culture, experience, race and gender and board diversity is one of the key issues of this code (IoDSA, 2016).

2.4 Board diversity

There has been an increasing focus on board diversity and countries which include the US and those in the European Union require organisations to disclose their contribution towards this issue, including reporting on consideration for diversity in the selection process of their directors in the US (Harjoto, Laksmana & Lee, 2015). There are three types of diversity according to Adams, et al (2015), these include structural diversity, diversity that is task-related and non-task-related diversity. Structural diversity refers to independence of directors and duality of CEO and Chairman, whilst task-related diversity refers to skill and education, and diversity that is non task-related comprises of age, ethnicity, gender and nationality.

Boardroom diversity and organisational performance have yielded conflicting results in previous studies (García-Meca, et al, 2015; Ntim, 2015). The rationale for choosing the variables of gender, age, independence and race as predictors of organisational performance was the contradictor results that were concluded in previous studies as discussed below.

2.4.1 Gender

Women require more representation on boards and voluntary corporate governance mechanisms have still only resulted in 18.7 percent of female representation in the Fortune 500 companies (Wiersema & Mors, 2016). Several countries have made a minimum representation of females a legal requirement and according to Adams, et al,

(2015), 14 countries have gender quotas and 16 countries have codes on gender. King IV and its preceding reports and the listing requirements of the JSE have both called for the promotion of gender diversity in South Africa. Thus, both internationally and locally, the importance of female board representation is being stressed and a business case needs to be made to compel companies to comply. Thus, links between gender diversity as a predictor of firm performance becomes an important factor in the fight for gender equality to motivate companies to comply.

There have been contradictory results in previous studies attempting to confirm the relationship that gender diversity has with firm performance (Abdullah, Ismail & Nachum, 2016). In certain previous studies, it was found that the association that exists between having more females on the board and organisational performance is positive (García-Meca, et al, 2015; Ntim, 2015). Garcia-Meca, et al (2016) argue that women on boards increase governance in an organisation and their characteristics are unique which provide increased value to an organisation. Women possess diverse skills obtained from non-work related situations that they are able to bring into the boardroom for a more collaborative decision-making process, which could ultimately enhance firm performance (Post & Byron, 2015). Kim and Starks (2016) show that female dominant expertise such as Human Resources, Sustainability, Risk Management and Politics are often missing from boards and these skills will enhance important advisory effectiveness, which will enhance firm value. Post and Byron (2015) suggest that more women in boardrooms enhance the consideration of all stakeholders and increases in-depth discussions, thereby improving monitoring capabilities of the board. Female board members also increase perceptions of trust and legitimacy from shareholders as shown by Perrault (2015). Better advisory and monitoring suggests that the agency problem will be reduced due to increased profit which aligns the directors and shareholders goals.

In African countries such as South Africa, the gender diversity problem is intensified due to certain cultural beliefs which meant that women have had to fight harder for their positions in both society and organisations (Gyapong, et al, 2016). This suggests that women are tenacious and value their positions on the board once achieved. Thus, the recommendations of King IV of boards being balanced in terms of gender becomes a vital corporate governance tool that reinforces the importance of gender diversity.

However, in other research, an increase in the quantity of females was determined to have a significant negative influence on the organisation's performance due to lack of

experience (Adams, et al, 2015; Abdullah, et al, 2016). There have also been studies which have found that influence was non-existent of appointing more women in the boardroom on the organisational performance (Post & Byron, 2015).

The varied results to date and the importance of gender diversity as suggested by corporate governance codes are important reasons for the inclusion of this variable in this research. Transformation in the boardroom in terms of gender is essential and finding a business case would help motivate firms to comply with voluntary governance codes.

2.4.2 Race

Race has traditionally been associated with biological differences and the colour of one's skin, usually categorised as whites and non-whites (Richeson & Sommers, 2016). Due to colonisation, racial discrimination has been a critical issue around the world, with historical disparities in health, education and living standards, even though in countries like the US, previous minorities are increasing at a rapid rate and may represent 50 percent of the population by 2050 (Richeson & Sommers, 2016).

Certain international studies have shown that racial diversity, which is having the appropriate representation of various races on the board, increases firm performance as it increases the ability to be more innovative, creative and competitive as these diverse races bring in different perspectives to the boardroom (Andrevski, et al, 2014). Emerging market economies such as South Africa, with diverse ethnic backgrounds, historical segregation and with unique transformation initiatives and regulations may yield different results from developed economies (Ntim, 2015). However, research by Ntim (2015) confirms results of the aforementioned international studies that diversity in terms of race in a South African context and firm performance has a positive relationship and racial diversity yielded better performance than gender diversity. The study by Ntim (2015) however covers periods prior to reforms and corporate governance reports which include the amended B-BBEEA, King III and King IV and more recent research is necessary to confirm the extent to which transformation initiatives with regards to race are associated with firm performance. Due to regulations such as the B-BBEEA, the South African government tends to support the issuing of contracts to companies that comply with the Act and the guidance of corporate governance reports thereby increasing profits of the company (Ntim, 2015). The

creativity, innovation, diverse perspectives of various races on the board and being awarded government contracts suggest that financial performance will be improved and thus reduces the agency problem.

Race and firm performance, both internationally and locally, has rarely been studied (Andrevski, et al, 2014; Ntim, 2015). As in the case of gender, having racial diversity in executive positions may be viewed as tokenism (Cook & Glass, 2014) and thus it becomes important to determine if racial diversity on boards is an actual predictor of firm performance as this would encourage compliance with regulation and best practice governance codes.

In South Africa, King IV and the Black Economic Empowerment Act stress the need for racially diverse boards and organisations, coming from a history of apartheid and oppression of non-white citizens (Gyapong, et al, 2016). King IV, however, is a code of good corporate governance that is not compulsory and still voluntary and a business case therefore needs to be made for transformation to occur more rapidly. Due to lower levels of education, and limited economic and employment opportunities of non- white South Africans, there is an insufficient representation of other races on boards (Gyapong, et al, 2016).

Transformation has become increasingly of greater importance globally and boards need to be more representative of the country's citizens. This study becomes important due to the absence of research dedicated to the degree to which an ethnically diversified board influences the organisation's performance to encourage the increase of transformation and reduce the agency problem.

The lack of research on race diversity and the need for a more recent study in emerging markets such as South Africa after initiatives such as King III is the rationale for including race diversity in this study.

2.4.3 Age

Younger directors are more enthusiastic, take more risks, and are more energetic compared to older directors who are far more experienced and cautious and a balance needs to be found between young and old directors to avoid a situation of groupthink

(Ararat, et al, 2015). King IV also recommends a balance in terms of age as a measure of good corporate governance. Some countries have started regulating retirement ages and other areas such as gender to ensure that there is a balance in the board in terms of age and gender (Ben-Amar, et al, 2017). The conflicting results from the studies below demonstrate that further research is required to promote age diversity in the boardroom as good corporate governance.

Wellalage and Locke (2013) found that although ethnicity and age increase firm performance, both education and gender decrease firm performance. Other studies such as Ali, et al, (2014), found that the more diverse the board is in respect of age, the lower the performance of the organisation when using ROA. Talavera, et al (2018) concluded the influence of diversity in respect of age on organisational performance was negative in the banking sector and this was due to the board being divergent in their thinking and unable to function as effectively as boards with less age diversity. Their study further indicates that age diversity has been rarely researched, even though age is an important dimension of diversity, especially in countries that have been through major transformation, as directors' values are synonymous with the era they grew up in. Thus, age diversity can have both positive effects such as creativity and negative effects where different views could cause disruption and reduce efficiency of the board and therefore have consequences on decision-making and performance.

There is no clarity on the effect of having a balance in respect of age and therefore this research attempts investigating whether the influence of age in the boardroom on organisational performance is significant. This will reduce the agency problem and encourage balanced boards as per corporate governance codes such as King IV. Further rationale for the inclusion of age diversity is that there has been a lack of research on this variable and firm performance.

2.4.4 Independence

Independence, according to King IV, is defined as having no affiliation, interest or any relationship that will unduly influence decisions made (IoDSA, 2016). The definition used by Chen, Chen and Wang (2015) extends the King IV definition by including independence as not being employed by the organisation. Due to numerous corporate scandals which resulted in performance failures, countries such as the US require a majority of independent directors for listed companies as approved by the Securities

and Exchange Commission to enhance board monitoring and improve financial reporting (Chen, et al, 2015).

As previously mentioned, the agency problem exists where goals of shareholders and directors are not aligned and where directors engage in self-serving behaviours. The presence of independent directors attempts to solve this agency problem as independent directors wish to increase their reputation through more effective monitoring (Ararat, et al, 2015).

Structural diversity, which includes independence of directors and duality of CEO and the chairman roles have been found to increase firm performance in several studies (Tulung & Ramdhani, 2018; Liu, et al, 2015). Ararat, et al, (2015) found that in emerging economies where structural diversity is weak, independence of directors enhances the market performance of the organisation, but had a negative relationship with accounting profitability when using return on equity (ROE) as a measure. Muchemwa, et al, (2016), in contrast, in their research concluded the association between independence and organisational performance to be non-significant. The researcher suggests further research be undertaken due to a lack of present studies.

Liu, et al, (2015) suggested explanations for positive relationships between the quantity of outside board members and organisational performance was due to the ability of outside board members to prevent self-dealing of executive directors and improved investment efficiency through better monitoring. The researcher further suggests reasons for mixed results and the negative relationship found in certain studies could be attributed to lack of information of external directors and that inside board members generally were found to have increased amounts of company-specific expertise.

Corporate governance initiatives such as King IV stress the importance of a balance between independent and dependent directors. The percentage of independent directors to firm performance therefore needs to be studied further especially in emerging markets, where structural diversity is weak.

The contradictory results and the lack of sufficient studies is the rationale for including independence as a variable in this study.

2.5 Firm Performance

Firm performance can be measured based on how well the shares perform in the market and thus a market-based measure has been utilised by several researchers called Tobin's Q (García-Meca, et al, 2015; Perryman, Fernando & Tripathy, 2015; Vafaei, et al, 2015). A second measure, Return on Assets (ROA) has also been utilised extensively to measure profitability of firms which is essentially the accounting performance in its year-end financial results (García-Meca, et al, 2015; Liu et al, 2015). ROA is an historical measure of how the firm has been performing. The use of ROA is to test the robustness of Tobin's Q, and therefore both measures are often used together as a measure of the performance of the company and thus considered most suitable in this study.

2.6 Recent South African studies

Ntim (2015) found that a more diversified board, when using gender and ethnicity as diversity measures, has a significant positive impact on organisational performance utilising stock market data. The study was based on 169 JSE listed entities measured over a period of five years using market valuations and the findings were consistent with both resource dependence theory and agency theory. Ethnic diversity was found to impact stock market performance more than having higher female representation on boards. In other research, racial diversity in respect of ethnic minorities as well as gender was positively influenced the performance of the organisation and the association was significant (Gyapong, et al, 2016). Further to this, the researchers reported that racial diversity was of more value in better governed firms than gender diversity. This research was conducted on 245 listed firms for a period of five years. The shortcoming of these studies is that accounting performances were not used in addition to market performance to confirm the strength of the market-related measure and only measures two aspects of board diversity which is race and gender. There have also been governance codes such as King III and the amended B-BBEEA since these studies and more recent research is required.

Taljaard, et al, (2015) found that association that exists with racial diversity and organisational performance was not significant. The researchers however, identified solid associations between both greater levels of gender diversity and lower diversity in terms of average age of the board and share price performance. The research used

the JSE top 40 largest listed firms from 2000 to 2013 and share price was the dependent variable that was utilised. This research contradicts that of Ntim (2015) and Gyapong, et al, (2016) in terms of racial diversity. The authors suggested future research with a higher number of sample sizes and inclusion of more diversity variables and more measures of performance. Further to this, only the share price was used as a measure of performance.

Due to mixed results and different measures of performance, this study includes both a market-based measure and an accounting based measure, similar to those used in various international studies.

Board independence and organisational performance was found to have a positive relationship by certain researchers such as Lalloo (2017) which confirms the agency theory indicating that the quantity of outside board directors improve monitoring aspects which are required from the board. The unpublished Masters research of Lalloo (2017) was limited to the 33 Real Estate Property Investment Trusts (REITs) in and could not be generalised to other industries. Muchemwa, et al, (2016) on the other hand, found that independence had an insignificant contribution to firm performance, using all JSE listed firms from 2006 to 2012 and three different ratios to measure of organisation's performance, which comprise of Tobin's Q, ROE and ROA. The researcher suggested future research to be conducted with more diversity variables. The contradictory results and the need for more recent research than Muchemwa, et al, (2016), and covering longer periods and larger samples than Lalloo (2017) is thus necessary. Corporate governance and the need for more independent directors are becoming more critical due to the increasing number of corporate scandals which increases agency costs.

Studies in South Africa, Africa and emerging markets have been limited and researchers suggest results may be different to developed countries (Ntim, 2015). Recent South African research has had varied results similar to international studies and this research is attempting to address the limitation stated in certain previous research which are small sample sizes, single performance measures and single year studies and also bringing in more recent data since King III and the amended B-BBEEA in 2013.

Appendix 1 summarises recent studies, within the past five years, that have been conducted in respect of the age diversity, gender diversity, racial diversity or

independence, as used in this research and their impact on the organisational performance, which is measured by one or more of ROA, ROE, Tobin's Q or share price performance. This table re-iterates the mixed results to date and re-enforces the need for future studies of this nature.

2.7 Conclusion

The common theme in both international and local studies is that boards are agents of the firm and are responsible for firm performance. Good corporate governance requires a balance in terms of age, independence, race and gender amongst various other diversity variables. Focus on board diversity has become an increasing concern internationally (Ferreira, 2015) and this supports both good corporate governance and transformation initiatives.

Several researchers have attempted to support the agency theory by researching the impact of diversity in the boardroom on the organisational performance. The theory suggests that enhanced monitoring and better decisions will address the agency problem where there are similar goals of both directors and shareholders. Diversity, which is non-task-related variables such as gender, age and racial/ ethnic diversity may stimulate creativity and improve decision-making and structural diversity such as independence of directors may increase monitoring capabilities of the board, all of which should increase firm performance. However, international and South African studies have yielded a variety of contradictory results thus far on the extent to which board diversity predicts firm performance. Corporate governance codes such as King IV and its preceding reports in South Africa and some international regulations have attempted to increase board diversity and encourage transformation. To encourage business to embrace transformation initiatives, a business case demonstrating how these variables add value to firm performance must be made (Vafaei, et al, 2015).

Chapter 3: Hypothesis

Due to contradictory results in previous research of the variables used in the study, additional research is necessary to prove the association of Board diversity comprising of gender, age, race and independence with firm performance. Using the literature review, the research problem of finding a business case for a more diversified board which would reduce the agency problem can be restated with the hypotheses that follow.

Gender

H0: The impact of diversity in respect of gender in the boardroom on organisational performance is not significant.

H1: The impact of diversity in respect of gender in the boardroom on organisational performance is significant.

Race

H0: The impact of diversity in respect of racial diversity in the boardroom on organisational performance is not significant.

H1: The impact of diversity in respect of racial diversity in the boardroom on organisational performance is significant.

Age

H0: The impact of diversity in the boardroom in respect of age on organisational performance is not significant.

H1: The impact of diversity in the boardroom in respect of age on organisational performance is significant.

Independence

H0: The percentage of board independence has an insignificant impact on organisational performance

H1: The percentage of board independence significantly impacts organisational performance.

Board Diversity

H0: The impact of the combined gender diversity, race diversity, age diversity, percentage of independent board members on organisational performance is not significant.

H1: The impact of the combined gender diversity, race diversity, age diversity, percentage of independence on the performance of the organisation is significant.

The four independent variables will together be tested against organisational performance to assess the effect of diversity using regression analysis.

Chapter 4 : Research methodology and design

4.1 Choice of methodology

The type of research philosophy used was positivism. Positivism refers to a scientific method to understand how society operates and is generally quantitative, highly structured so that it can be replicated, uses statistical analysis and the researcher is independent of the research, using facts to observe a social reality (Dudovskiy, 2018). Secondary data was collected that is quantifiable in this research and statistical analysis was performed based on objective and factual data from Annual Financial Reports, void of human subjectivity, similar to studies carried out by Ararat, et al, (2015) and Gyapong, et al, (2016). Therefore, by its nature of being quantitative, positivism was applicable to this research.

The approach used was deductive. The deductive approach is explained as an approach using existing theory to then develop hypotheses that were tested for an influence of the independent variables which are age, gender, race and independence on the dependent variables which are Tobin's Q and ROA, which could be measured quantitatively to be able to generalise by using an appropriate sample (Dudovskiy, 2018). In this research, existing theory, which is the agency theory, which explains that the objectives of shareholders and directors of profit maximisation needs to be aligned, has been utilised to develop a set of five hypotheses to test the influence of boardroom diversity on organisational performance. One of the objectives of the research was to confirm the agency theory as conducted in research by Rashid (2015) and Muchemwa, et al, (2016).

The mono method was used where there is a single method of collection of data and data analysis techniques. This can be either quantitative or qualitative (Saunders & Lewis, 2009). This research only used the quantitative method, using secondary data sourced from existing databases such as published Annual Financial Statements and Integrated Annual Reports on various company websites on which statistical analysis was performed, similar to the emerging market research by Ararat, et al, (2015). Data was hand collected from the publicly available information from the JSE and Annual Reports of the JSE top 100 listed companies (Gyapong, et al, 2016). The quantitative method was chosen as accounting data from Annual Reports and data from the JSE are numerical in nature and statistical analysis could be performed to ascertain the effect of boardroom diversity on organisational performance.

The research design purpose was descripto-explanatory as historical secondary data was analysed to obtain descriptive information and then explain the association between the explanatory and dependent variables (Saunders & Lewis, 2009). This study produced descriptive information and found the effect of the relationship of boardroom diversity on the organisation's performance (Perryman, et al, 2016).

The research strategy was to collect secondary data from publicly available Annual Financial Reports of companies for information on the board and accounting data required for firm performance (Ararat, et al, 2015) and share price information and JSE top 100 largest company information that was received from the JSE (Gyapong, et al, 2016). The data was collected from a variety of publicly available documents such as Annual Reports and company websites and lends itself to archival research strategy (Ali, et al, 2014). The data was manually captured into Microsoft Excel spreadsheets from these existing databases and then into Stata once collated. Financial ratios were calculated in Excel and the change from year to year was then entered into Stata as panel data which was used to perform statistical analysis to determine if diversity of the board predicts organisational performance.

A longitudinal time horizon is where more than one year of data is analysed. This research analysed data collected for a period of five years similar to the research of Ntim (2015). The data range was from 2012 to 2016 in which the Board diversity characteristics, financial and market related data were manually sourced and is consistent with several other relevant studies that have used longitudinal time horizons including Perryman, et al (2016), and Liu, et al, (2015). The true outcome of corporate governance reforms such as the King Reports and changes in the board will only be realised in the years that follow and therefore a longitudinal study yields robust information. The period under review coincides with the King III report.

The procedure used was manual but structured collection of director information which is gender, age, race and independence from Integrated Annual Reports and accounting information for ROA and Tobin's Q data retrieved from published Annual Financial Statements from company websites. Share price information was received from the JSE through a request for information submitted to the JSE via email (Gyapong, et al, 2016). The technique used was statistical analysis on Stata by conducting a regression analysis to test the various hypotheses.

4.2 Population

The population is the segment that is most suited as the primary source data for the research (Dudovskiy, 2018). In this research, the top 100 listed firms on the JSE at each year-end from 2012 to 2016 based on market capitalisation was the population. This is similar to research in Turkey carried out by Ararat, et al, (2015) that used the top 100 firms of the BIST-100 index. Of the total market capitalisation of the entire JSE, the top 100 companies represent around 95 percent and was thus chosen as a fair representation, similar to research on the top 500 ASX listed firms in Australia representing 95 percent of the ASX market capitalisation and was therefore a suitable dataset (Vafaei, et al, 2015).

4.3 Unit of analysis

The unit of analysis was the JSE listed companies that fall into the top 100 by market capitalisation size in the period under review which is 2012 to 2016 (Viljoen, 2016).

4.4 Sampling method and size

Sampling refers to choosing a section of the population to be studied as due to various reasons, the entire population may be impractical to include (Dudovskiy, 2018). The entire population which is the top 100 listed firms appearing on the JSE was tested as it was possible to test the top 100 companies within the timeframe. Firms listed for five years with Annual Reports missing for three or more years were however excluded (Gyapong, et al, 2016). The top 100 listed companies between 2012 and 2016 changed each year with 139 firms appearing in the top 100 over the period. A panel of 96 organisations that was unbalanced over a five-year time horizon remained after excluding firms that were in the top 100 for less than three years and those that had missing financial data for three or more years. Survivorship bias thus exists as only those firms in existence and in the top 100 at December each year for three continuous years or more were part of this sample. The unbalanced panel was deemed appropriate as it is representative of the real world (Greene, 2008) and allowed for both entry as well as exit, accounting for a fair level of disclosure of firm-level heterogeneity (Gyapong, et al, 2016).

4.5 Measurement instrument

There was no measurement instrument used in the collection of the data pertaining to this research. The data was secondary data manually sourced from the JSE and Annual Reports on company websites (Ararat, et al, 2015). The Annual Reports of companies that make up the top 100 listed firms on the JSE were prepared according to the requirements of the "International Financial Reporting Standards" (IFRS) and this therefore ensured consistency across all firms that were listed on the JSE (JSE, n.d.). The Annual Financial Reports have been audited which increased reliability and credibility of the information (Muchemwa, et al, 2016). To increase reliability of the manually collected data, all assets, share price and equity information was cross-checked to the Osiris database, which stores all historical and current financial information on JSE listed companies. As information from the JSE, audited published Annual reports and Osiris corresponded with each other, the information was considered credible and reliable by the researcher.

4.6 Data gathering process

The share information was requested via email from the JSE who provided five years of data from 2012 to 2016. The data pertaining to board diversity, which are age, race, independence and gender of the board and financial data, including assets, equity, and net profit and extraordinary items was manually collected from both Annual Financial Statements and Integrated Annual Reports. Integrated Financial Reports have detailed information on boards that was used for this research. The data was entered into Microsoft Excel where a manual database was maintained with the diversity data and financial data. The Tobin's Q and ROA formulae were calculated in Microsoft Excel. The change from one year to the next was then calculated and captured into Stata for further statistical analysis.

4.7 Analysis approach

Statistical tests utilising regression analysis was used in establishing the influence of the four independent variables of board diversity on the dependent variables measuring organisational performance (Perryman, et al, 2015; Vafaei, et al, 2015). The graphical representation below depicts the flow of data.
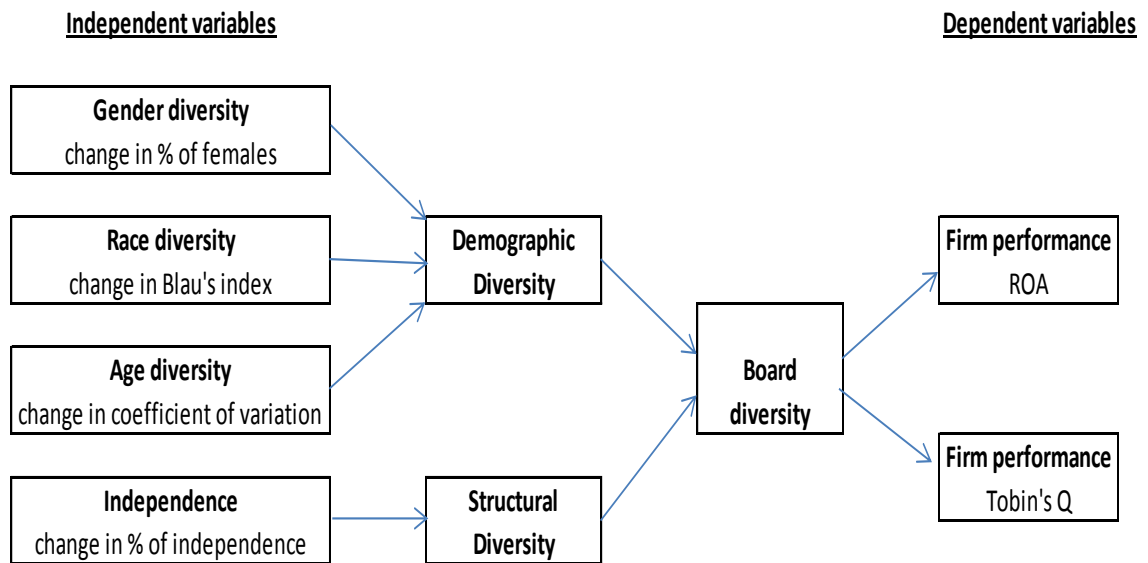
Figure 4.1: Graphical representation of flow of data

Panel data was selected as the most suitable for this research as the data composed of cross-sectional dimensions and time-series elements, obtained for 96 firms over five years. Panel data has the advantages that it is possible to control for "firm-level heterogeneity" (Greene, 2008) and variables contain a lower level of multi-collinearity amongst them (Wooldridge, 2010).

To find the most appropriate and relevant panel model to use, diagnostic tests were carried out. The "Breusch and Pagan LM test" was conducted to choose if a random effects regression model is more suited to the data than the use of the model utilising the Ordinary Least Squares (OLS) (Gyapong, et al, 2016).

Pooled OLS model

The pooled OLS model captures all data, whether it is cross-sectional or time-series data as one large data-set and considers the average variables to be constant across the periods, the disadvantage being that it ignores cross-sectional and time-based aspects characterised by the data (Brookes, 2014). The Breusch Pagan LM test was utilised to ascertain if a pooled OLS regression is a more appropriate model be utilised than the random effects regression model. A rejected null hypothesis of no variances amongst the entities, indicates that the random effects model is preferable (Gyapong, et al, 2016).

Random effects model

This model assumes the unobserved entity-specific influence to be uncorrelated with the explanatory variables and is a random variable (Greene, 2008).

The Hausman (1980) test can be utilised when using panel data to determine if the random effect or fixed effect model is most suitable to be utilised. If the p-value is found to be significant in this test, then the null hypothesis must thus be rejected of the firm-effects and independent variables being uncorrelated, and therefore the fixed effect model is most suitable (Gyapong, et al, 2016).

Fixed effect model

The fixed effect model removes variables that don't vary over time which are unique features of the firm in order for the net influence of the explanatory variables to be determined, on the dependent variable (Green, 2008).

Multicollinearity, autocorrelation and heteroscedasticity

Several tests were conducted on the data to search for significant levels of autocorrelation, multicollinearity and heteroskedasticity.

Multicollinearity exists when an independent variable is strongly correlated with more than one other independent variable (Hair, Black, Babin & Anderson, 2010). A "variance inflation factor" (VIF) test was run to ascertain what the level of multicollinearity was. Hair, et al (2010) suggests a suitable cut-off with a VIF of 10.

Autocorrelation is when the error terms in a period correlate with that of a subsequent period, implying dependence of the error terms (Baltagi, Song, Jung & Koh, 2007). In Stata, the Woolridge test for first order serial correlation, generally utilised for panel data was run to test for this. If the p-value is significant, the data contain autocorrelation. If autocorrelation is found to be significant, the model chosen needs to be robust against autocorrelation.

Heteroskedasticity is when the errors are not constant across the observations and the variability or scatter of the variable is unequal across the range of observations of the

second value it predicts (Wooldridge, 2010). For panel data, either the Breusch Pagan test or the general heteroscedasticity test can be used. If found to be significant, the model chosen needs to be robust against heteroskedasticity to correct for it by adding the word "robust" to the model in Stata.

4.7.1 The dependent variable

4.7.1.1 Tobin's Q

To quantify company performance, the Tobin's Q calculation was used, which has been widely utilised in recent studies as a market based measure (García-Meca, et al, 2015; Perryman et al, 2015; Vafaei et al, 2015). The Tobin's Q formula is assets (book value) less the equity (at book value) added to equity (market value) and dividing the amount by assets (book value) (García-Meca, et al, 2015).

Equation 1: Tobin's Q

$$\text{Tobin's Q} = \frac{\text{Assets (book value)} - \text{Equity (book value)} + \text{Equity (market value)}}{\text{Assets (book value)}}$$

4.7.1.2 ROA

To test the robustness of Tobin's Q, ROA which is net profit before taking into account any extraordinary items over the average total assets was used (Liu, et al, 2015). The total assets used in the calculation were the average of the assets at the start of the financial year and year-ending value relevant to each financial year. Average assets give a more accurate measure of the assets used to support the operations through that financial year.

Equation 2: Return on assets

$$\text{ROA} = \frac{\text{Net profit before tax (excluding extraordinary items)}}{\text{Average total assets}}$$

The reason for choosing these two dependent variables is that ROA is an indication of past performance and generally Tobin's Q is one of the measures of current market performance and indicates the outlook and further indicates the long-term organisational value. For the purposes of this study, the change in ROA and the

change in Tobin's Q were utilised to quantify performance of the organisation

4.7.2 The Independent variables

4.7.2.1 Gender

In order to measure diversity in respect of gender, the quantity of women over the total of all the board members was calculated (García-Meca, et al, 2015; Perryman, et al, 2015). The year-on-year change in the percentage in female directors was then utilised in this study as the first independent variable.

Equation 3 : Percentage of females to measure gender diversity

$$\textbf{Females} \quad = \quad \frac{\text{Quantity of female board members}}{\text{Total quantity of board members}}$$

4.7.2.2 Race

Blau's index of diversity was used to measure racial diversity as this determines the number of different ethnicities and how many members appear in each group. If the board consists of a single race only, the Blau index would be 0 (Andrevski, et al, 2014; Taljaard, et al, 2015). This is a common method used for racial diversity. Six major categories of races were found in the data which is Black, White, Coloured, Indian, Asian and Hispanic and if equal representation was found in all six categories, the index would be a maximum of 0.83. The calculation was utilised to find the level of diversity existing on boards. The change in Blau's index year-on-year was then used as the independent variable.

Equation 4 : Blau's index to measure race diversity

$$\boldsymbol{B} = 1 - \sum_{i=1}^{k} p_i^2$$

(Solanas, Selvam, Navarro & Leiva, 2012)

Where
p is the number of directors in each category
k is the number of categories that exist

4.7.2.3 Age

The calculation of diversity in respect of age was conducted utilising the coefficient of variance formula. This is done by taking the standard deviation of the directors' ages and dividing by the average age of the organisation (Ali, et al, 2014, Talavera, et al, 2018). The difference in the coefficient of variance year-on-year was used as the independent variable.

Equation 5 : Standard deviation

$$SD = \sqrt{\sum_{i=1}^{n} \frac{(x_i - \overline{x})^2}{n}}$$

(Solanas, et al, 2012)

Where
$\overline{x}$ is the mean age
n is the number of directors

Equation 6 : Coefficient of variation

$$V = \frac{\sqrt{\sum_{i=1}^{n} (x_i - \overline{x})^2 / n}}{\overline{x}}$$

(Solanas, et al, 2012)
Where
$\overline{x}$ is the mean age
n is the number of directors

4.7.2.4 Independence

The measurement of independence used was the quantity of independent members over the overall quantity of board directors as a percentage (García-Meca, et al, 2015). The year-on-year change in percentage of independence was then utilised in this study.

Equation 7: Percentage of Independent directors

Independence = Quantity of Independent board members
                         Total quantity of board members

4.7.3 Control Variables

As with previous research on board diversity, control variables that explain the movement in either ROA or Tobin's q were included to have a more complete model (Vafaei, et al, 2015; Muchemwa, et al, 2016). The variables utilised were the natural logs of size of the board, total assets of the organisation, and market capitalisation and the year-on-year change was used (Gyapong, et al, 2016; Chen, et al, 2015).

4.7.4 Model Equation

The regression model was built from the above as follows:

$Y_{it} = \alpha + \beta d\_females_{it} + \beta d\_race_{it} + \beta d\_age\_covar_{it} + \beta d\_independence_{it} + \beta d\_boardsize_{it} + \beta d\_firmsize_{it} + \beta d\_markcap_{it} + \mathcal{E}_{it}$

Where Y is the dependent variable which measures firm performance which are the

      change in ROA and change in Tobin's Q for firm i in time t

      d_females is the change in % of females

      d_independence is the change in % of independent directors

      d_age_covar is the change in coefficient of variation in age

      d_race is the change in Blau's index for race

      d_boardsize is the change in the natural log of board size

      d_firmsize is the change in the natural log of total assets

      d_markcap is the change in market capitalisation

      α represents the intercept

      β represents the regression coefficient

      $\mathcal{E}$ is the error term

4.8 Research Limitations

The study focuses on the JSE listed firms and may not be applicable to non-listed

firms. The research is also in an emerging market with a unique history and regulatory environment and may yield different results in developed countries in other international studies. Emphasis on transformation in South Africa is also more recent in the last two decades and may be more stable in developed countries which are further along in the transformation process.

The research was limited to gender, age, race and independence as this was available from publicly available information in the Integrated Annual Reports. Qualifications and tenure were not readily available for all 100 companies and the inclusion of these independent variables could yield a more robust analysis of board diversity.

Lastly, due to the time constraints of this research, the top 100 JSE listed companies has been used for a five year periods but the entire JSE, by industry and over a substantial period could produce more meaningful results.

4.9 Conclusion

This study was based on the top 100 JSE listed companies. Quantitative research was undertaken to ascertain the influence of diversity in the board on organisational performance using the changes year-on-year. Data was manually sourced from Annual Financial Statements and Integrated Annual Reports as in many previous studies. A panel that was unbalanced of 96 companies from 2012 to 2016 was used in the study and due to the panel nature of the study, a pooled OLS, fixed effect model or random effect model was utilised based on various tests. Various descriptive statistics have been analysed and will be presented together with the outcomes of the regression tests in the upcoming section.

Chapter 5: Results

5.1 Introduction

The unbalanced panel of 96 companies comprises of the JSE top 100 companies in terms of market capitalisation that appeared between the periods 2012 and 2016 for three or more years and had at least three years of financial information available. Appendix 2 lists the companies used in this study that appeared three or more times in the JSE top 100 and the number of years of financial information that was available for these entities. The only exception was Steinhoff International holdings Limited which was excluded from this list due to the company issuing a reliability warning on its website (Steinhoff, 2018).

Table 5.1 Listed firms per year

Number of firms				
2012	**2013**	**2014**	**2015**	**2016**
95	96	96	96	94

A descriptive analysis will follow of the 477 observations collected for ROA, Tobin's Q, gender diversity, age diversity, independence and age diversity for the five years. The data was then differenced to report on the change in the dependent and independent variables for each consecutive year. A descriptive analysis will be presented on these changes resulting in a final dataset of 381 observations.

This will be followed by the regression analysis and the final results will be presented.

5.2 Findings

Table 5.2 lists the total number of directors used in this study for each year from 2012 to 2016 with the average board size of 12.3 in 2012 increasing to 12.7 in 2014 and decreasing to 12.3 in 2016. The standard deviation increased marginally from 2.9 in 2012 in 2013 and 2014 and with minor decreases in 2015 and 2016. The marginal increases/ decreases over the period reflect minimal variation across the period of study as shown in figure 5.1. The minimum board size was five members with the maximum ranging between 20 and 24 over the five years.

Table 5.2 Board size

	2012	2013	2014	2015	2016
Number of directors	1171	1181	1215	1217	1159
Number of companies	95	96	96	96	94
Average boardsize	12.3	12.3	12.7	12.7	12.3
Standard deviation	2.9	3.1	3.3	3.2	2.9
Min	5	5	5	5	5
Max	20	20	21	24	21
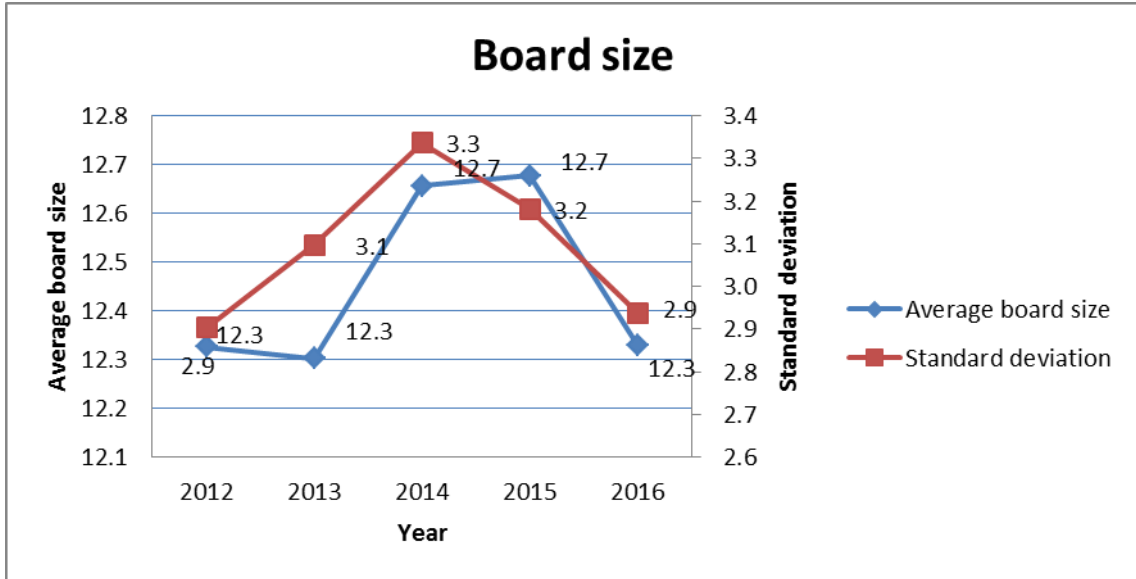
Figure 5.1 Average board size and standard deviation

Figure 5.2 reflects the frequency of firms having board sizes within the categories ranging from board size of five to a board size of 24. The majority of firms have board sizes between 11 and 15 members in the sample with very few companies having board sizes 21 and above.
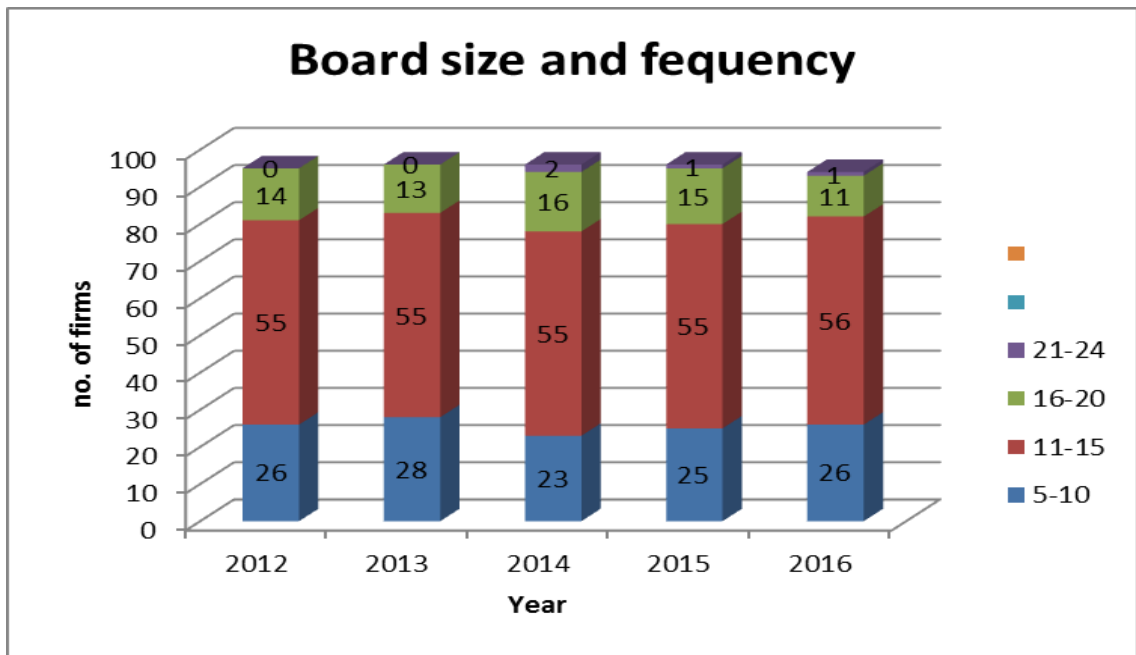
Figure 5.2 Board size and frequency

5.2.1 Gender

The number of females range from 205 in 2012 increasing each year to reach 239 in 2015 and 2016. The percentage of female representation was 17.5% in 2012 and gradually increases each year to 20.6% in 2016 as shown in figure 5.3.

The standard deviation ranges from 10.1% in 2012 and reaches 10.8% in 2014 and thereafter dropping to 10.5%. The overall increase in standard deviation indicates more variation in the percentage of female representation in 2016 than 2012.
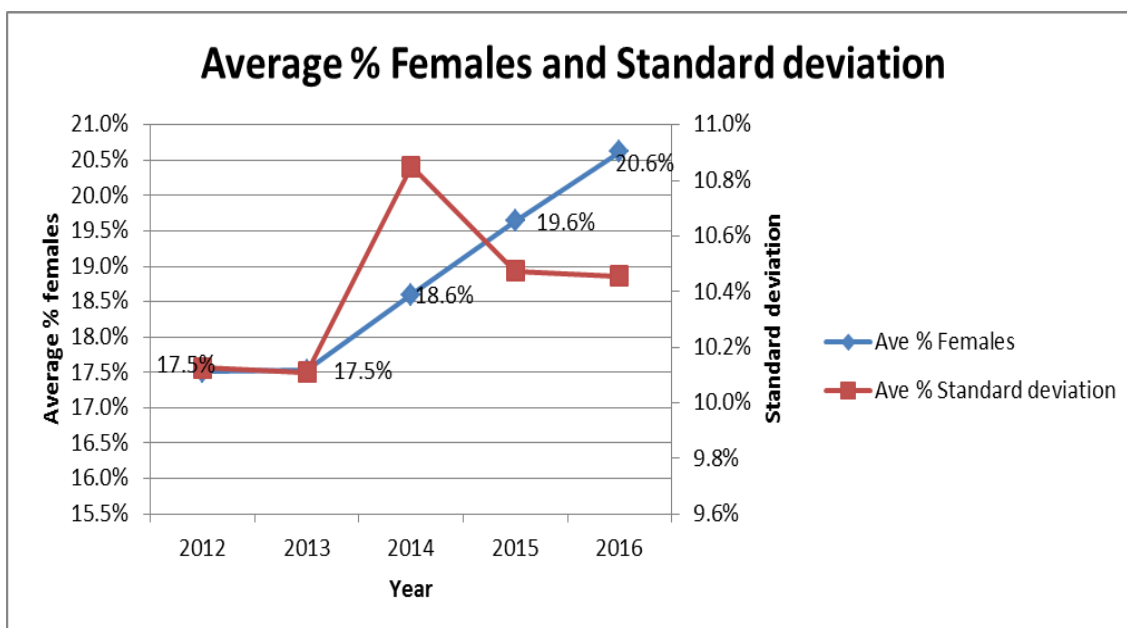
Figure 5.3 Average % females and standard deviation

Table 5.3 Average female representation

	2012	2013	2014	2015	2016
Number of directors	1171	1181	1215	1217	1159
Number of females	205	207	226	239	239
Number of males	966	974	989	978	920
% Females	17.5%	17.5%	18.6%	19.6%	20.6%
% Males	82.5%	82.5%	81.4%	80.4%	79.4%
Standard deviation (% of females)	10.1%	10.1%	10.8%	10.5%	10.5%
No. of firms	95	96	96	96	94
Ave Change in % of females		0.2%	1.0%	1.2%	0.6%
Average board size	12.3	12.3	12.7	12.7	12.3
Average females per firm	2.16	2.16	2.35	2.49	2.54

As mentioned earlier, the average board size ranges between 12.3 and 12.7 and table 5.3 and figure 5.4 reflects the average females per board as 2.16 in 2012, increasing from 2014 to reach 2.54 females in 2016. This increasing trend is a good sign as it is widely supported by the King Codes and the Employment Equity Act.
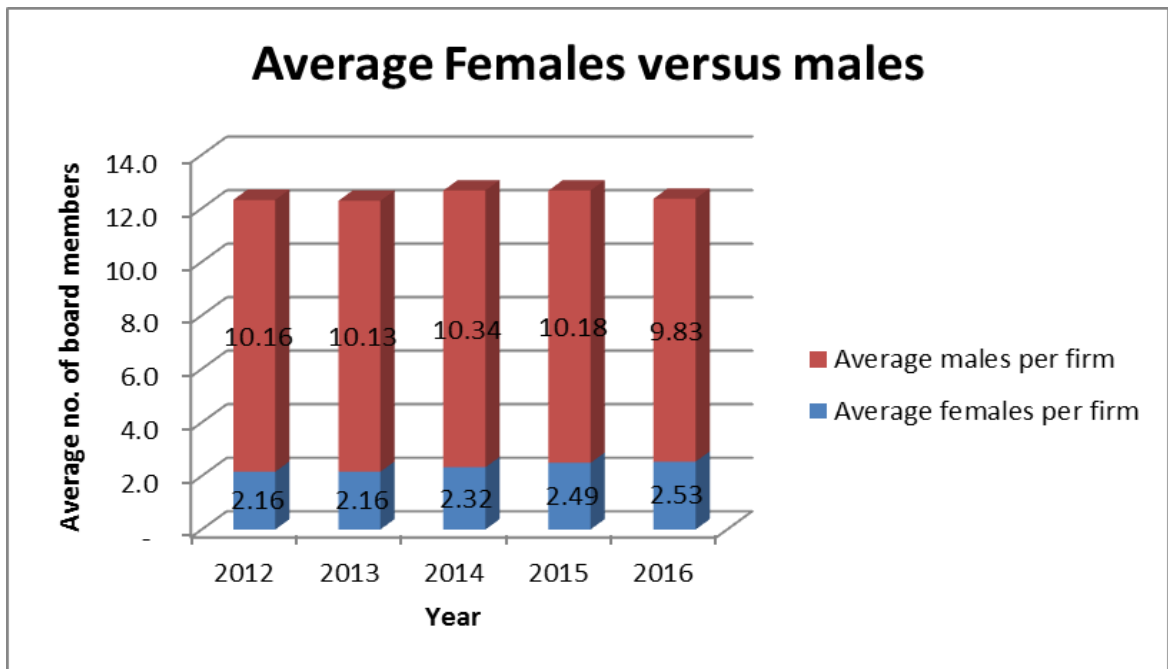
Figure 5.4 Average females versus males

The change in percentage of representation of women as shown in figure 5.5, increases from an average of 0.2% in 2013 and has positive movements each year with an average increase of 0.6% 2016. Even though the percentage of female representation is on the increase and male representation is gradually declining, 20.6% representation in 2016 is still relatively low in comparison to 79.4% male representation. The year-on-year change in percentage of representation per entity was used in the regression analysis.
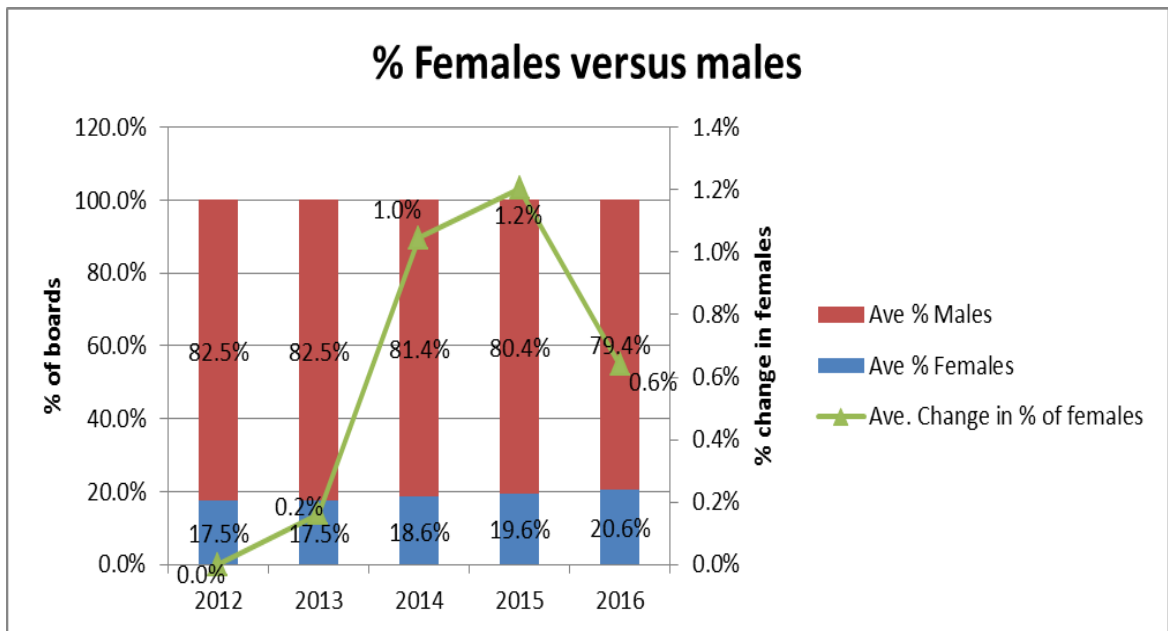
Figure 5.5 %Female representation and change in female representation

Table 5.4 depicts the average increases across the number of firms per year in the percentage of female representation. The standard deviation increases from 3.9% in 2013 to 5.5% in 2015 and decreases to 4.1% in 2016. The minimum and maximum changes in female representation shows that there are some firms that decreased in females representation in each year while there were also substantial increases in each year.

Table 5.4 Average change in female representation

	2012	2013	2014	2015	2016
Ave. Change in % of females		0.1%	0.8%	1.4%	0.5%
Std deviation (change in % of females)		3.9%	5.0%	5.5%	4.1%
Min (change in % of females)		-11.8%	-16.7%	-11.1%	-10.0%
Max (change in % of females)		13.2%	17.5%	22.2%	15.9%

In figure 5.6, the category 11% to 20% female representation has the highest frequency of firms which has been increasing since 2014. A substantial amount of firms have between 21% to 30% female representation and it is encouraging to note that the firms in the categories between 31% to 40% and 41% to 50% have been increasing since 2013. In addition, it is promising to report the number of firms with 0% representation has been on the decline since 2013, with only three firms having no female representation in 2016.
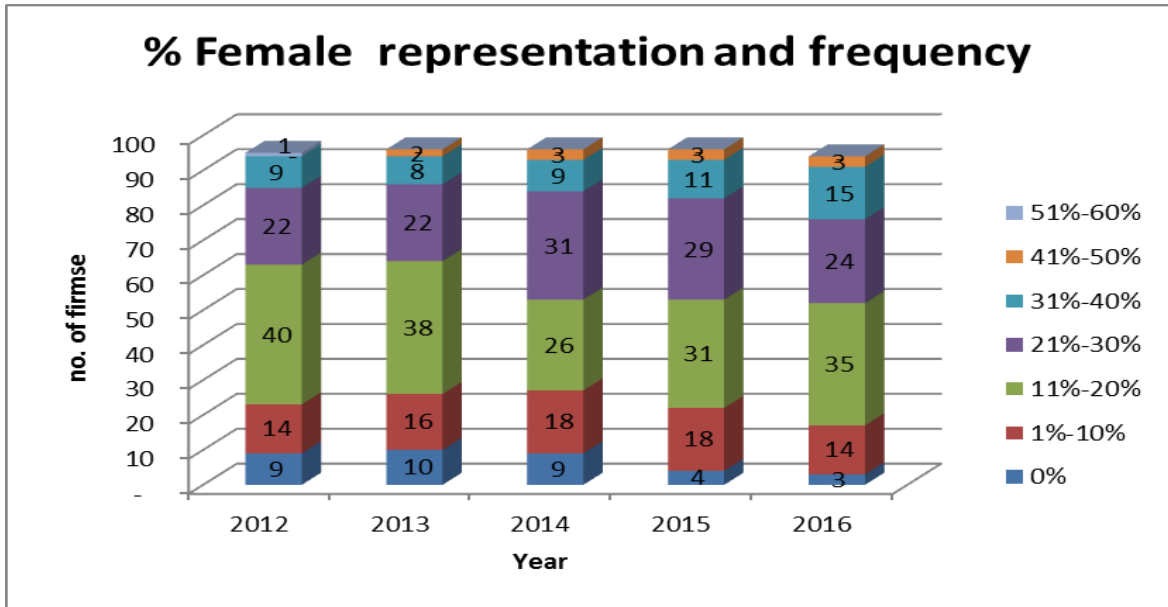
Figure 5.6 Frequency of female representation

5.2.2 Race

The average racial composition per year shown in Figure 5.7 indicates marginal increases in the average quantity of black members on the board up to 2015 with a slight decline in 2016. However, only the Indian race has had increases every year with the white board members remaining substantially higher than the other race groups even though they have been declining since 2014.

	2012	2013	2014	2015	2016
▬ Asian	0.07	0.06	0.08	0.08	0.07
▬ Hispanic	0.03	0.03	0.03	0.02	–
▬ Indian	0.73	0.77	0.83	0.88	0.91
▬ Coloured	0.34	0.25	0.28	0.29	0.29
▬ White	8.04	8.02	8.17	8.08	7.80
▬ Black	3.12	3.17	3.26	3.32	3.26
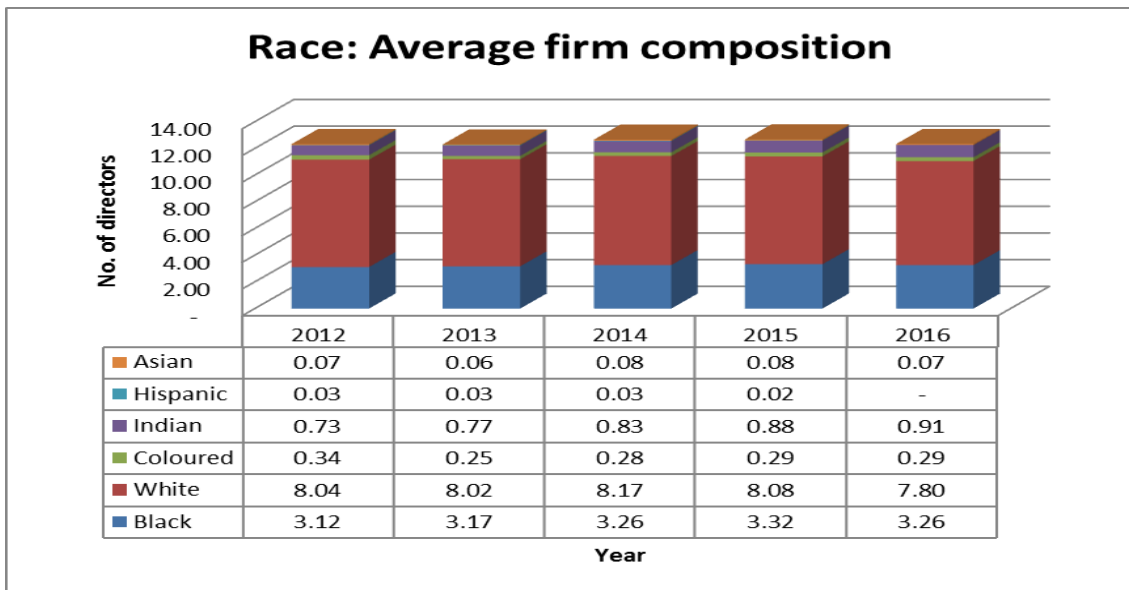
Figure 5.7 Average race per firm

The percentage of black board members as shown in figure 5.8 has increased marginally each year with 2016 showing that it is 26.4% up from 25.3% in 2012. There has also been an overall decline in white representation from 2012 showing 65.2% to 2016 which shows 63.2%. The Indian representation has gradually increased each year with 5.9% in 2012 to 7.4% in 2016. Even though the movements remain marginal, these trends are a positive move in terms of racial transformation of boards which is strongly empasised in King IV.

% Board racial representation

	2012	2013	2014	2015	2016
Asian	0.6%	0.5%	0.7%	0.7%	0.6%
Hispanic	0.3%	0.3%	0.2%	0.2%	0.0%
Indian	5.9%	6.3%	6.6%	6.9%	7.4%
Coloured	2.7%	2.0%	2.2%	2.3%	2.3%
White	65.2%	65.2%	64.5%	63.8%	63.2%
Black	25.3%	25.7%	25.8%	26.2%	26.4%
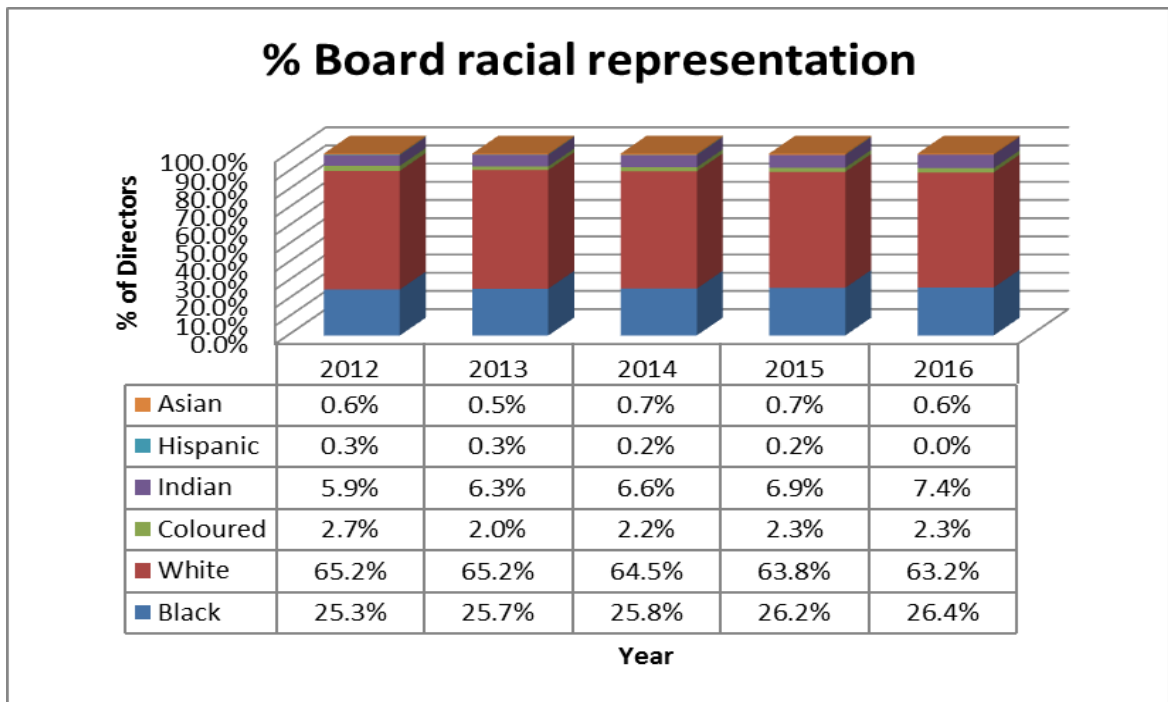
Figure 5.8 % Board racial representation

The degree of diversity as measured by Blau's index indicates a decline in racial diversity from 2013 to 2016 in figure 5.9. The change in Blau's index was used in the regression analysis and shows a decline from 2013 to 2015.
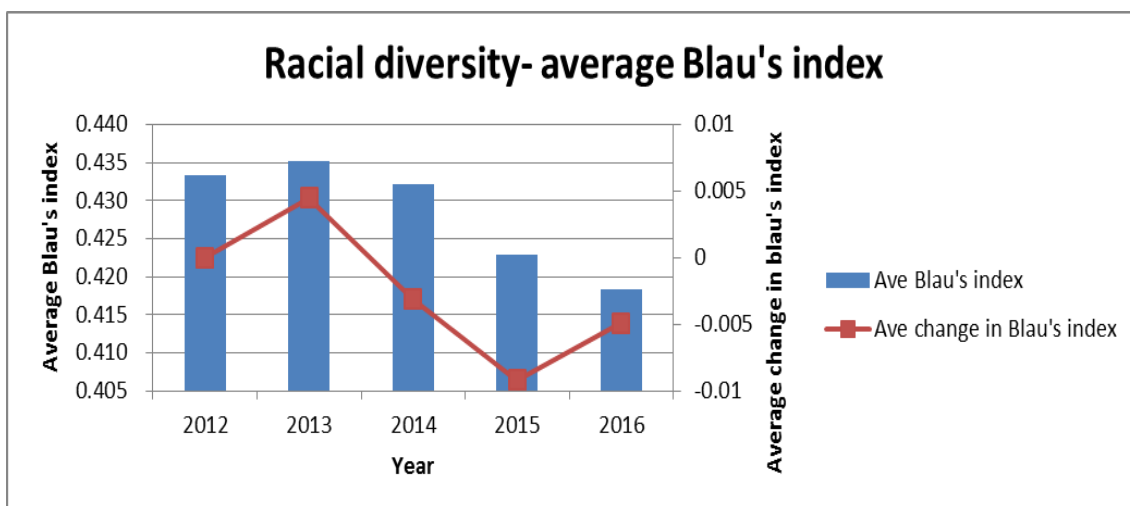
Figure 5.9 Racial diversity

The minimum Blau's index is zero as seen in table 5.5 and as at 2016 there are nine firms that still remain homogenous, which is the same figure as 2012. The maximum Blau's index was 0.72 in 2012 and 0.71 for the following years, indicating that there are some boards with a high level of diversity.

Table 5.5 Racial diversity

	2012	2013	2014	2015	2016
Ave Blau's index	0.433	0.435	0.432	0.423	0.418
Min Blau's index	0	0	0	0	0
Max Blau's index	0.72	0.71	0.71	0.71	0.71
No. of firms with single race	9	7	9	9	9
Ave change in Blau's index	0	0.004	(0.003)	(0.009)	(0.005)
Standard deviation (change in Blau's index)		0.076	0.062	0.048	0.053

5.2.3 Age

The average board age in 2012 is 55.5 years which marginally increases over the years to reach 57.3 years in 2016 as depicted in table 5.6 and figure 5.10. The minimum average board age is 46.3 years in 2012 which decreases to 41.5 years in 2013 and thereafter increases to reach a minimum average in 2016 of 46.4 years. The maximum average board age is 67.1 years in 2012 and increases to reach a high of 69.8 years in 2015 and then decreasing to 67.0 years in 2016.

Table 5.6 Average board age, standard deviation and coefficient of variation

	2012	2013	2014	2015	2016
Ave board age	55.7	55.9	56.4	56.8	57.3
Min ave board age	46.3	41.5	43.5	45.6	46.4
Max ave board age	67.1	68.0	68.9	69.8	67.0
Ave Std deviation	8.34	8.45	8.45	8.49	8.41
Ave change in std deviation		2.5%	0.3%	1.5%	0.0%
Ave coeficient of variation	14.9%	15.2%	15.1%	15.0%	14.8%
Ave change in coefficient of variation		0.1%	-0.1%	-0.1%	-0.3%

The standard deviation is 8.34 years in 2012, which marginally increases year on year up to 2015 with a slight decline in 2016 as shown in figure 5.10.
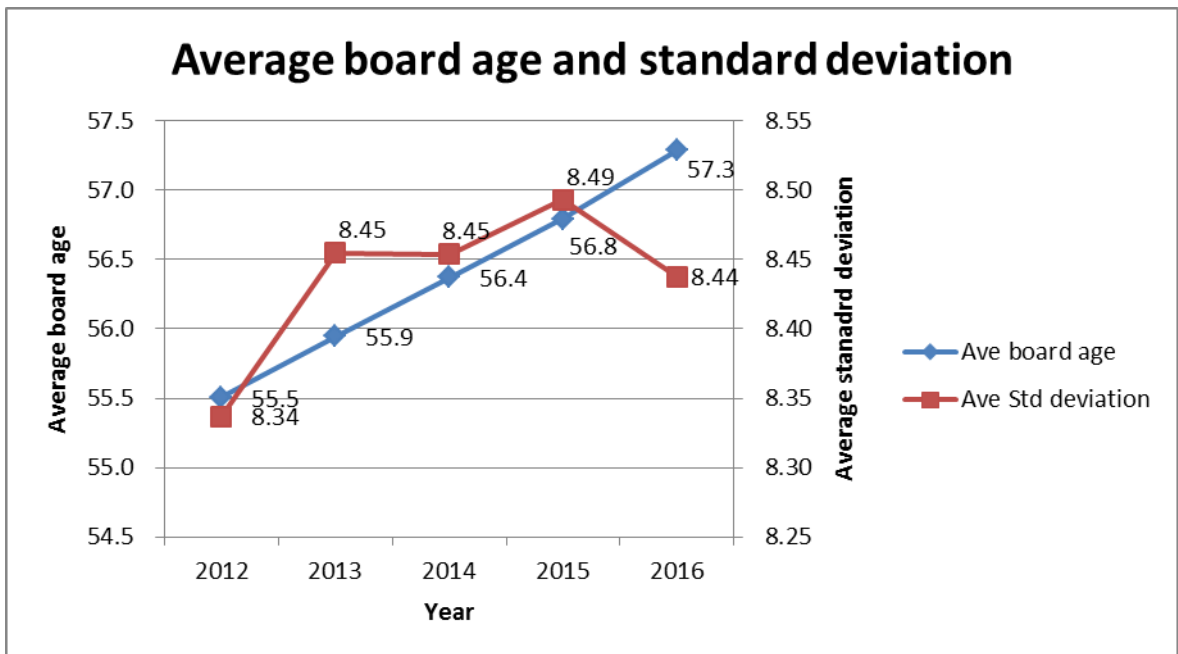
Figure 5.10 Average board age and standard deviation

The variation in average age is again shown to be fairly standard with the coefficient of variation of 14.9% in 2012, with very little movement throughout the five year period to reach 14.8% in 2016 as shown in figure 5.11. The percentage is however declining marginally since 2013. The change in coefficient of variation is used in the regression to find out if there is an impact on the dependent variables.
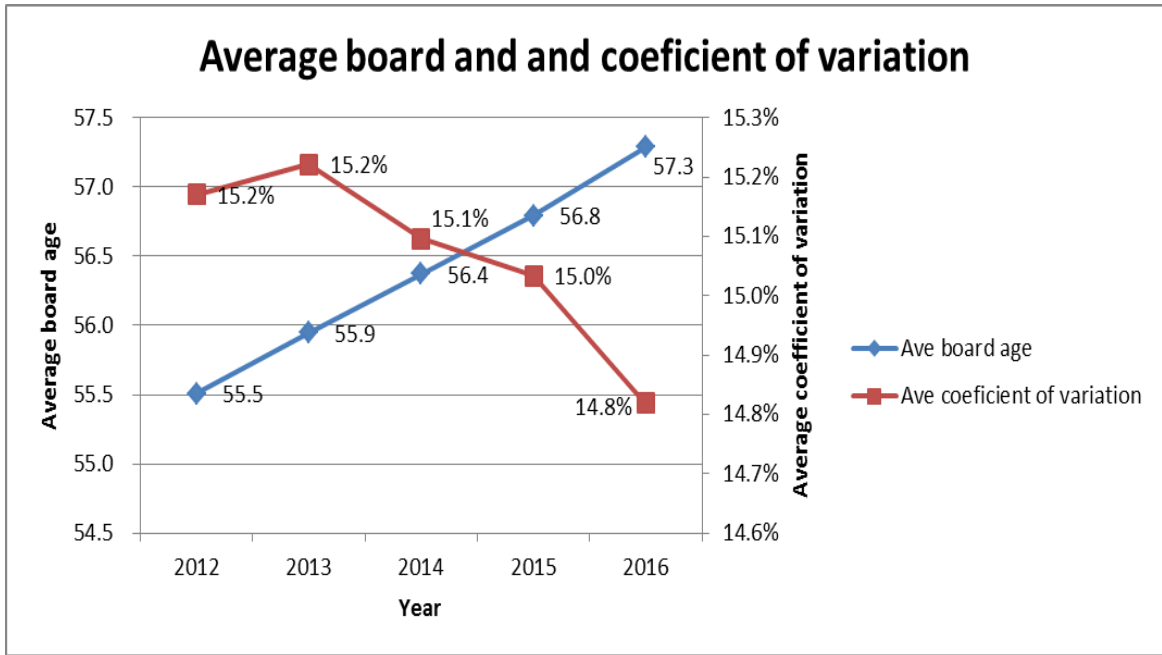
Figure 5.11 Average board age and coefficient of variation

Figure 5.12 shows the largest numbers of firms in the age category with an average board age 56-60 years and just a few boards with averages below 50 years and above 65 years.
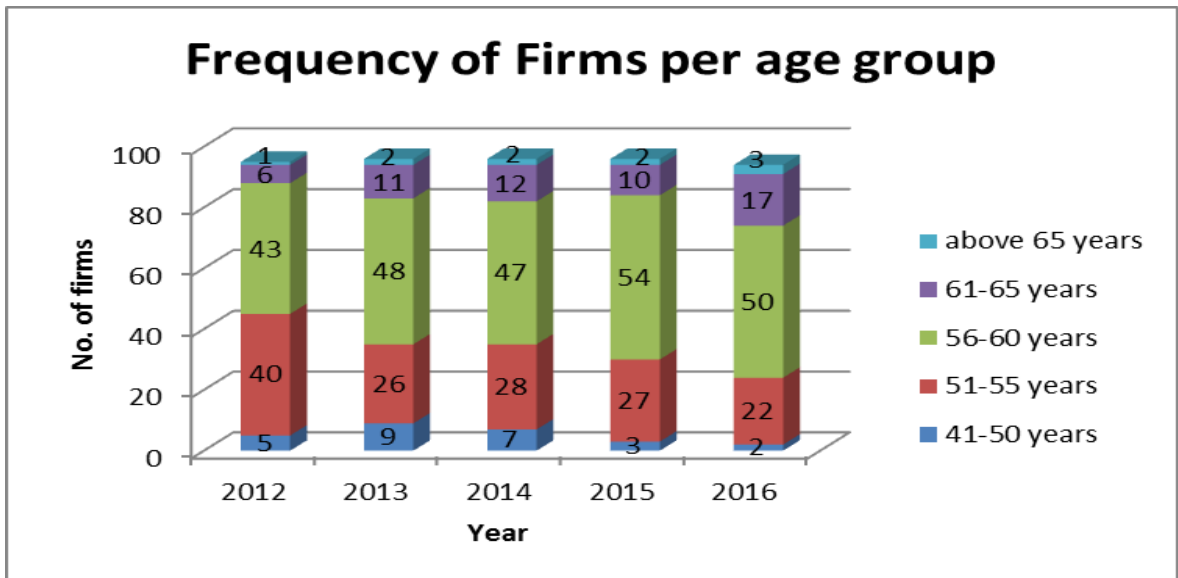
Figure 5.12 Frequency of firms per age group

5.2.4 Independence

The percentage of the number of independent board members was an average of

61.7% in 2012, varying very minimally throughout the 5 year period and reaching 62% in 2016, as can be seen in table 5.7 and figure 5.13. The standard deviation in average percentage independence was 18% in 2012 and decreases slightly to reach 16.5% in 2016 reflecting less variation in the sample.

Table 5.7 Average Independence

	2012	2013	2014	2015	2016
Ave % Independence	61.7%	62.1%	61.7%	62.4%	62.0%
Ave % Non- Independent directors	38.3%	37.9%	38.3%	37.6%	38.0%
No. of firms	95	96	96	96	94
Standard deviation (ave % Independence)	18.0%	17.3%	16.6%	15.2%	16.5%
Ave. Change in % of Independence		0.5%	-0.4%	0.7%	-0.5%
Std deviation (change in % of Independence)		7.3%	5.6%	6.5%	5.8%
Min (change in % of Independence)		-21.9%	-25.0%	-20.0%	-20.0%
Max (change in % of Independence)		32.1%	14.5%	27.8%	13.7%
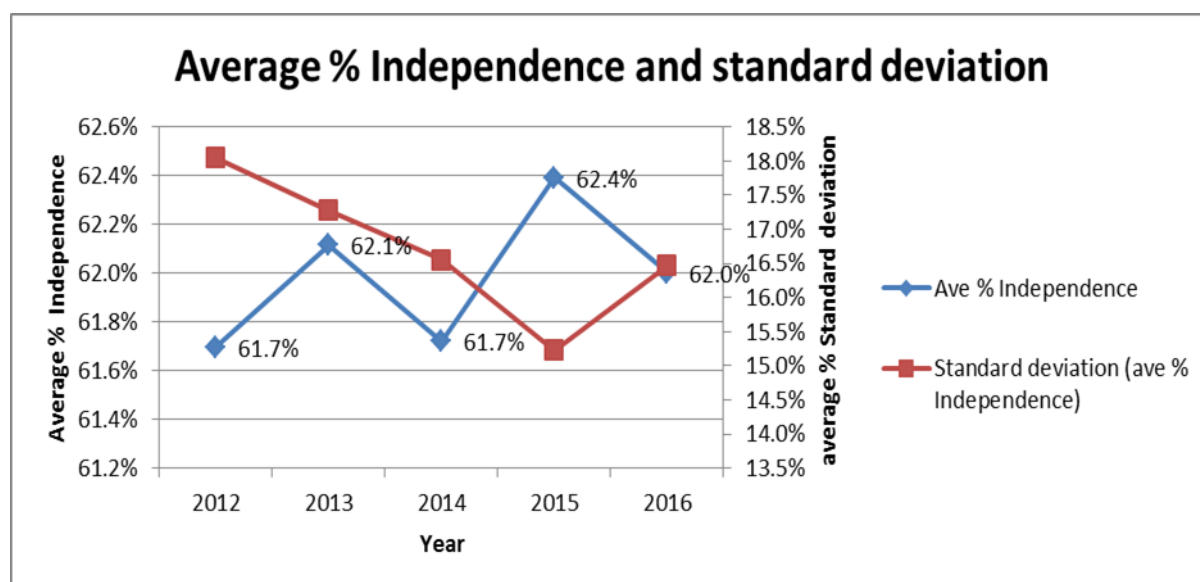
Figure 5.13 Average % Independence and standard deviation

The average change in percentage of independence has increased and decreased within the five years, resulting in the erratic trend shown in figure 5.14. These increases/ decreases are very minor. The year-on-year change will be used in the regression analysis.
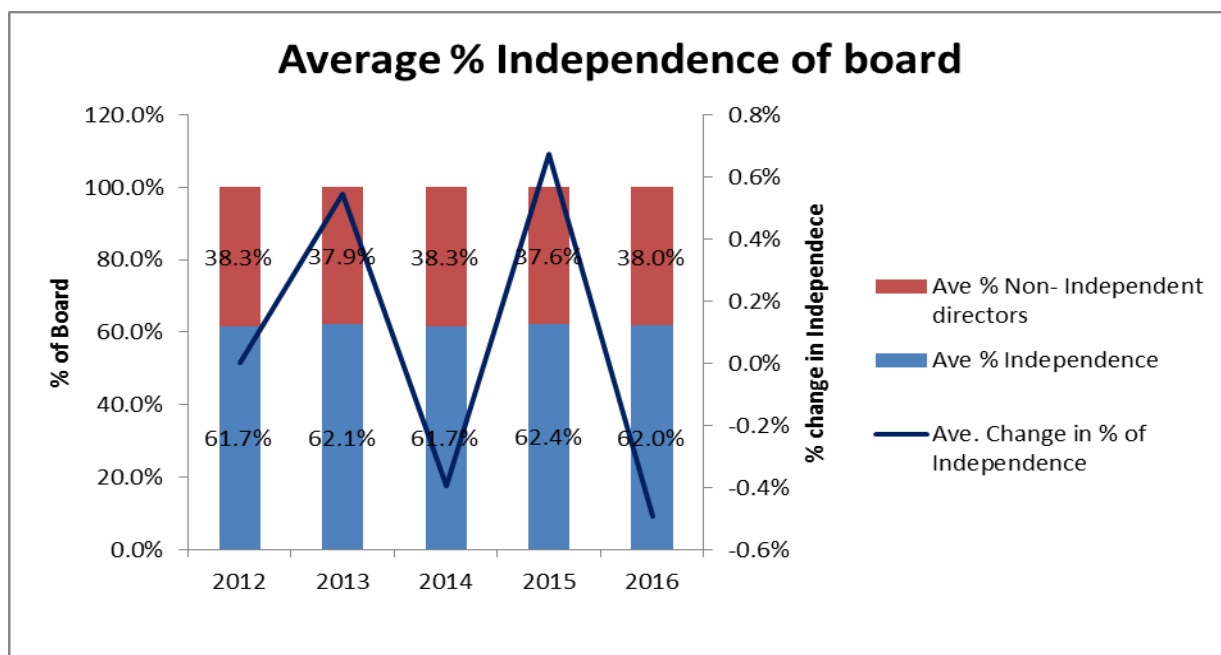
Figure 5.14 Average % of Independent directors and change over 5 years

5.3 Data Analysis and Descriptive statistics

5.3.1 Original data

Table 5.8 Summary of original data

Dependent and Independent variables:

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	477	.1124952	.1038871	-.0394466	.7816918
tobinq	477	1.879874	1.827485	.1293887	24.14793
females	477	.1869205	.1043274	0	.5454545
race	477	.4284359	.1836632	0	.71875
age_covar	477	.1503641	.0350829	.0733137	.3017726
independence	477	.6198553	.1667048	.0625	1

Control variables:

Variable	Obs	Mean	Std. Dev.	Min	Max
LNBoardsize	477	2.49143	.2525004	1.609438	3.178054
LNFirmsize	477	17.08915	1.473457	12.76134	21.40161
LNMarkcap	477	16.77957	1.937371	0	20.78526

Table 5.8 summarises the mean or average, the standard deviation, and both the

minimum and maximum in the unbalanced panel for the five years.

The average ROA for the five-year period was 11.2%, and the standard deviation of 10.4%. The average ROA per year has decreased from 13.09% in 2012 to 9.81% in 2016, also reflecting a year-on-year decrease. The minimum ROA was -3.9% and the maximum was 78%, indicating that there are outliers in the data.

Table 5.9 Average ROA

	2012	2013	2014	2015	2016
ROA	13.09%	11.8%	10.98%	10.56%	9.81%

The average Tobin's q is 1.88 and there was a standard deviation of 1.83. The minimum Tobin's q is 0.13 and maximum is 24.15, again indicating that there are outliers in the data. The Tobin's q was 1.90 in 2012 and has decreased to 1.61 in 2016.

Table 5.10 Average Tobin's Q

	2012	2013	2014	2015	2016
Tobinq	1.90	1.96	1.95	1.98	1.61

On average, quantity of women, as a percentage, on the board over the period was 18.7%, which had a standard deviation of 10.4%. There was a minimum representation of zero with maximum being 54.5%.

The average Blau's index measuring race is 0.43 with a standard deviation of 18.4%. There was a minimum Blau's index of zero, with the maximum being 0.72.

The mean age coefficient of variation is 15%, and the standard deviation was 3.5%. There was a minimum age coefficient of 7.3% with a maximum of 30.2%

The percentage independence on the board was an average of 62%, and the standard deviation was 16.7%. There was a minimum percentage of independence of 6.3% with a maximum of 100%.

5.3.2 Differenced data

To obtain more meaningful information and avoid spurious correlations, the data was differenced to find the impact of the change in the independent on the change in the dependent variables year-on-year.

Table 5.11 Summary of differenced data
Dependent and Independent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
d_roa	381	-.0080428	.0607736	-.392759	.623427
d_tobinq	381	-.0104803	.6585134	-2.836075	7.292843
d_females	381	.0076602	.0463658	-.1666667	.2222222
d_race	381	-.0032026	.0606517	-.3138272	.5
d_age_covar	381	-.000913	.0175501	-.1009142	.1018673
d_independ~e	381	.0008432	.0634714	-.25	.321267

Control variables

Variable	Obs	Mean	Std. Dev.	Min	Max
d_boardsize	381	.0022521	.117789	-.4418328	.3483067
d_firmsize	381	.1079223	.2028141	-2.258282	1.195467
d_markcap	381	.1209777	.9156145	-2.471053	16.01733

Table 5.11 summarises the mean, standard deviation, together with the minimum and the maximum figures in respect of the differenced data. There was a mean change in ROA of -0.8% and a standard deviation of 6.1%. There was a minimum change in ROA of -39.28% with the maximum change being 62.34%. The average change in ROA is shown in table 5.12 which shows there were declines every year in ROA from -1.29% in 2012 to -0.76% in 2016.

Table 5.12 Average change in ROA

	2013	2014	2015	2016
ΔROA	-1.29%	-0.82%	-0.42%	-0.76%
Standard deviation	4.94%	4.34%	8.36%	5.94%
Min	-29.53%	-29.38%	-26.80%	-39.28%
Max	18.29%	12.10%	62.34%	20.21%

The average change in Tobin's q was -0.01 and the standard deviation was 0.65. There was a minimum change in Tobin's q of -2.84 and the maximum was 7.29. The

standard deviation was 0.66 in 2013 decreasing to 0.46 in 2016 indicating less variation in the change in Tobin's q.

Table 5.13 Average change in Tobin's Q

	2013	2014	2015	2016
ΔTobinq	0.06	-0.01	0.03	-0.37
Standard deviation	0.66	0.42	0.95	0.46
Min	-1.82	-1.61	-2.04	-2.84
Max	5.15	1.94	7.29	0.55

The mean change in female representation for the five-year period was 0.8% with a standard deviation of 4.6%. The minimum change in female representation was -16.7% with the maximum being 22.2%.

The average change in Blau's index was -0.003 and the standard deviation was 0.061. There was a minimum change in Blau's index of -0.314 with a maximum change of 0.500.

The change in coefficient of variation on average was 0% with a standard deviation of 1.8%. The minimum change in the coefficient of variation was -10.1% with the maximum being 10.2%

The mean change in percentage independence was 0% with a standard deviation of 6.3%. The minimum change in independence was -25% while the maximum was 32.1%.

5.3.3 Board diversity and ROA

For panel data, a decision had to be taken between a pooled OLS model, fixed effect model and a random effect model. A few tests needed to be carried out to determine which model to use.

5.3.3.1 Test 1: Hausman test (Fixed effect or random model)

Table 5.14 Hausman test

```
. hausman fixed random
```

	── Coefficients ──			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
d_females	.0116428	.0260781	-.0144353	.0469849
d_independ~e	.0074379	.0047826	.0026553	.0362364
d_age_covar	.1677965	.1118303	.0559662	.112566
d_race	.004046	.0005347	.0035113	.0363285
d_boardsize	-.0049615	-.006438	.0014764	.0142172
d_firmsize	-.0647752	-.0434627	-.0213125	.0177906
d_markcap	.0071445	.008443	-.0012985	.002437

```
                    b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

     Test:  Ho:  difference in coefficients not systematic

              chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =         1.99
            Prob>chi2 =       0.9605
```

The Hausman test was utilised in panel data to determine if the fixed effect regression model was a better suited model than the random effect regression model in this case. A significant result, where chi² was below 0.05, indicates that it was preferable to utilise the fixed effects model. In this instance in table 5.14, the chi² was above 0.05 and it was therefore more suited to utilise the random effects model.

5.3.3.2 Test 2 Breusch and Pagan LM test

Table 5.15 Breusch and Pagan LM test

```
Breusch and Pagan Lagrangian multiplier test for random effects

     d_roa[company_id,t] = Xb + u[company_id] + e[company_id,t]

     Estimated results:
                      |     Var       sd = sqrt(Var)
          ────────────┼───────────────────────────────
               d_roa  |  .0036934        .0607736
                  e   |  .0041363        .0643142
                  u   |        0               0

     Test:  Var(u) = 0
                      chibar2(01) =      0.00
                    Prob > chibar2 =   1.0000
```

The Breusch and Pagan LM test was run to determine if a random effects model was better suited to use than a pooled OLS model. The above test in table 5.15 shows no significant differences across the firms with a chibar² value greater than 0.05. Therefore, it is more suitable to run a simple OLS regression.

Next, the data was tested for autocorrelation, multicollinearity and heteroskedasticity.

5.3.3.3 Test 3 Wooldridge test for autocorrelation/ serial correlation

The next test is the "Wooldridge test for autocorrelation" which is used in panel data, where a significant F-value would indicate the existence of serial correlation in the data (Wooldridge, 2010; Drukker, 2003). Serial correlation is often an issue where time-series or panel data is used. The xtserial command in Stata was used.

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      95) =      1.331
           Prob > F =      0.2516
```

The above test fails to reject the null hypothesis as the F-value is above 0.05. The data therefore has no significant autocorrelation.

Test 5.3.3.4 Test for Multicollinearity (VIF)

Table 5.16 VIF

```
. vif
```

Variable	VIF	1/VIF
d_independ~e	1.15	0.870298
d_age_covar	1.11	0.904074
d_females	1.07	0.932398
d_boardsize	1.07	0.937449
d_race	1.06	0.945811
d_markcap	1.04	0.965100
d_firmsize	1.01	0.986056
Mean VIF	1.07	

The VIF test should generally be below a value of 10, with a tolerance of 0.10, when testing for multicollinearity (Hair, et al, 2010). The mean VIF of 1.07 indicates no

significant multicollinearity.

5.3.3.5 Test 5 White's test for heteroskedasticity

Table 5.17 White's test for heteroskedasticity

```
White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(35)     =      52.28
        Prob > chi2  =     0.0303


Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	52.28	35	0.0303
Skewness	4.77	7	0.6881
Kurtosis	1.52	1	0.2174
Total	58.57	43	0.0570

White's test was used to test for general heteroskedasticity. This is a special type of the Breusch-Pagan test and per the above table 5.17, the p-value was below 0.05 and null hypothesis of homoscedasticity was then rejected. The decomposition of the IM-test was also significant for heteroskedasticity, but insignificant for skewness and kurtosis. The Breusch Pagan test for heteroscedasticity was also run to confirm results of this test. When using the OLS model, it is assumed that all variances are constant and there are no biased standard errors. Stata overcomes this issue by using the robust command, robust against heteroskedasticity.

5.3.3.6 OLS model (Ordinary Least Squares)

The above tests indicate that an ordinary OLS test was the most suitable model to be utilised and the results follow in table 5.18.

Table 5.18 Results of OLS regression (before robust command)

```
      Source │       SS           df       MS         Number of obs   =        381
─────────────┼──────────────────────────────────      F(7, 373)       =       2.05
       Model │  .052074134         7   .007439162      Prob > F        =     0.0478
    Residual │  1.35142719       373   .003623129      R-squared       =     0.0371
─────────────┼──────────────────────────────────      Adj R-squared   =     0.0190
       Total │  1.40350132       380   .003693425      Root MSE        =     .06019


         d_roa │      Coef.   Std. Err.       t    P>|t|     [95% Conf. Interval]
───────────────┼────────────────────────────────────────────────────────────────
     d_females │   .0260781   .0689687     0.38   0.706    -.1095381    .1616942
d_independence │   .0047826   .0521481     0.09   0.927    -.0977584    .1073236
   d_age_covar │   .1118303   .1850413     0.60   0.546    -.2520246    .4756852
        d_race │   .0005347   .0523486     0.01   0.992    -.1024007     .10347
    d_boardsize│  -.006438    .0270752    -0.24   0.812    -.0596771    .0468012
     d_firmsize│  -.0434627   .0153321    -2.83   0.005    -.0736109   -.0133146
      d_markcap│   .008443    .0034328     2.46   0.014     .0016929    .0151931
          _cons│  -.0044591   .0035693    -1.25   0.212    -.0114776    .0025595
```

The results of the normal OLS regression show an R² of 3.71% and an adjusted R² of 1.90% which represents the amount of variability in ROA explained by the model. The F-statistic is below 0.05% and is therefore an acceptable model fit. The independent variables all have p-values larger than 0.05 and indicate no significant influence on ROA. Only two of the control variables which are d_firmsize and d_markcap have a significant impact on ROA in this model. However, the problem of heteroskedasticity had to be fixed. The robust OLS model was then run to correct for the problem as shown in table 5.19.

Table 5.19 Results of OLS regression with robust standard errors

```
. regress $y $x, robust

Linear regression                                Number of obs   =        381
                                                 F(7, 373)       =       1.09
                                                 Prob > F        =     0.3681
                                                 R-squared       =     0.0371
                                                 Root MSE        =     .06019
```

d_roa	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
d_females	.0260781	.0429355	0.61	0.544	-.058348	.1105041
d_independence	.0047826	.0417841	0.11	0.909	-.0773794	.0869445
d_age_covar	.1118303	.156191	0.72	0.474	-.1952949	.4189555
d_race	.0005347	.0386549	0.01	0.989	-.0754741	.0765435
d_boardsize	-.006438	.0225313	-0.29	0.775	-.0507423	.0378664
d_firmsize	-.0434627	.0331488	-1.31	0.191	-.1086446	.0217192
d_markcap	.008443	.004895	1.72	0.085	-.0011822	.0180682
_cons	-.0044591	.0035859	-1.24	0.214	-.0115101	.002592

The model for the regression is:

d_roa= -0.004 + 0.026d_females + 0.005d_independence + 0.112d_age_covar + 0.001d_race – 0.006d_boardsize – 0.043d_firmsize + 0.008d_markcap

The R² is still 3.71% and an adjusted R² of 1.90% which remains unchanged in a robust test. The f-statistic has however changed to 0.37 which is now above 0.05 and now indicates that the model is weak and the explanatory variables are very insignificant in explaining the movement in ROA. The p-values for change in %females, change in independence, in coefficient of variation in age and change in Blau's index for race diversity are all above 0.05 and therefore have no significant influence on the change in ROA. The control variables also have p-values above 0.05 and have an insignificant influence on the change in ROA.

The model for the regression is:

d_roa= -0.004 + 0.026d_females + 0.005d_independence + 0.112d_age_covar + 0.001d_race – 0.006d_boardsize – 0.043d_firmsize + 0.008d_markcap

Where d_roa is change in Return on Assets

     d_females is the change in % of females

d_independence is the change in % of independent directors

d_age_covar is the change in coefficient of variation in age

d_race is the change in Blau's index for race

d_boardsize is the change in the natural log of board size

d_firmsize is the change in the natural log of total assets

d_markcap is the change in market capitalisation

5.3.4 Board diversity and Tobin's Q

As in the tests for board diversity and ROA, a similar decision had to be taken between a pooled OLS regression model, a fixed effect regression model or a random effect regression model when testing board diversity and Tobin's Q.

5.3.4.1 Test 1 Breusch and Pagan LM test

Table 5.20 Breusch and Pagan LM test

```
Breusch and Pagan Lagrangian multiplier test for random effects

     d_tobinq[company_id,t] = Xb + u[company_id] + e[company_id,t]

     Estimated results:
                              Var         sd = sqrt(Var)

              d_tobinq |   .4336399          .6585134
                     e |   .2725755          .5220877
                     u |   .1307638          .3616128

     Test:   Var(u) = 0
                          chibar2(01) =     18.47
                        Prob > chibar2 =   0.0000
```

The Breusch and Pagan LM test was run to determine if a random effects model was more suitable to use than a pooled OLS model. Table 5.20 shows significant differences across the firms with a chibar² value less than 0.05. This indicates that it was not suitable to use a pooled OLS model and a random effects model is preferred.

Next, the decision had to be made between whether fixed effect model was preferable to the random effect model.

5.3.4.2 Hausman Test

The Hausman test was utilised to ascertain if the fixed effect regression model or random regression effect model is better suited to the data. A significant p value would mean the fixed effect regression model was preferred.

Table 5.21 Hausman test

	—— Coefficients ——			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
d_females	-.579494	-.6562003	.0767063	.1473332
d_independ~e	-.596755	-.5766477	-.0201074	.1178892
d_age_covar	-.5856484	-.4883075	-.0973408	.2485236
d_race	.7549614	1.52347	-.7685083	.1260432
d_boardsize	.1565521	.1172873	.0392649	.
d_firmsize	-.33305	-.4189254	.0858754	.0929945
d_markcap	.085858	.084828	.00103	.0081667

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(7) = (b-B)'[(V\_b-V\_B)^{\wedge}(-1)](b-B)$$
$$= 83.66$$
Prob>chi2 =   0.0000
(V_b-V_B is not positive definite)

The above test has a p value below 0.05 which indicates that it was preferable to run a fixed effect model.

Next, the data was tested for autocorrelation, multicollinearity and heteroskedasticity.

5.3.4.3 Test 3 Wooldridge test for autocorrelation/ serial correlation

The next test is the "Wooldridge test for autocorrelation" which is used in panel data, where a significant F-value would indicate that significant serial correlation exists in the data (Wooldridge, 2010; Drukker, 2003). As the differenced data was used, both the original and differenced data was tested for serial correlation using the xtserial command in Stata.

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      95) =      3.705
           Prob > F =      0.0572
```

The above test fails to reject the null hypothesis with a F-value above 0.05. The data therefore has no significant autocorrelation.

5.3.3.4 Test 4 for Multicollinearity (VIF)

Table 5.22 VIF test

```
. vif
```

Variable	VIF	1/VIF
d_independ~e	1.15	0.870298
d_age_covar	1.11	0.904074
d_females	1.07	0.932398
d_boardsize	1.07	0.937449
d_race	1.06	0.945811
d_markcap	1.04	0.965100
d_firmsize	1.01	0.986056
Mean VIF	1.07	

The VIF test should generally be below a value of 10, with a tolerance of 0.10, when testing for multicollinearity (Hair, Black, Babin & Anderson, 2010). The mean VIF of 1.07 indicates no significant multicollinearity.

5.3.4.5 Test 5 White's test for heteroscedasticity

Table 5.23 White's test for heteroskedasticity

```
White's test for Ho: homoskedasticity
        against Ha: unrestricted heteroskedasticity

        chi2(35)     =      36.40
        Prob > chi2  =     0.4034

Cameron & Trivedi's decomposition of IM-test
```

Source	chi2	df	p
Heteroskedasticity	36.40	35	0.4034
Skewness	6.96	7	0.4332
Kurtosis	1.36	1	0.2439
Total	44.71	43	0.3997

White's test was again used to test for general heteroskedasticity. The chi² was above 0.05 and therefore null hypothesis for homoscedasticity fails to be rejected. The decomposition of the IM-test was also not significant for heteroskedasticity, skewness and kurtosis.

5.3.4.6 Fixed effect Model

The above tests indicate that a fixed effect model had to be run and was most suitable and the model contains no significant autocorrelation, multicollinearity, heteroskedasticity, skewness or kurtosis. The results are presented in table 5.24.

Table 5.24 Results of Fixed effect model

```
Fixed-effects (within) regression              Number of obs     =         381
Group variable: company_id                     Number of groups  =          96

R-sq:                                          Obs per group:
     within  = 0.0487                                        min =           3
     between = 0.1003                                        avg =         4.0
     overall = 0.0628                                        max =           4

                                               F(7,278)          =        2.03
corr(u_i, Xb)  = 0.0900                        Prob > F          =      0.0513
```

d_tobinq	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
d_females	-.579494	.6774447	-0.86	0.393	-1.913067	.7540788
d_independence	-.596755	.5154939	-1.16	0.248	-1.611522	.4180122
d_age_covar	-.5856484	1.75823	-0.33	0.739	-4.046784	2.875487
d_race	.7549614	.5172575	1.46	0.146	-.2632776	1.7732
d_boardsize	.1565521	.248249	0.63	0.529	-.3321344	.6452387
d_firmsize	-.33305	.1906517	-1.75	0.082	-.7083543	.0422543
d_markcap	.085858	.0341752	2.51	0.013	.018583	.153133
_cons	.0215492	.0345771	0.62	0.534	-.0465169	.0896153
sigma_u	.51514478					
sigma_e	.52208767					
rho	.49330662	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(95, 278) = 2.91               Prob > F = 0.0000
```

The overall R² is 6.28% indicating that 6.28% of the variation in Tobin's Q can be explained by the model. The F-value is greater than 0.05 showing F=0.0513 indicating a poor model fit. The p-values for change in %females, change in independence, change in coefficient of variation in age and change in Blau's index for race diversity are all above 0.05 and therefore have no significant impact on the change in ROA. Two of the control variables, d_boardsize and d_firmsize have insignificant p- values and only change in market capitalisation has a significant impact on the change in Tobin's Q. The F-value that all u_i = 0 , F = 0.000, shows that the fixed effects is the appropriated model and pooled OLS and random effects models will give biased estimates.

The model for the regression is:

d_tobinq = 0.022 - 0.579d_females -0.597d_independence - 0.586d_age_covar + 0.755d_race+ 0.157d_boardsize – 0.333firmsize 0.086d_markcap

where d_tobinq is change in Tobin's Q

d_females is the change in % of females

d_independence is the change in % of independent directors

d_age_covar is the change in coefficient of variation in age

d_race is the change in Blau's index for race

d_boardsize is the change in the natural log of board size

d_firmsize is the change in the natural log of total assets

d_markcap is the change in market capitalisation

5.4 Summary of results

Table 5.25 Summary of results

Independent variables	Measured by	Dependent variable								
		Δ ROA			Δ ROA (robust)			Δ Tobin's Q		
		P-value	Significant	Coeficient	P-value	Significant	Coeficient	P-value	Significant	Coeficient
Gender diversity	Δ % females	0.706	No	0.026	0.544	No	0.026	0.393	No	-0.579
Race diversity	Δ Blau's index	0.992	No	0.001	0.989	No	0.001	0.146	No	0.755
Age divesity	Δ age coefficient of variation	0.546	No	0.112	0.474	No	0.112	0.739	No	-0.585
Independence	Δ % independence	0.927	No	0.005	0.909	No	0.005	0.248	No	-0.597
Intercept				-0.004			-0.004			0.022

The results of all three tests confirm an insignificant impact of all of the independent variables on ROA and Tobin's Q.

Gender

H0: The impact of diversity in respect of gender in the boardroom on organisational performance is not significant.

H1: The impact of diversity in respect of gender in the boardroom on organisational performance is significant.

The above tests fail to reject the null hypothesis that the impact of diversity in respect of gender, calculated by the change in percentage of females, on organisational

performance is not significant.

Race

H0: The impact of diversity in respect of racial diversity in the boardroom on organisational performance is not significant.
H1: The impact of diversity in respect of racial diversity in the boardroom on organisational performance is significant.

The above tests fail to reject the null hypothesis that the impact of race diversity on organisational performance is not significant.

Age

H0: The impact of diversity in the boardroom in respect of age on organisational performance is not significant.
H1: The impact of diversity in the boardroom in respect of age on organisational performance is significant.

The above tests fail to reject the null hypothesis that the impact of diversity with regard to age on organisation performance is not significant.

Independence

H0: The percentage of board independence has an insignificant impact on organisational performance
H1: The percentage of board independence significantly impacts organisational performance.

The above tests fail to reject the null hypothesis that the impact of independence on organisational performance is not significant.

Board Diversity

H0: The impact of the combined gender diversity, race diversity, age diversity, percentage of independent board members on organisational performance is not significant.

H1: The impact of the combined gender diversity, race diversity, age diversity, percentage of independence on the performance of the organisation is significant.

The above tests fail to reject the null hypothesis that the impact of board diversity, measured by the combined change in gender diversity, race diversity, age diversity, percentage of independent board directors, on organisational performance is not significant.

Chapter 6: Discussion of results

6.1 Introduction

The results presented in the preceding chapter will be discussed in further detail and compared to similar recent studies. As mentioned, diversity of the board and organisational performance studies have yielded mixed results and researchers have been trying to find if there is a significant influence of board diversity characteristics which include gender, age, race and independence so that a business case to promote diversity can be made. Corporate goverance codes around the world have been calling for increased levels of diversity in the boardroom and a significant impact would help promote diversity. The agency theory states that boards are appointed as agents of the company and are responsible for firm perfromance through their montoring activities was important in determining the study's objective which was to determine if the composition of the board, and how diverse the board is, actually influences firm performance.

The four independent variables will be discussed separately.

6.2 Gender

The matter of gender diversity has become of increasing importance globally where voluntary quotas are being suggested and some countries are including gender diversity as part of regulation. The JSE has also made gender diversity reporting a requirement to stress the importance thereof. This study aimed to investigate if there was a business case for appointing more females on the board.

The change in percentage of females was determined to have an insignificant impact on the change in Tobin's Q and separately on ROA for the period of this study. Thus, a business case was not proved in this study.

Table 6.1 Gender diversity, ROA, Tobin's Q

Independent variables	Measured by	Dependent variable								
		Δ ROA			Δ ROA (robust)			Δ Tobin's Q		
		P-value	Significant	Coeficient	P-value	Significant	Coeficient	P-value	Significant	Coeficient
Gender diversity	Δ % females	0.706	No	0.026	0.544	No	0.026	0.393	No	-0.579
Intercept				-0.004			-0.004			0.022

Ten recent studies were located in respect of gender diversity and board performance in the past five years using either Tobin's Q or ROA to quantify performance of the organisation and established that there was a significant positive impact, a significant negative impact or insignificant results as listed in table 6.2.

Chapple, et al (2014) and the Masters study by Lalloo (2017) based on the South African real estate industry yielded similar insignificant results as this study. Possible reasons for insignificant results was that the quantity of women in the boardroom are so small that it is difficult to see the effectiveness through financial performance at this stage and therefore countries like Australia are making gender diversity a regulatory concern (Chapple, et al , 2014). Studies have also indicated that for female directors to make a noticeable impact there needs to be between 10% to 30% representation on the board (Konrad, Kramer & Erkut, 2008; Kogut, Colomer & Belinsky, 2014). In our sample in 2016, 17 of the 94 companies were below this recommended number with 22 companies being below 10% in 2015. On average, the percentage of females is increasing in our sample year-on-year, but 43 companies have had no change in the number of females from 2012 to 2016. Using changes year-on-year, thus resulted in very small values.

Although a business case has not been proved by this study, eight of the studies listed below in table 6.2 have determined that there was a significant positive effect of diversity in respect of gender on organisational performance and should not be ignored. Transformation in the boardroom in terms of gender still remains an important consideration around the world. Garcia-Meca, et al (2016) argue that women possess characteristics that will increase governance. Post and Byron (2015) suggest that females are more collaborative in the decision-making process, which could ultimately enhance firm performance. Post and Byron (2015) also state that women increase monitoring capabilities of the firm.

Table 6.2 Previous studies on Gender diversity and ROA, Tobin's Q

Year	Study	Country	No of firms	Period	Gender	Firm Performance Measure
2014	Ali, M., Ng, Y. L. & Kulik, C. T.	Australia	288	2012	+	Employee Productivity, ROA
2014	Chapple, C., & Humphrey, J. E.	Australia	287	2004-2011	Insignificant	Tobin's Q
2015	García-Meca, E., García-Sánchez, I., & Martínez-Ferrero, J.	9 Countries	159	2004-2010	+	ROA, Tobin's Q
2015	Post C., & Byron K.	133 countries	Meta-analysis-140 studies	upto 2014	+ (ROA, ROE) Insignificant (Market)	ROA, ROE Market performance
2015	Vafaei, A., Ahmed, K., & Mather, P.	Australia	157	2005-2011	+	ROA, ROE, Tobin's Q
2015	Ntim	South Africa	169	2002-2007	+	ROA, Tobin's Q
2016	Gyapong, E., Monem, R. M., & Hu, F.	South Africa	245	2008-2013	+	Tobin's Q
2016	Abdullah, N., S., Ismail, K. N. I. K., & Nachum, L.	Malaysia	841	2008	+ (ROA) - (Tobin's Q)	ROA, Tobin's Q
2016	Terjesen, S., Couto, E. B., & Francisco, P. M.	International	3876	2010	+	ROA, Tobin's Q
2017	Lalloo	South Africa	33	2003-2015	Insignificant	ROA

Source: (own research)

6.3 Race

Racial diversity has been emphasised in corporate governance codes around the world due to a history of racial disparities in many countries were certain race groups where disadvantaged in terms of education, health and employment. Racial transformation is a key issue raised in the King Codes and South Africa's Employment Equity Act. This paper looked to investigate if a significant influence of racial diversity on the organisational performance could be determined.

The below results in table 6.3 indicate that diversity in terms of race has a non-significant effect on both ROA and Tobin's Q.

Table 6.3 Racial diversity and firm performance

Independent variables	Measured by	Dependent variable								
		Δ ROA			Δ ROA (robust)			Δ Tobin's Q		
		P-value	Significant	Coeficient	P-value	Significant	Coeficient	P-value	Significant	Coeficient
Race diversity	Δ Blau's index	0.992	No	0.001	0.989	No	0.001	0.146	No	0.755
Independence	Δ % independence	0.927	No	0.005	0.909	No	0.005	0.248	No	-0.597
Intercept				-0.004			-0.004			0.022

As indicated earlier in this research, previous studies on racial diversity and organisational performance are very limited. Table 6.4 summarises the studies located in the past five years using ROA, Tobin's Q, ROE or share price performance as the dependent variable. The results to date are varied with some researchers concluding that there is a significant positive result, one significant negative result and one insignificant result.

This study supports Taljaard, et al (2015) that there is an insignificant influence of diversity with regards to race on the performance of the organisation, utilising the fixed effect model. It must be noted that there was a significant result with Tobin's Q using the pooled OLS method which ignores the cross sectional and time dimension of the dataset. The various tests however concluded that the fixed effect model was most preferable in this research.

Reasons for an insignificant result or not finding positive results could be that group conflict offsets any benefits of racial diversity (Carter, D'Souza, Simpkins & Simpson, 2010). Also, in this study, the Blau's index change year-on-year has been so minor that it is difficult to find a trend. This is also concerning regarding transformation efforts in the country that the Blau's index has not changed much each year and the actual change has decreased very slightly from 2013 to 2016.

Although this study has not identified a significant business case for racial diversity, there are four studies listed below that have found a significant positive impact and are important for consideration. Reasons for a positive impact found in earlier studies on firm performance is that there is greater innovation, creativity and competition as diverse races add different perspectives (Andrevski, et al, 2014; Ntim, 2015).

Reasons for significant negative results was that diverse group add group conflict were individuals are different (Garcia-Meca, et al, 2015)

Table 6.4 Previous studies in past 5 years on Race diversity and firm performance

Year	Study	Country	No of firms	Period	Race	Firm Performance Measure
2014	Andrevski G., Richard O.C., Shaw J.D., & Ferrier W.J.	US	115	2001-2003	+	Share performance
2015	García-Meca, E., García-Sánchez, I., & Martínez-Ferrero, J.	9 Countries	159	2004-2010	-	ROA, Tobin's Q
2015	Ntim	South Africa	169	2002-2007	+	ROA, Tobin's Q
2015	Ararat, M., Aksu, M., & Cetin, A. T.	Turkey	95	2006	+	ROE
2015	Taljaard, C. C. H., Ward, M. J. D., & Muller, C. J.	South Africa	40	2000-2013	Insignificant	Share performance
2016	Gyapong, E., Monem, R. M., & Hu, F.	South Africa	245	2008-2013	+	Tobin's Q

Source: (own research)

6.4 Age

King IV recommends a balanced board in terms of age and some countries have started regulating retirement ages. In this study the change in the age coefficient of variation was determined to have no significant impact on the change Tobin's Q and separately on ROA.

Table 6.5 Age diversity and firm performance

Independent variables	Measured by	Dependent variable								
		Δ ROA			Δ ROA (robust)			Δ Tobin's Q		
		P-value	Significant	Coeficient	P-value	Significant	Coeficient	P-value	Significant	Coeficient
Age divesity	Δ age coefficient of variation	0.546	No	0.112	0.474	No	0.112	0.739	No	-0.585
Intercept				-0.004			-0.004			0.022

Previous studies in the past five years have had mixed results as listed in table 6.6. There have not been studies identified in the past five years that have concluded the impact of diversity in respect of age on organisational performance to be insignificant. However, older studies such as Van-ness, Miesing and Kang (2010), and Jhunjhunwala and Mishra (2012) found no significant impact of age diversity and firm performance. Both these studies state that the reason for the insignificant results may

be group conflict in diverse groups of various ages that offset any benefits of board diversity. The reason for negative results in Ali, et al (2014) and Talavera, et al (2018) was a similar reason that boards of diverse ages have more group conflict.

Studies that have found a significant positive results state that younger boards are more energetic and innovative whilst older boards bring in experience and their network which complement each other (Ararat, et al, 2014).

Table 6.6 Previous studies in past five years on age diversity and firm performance

Year	Study	Country	No of firms	Period	Age	Firm Performance Measure
2014	Ali, M., Ng, Y. L. & Kulik, C. T.	Australia	288	2012	-	Employee Productivity, ROA
2015	Ararat, M., Aksu, M., & Cetin, A. T.	Turkey	95	2006	+	ROE
2015	Taljaard, C. C. H., Ward, M. J. D., & Muller, C. J.	South Africa	40	2000-2013	-	Share performance
2018	Talavera, O., Yin, S., & Zhang, M.	China	97	2009-2013	-	ROA, ROE

Source: (own research)

6.5 Independence

Corporate governance initiatives such as King IV stress the importance of a balance of independence on the board to improve monitoring. The reason that independence has become a serious concern internationally and locally is due to the large amount of global corporate scandals. This research therefore sought to determine if a business case exists for a greater level of independence in the boardroom by studying the impact on organisational performance.

It was found that there was an insignificant impact of the change in the percentage of independence on the change in ROA and separately on Tobin's Q by this study.

Table 6.7 Independence, ROA, Tobin's Q

Independent variables	Measured by	Dependent variable								
		Δ ROA			Δ ROA (robust)			Δ Tobin's Q		
		P-value	Significant	Coeficient	P-value	Significant	Coeficient	P-value	Significant	Coeficient
Independence	Δ % independence	0.927	No	0.005	0.909	No	0.005	0.248	No	-0.597
Intercept				-0.004			-0.004			0.022

Recent studies, in the past five years, have had mixed results on the impact that independence has on organisational performance as listed below in table 6.8. There were three studies with positive results, one negative and two insignificant that were identified.

This study supports the results of Muchemwa, et al (2016) and Terjesen, et al (2016) that there is an insignificant influence of independence on organisational performance. Possible reasons for insignificant results was that some boards increase in size more for political reasons and does not actually contribute to firm performance in addition to non-independent directors having deeper insight into the firm to better control the firm (Muchemwa, et al, 2016).

Studies that found that board independence positively impacts organisational performance argue that outside directors increase monitoring capabilities of the firm and increases trust in the board from the market and furthermore have the ability to prevent self-dealing of executive directors and improved investment efficiency through better monitoring. (Liu, et al, 2015; Rashid, 2015).

Table 6.8 Previous studies in past five years on Independence and firm performance

Year	Study	Country	No of firms	Period	Independence	Firm Performance Measure
2015	Rashid	Bangladesh	186	2006-2011	+	Expense ratio(agency costs)
2015	Liu, Y., Miletkov, M. K., Wei, Z., & Yang, T.	China	2057	1999-2012	+	ROA, ROE
2015	Ararat, M., Aksu, M., & Cetin, A. T.	Turkey	95	2006	-	ROE
2016	Muchemwa, M. R., Padia, N., & Callaghan,	South Africa	266	2006-2012	Insignificant	ROA, Tobin's Q, ROE
2016	Terjesen, S., Couto, E. B., & Francisco, P. M.	International	3876	2010	Insignificant	ROA, Tobin's Q
2017	Lalloo	South Africa	33	2003-2015	+	ROA

Source: (own research)

6.6 Conclusion of results discussion

This study found insignificant impacts of gender diversity, racial diversity, age diversity and independence of the board on ROA and separately on Tobin's Q. These findings are supported by certain previous studies as noted above but also inconsistent with other research which increases the debate on diversity in the boardroom and organisational performance. No business case could be supported by this study from the results obtained.

Chapter 7: Conclusion

7.1 Introduction

The agency theory explains the relationship where directors are delegated by shareholders to both monitor the firm and reduce agency costs. Directors are thus accountable for firm performance. This study sought to determine if the make-up of the board composition has any significant effect on organisational performance, both on historical performance and market performance. Further motivation for this study was the growing emphasis placed on board diversity worldwide for both racial diversity and gender diversity to assist with transformation initiatives. Various international and local scandals have also prompted the call for more independence in the boardroom in order to achieve higher levels of monitoring of the firm, its governance and performance. Certain countries have also placed retirement age regulations on boards to encourage age diversity on boards. King IV in particular has stressed the importance of having a balanced board in respect of gender, race, age and number of independent board members. Past studies to date on board diversity have yielded mixed results and a growing debate on whether there is a business case to motivate board diversity. Thus, this study aimed to test if a significant impact of these four diversity characteristics on organisation performance could be determined.

7.2 The findings

7.2.1 Gender

Gender equality and fairness has received attention worldwide with certain countries having quotas for female representation in the boardroom. Many corporations have been resistant to transformation despite the importance and emphasis placed on gender equality by corporate governance codes and the JSE requirements. This study indicates that although the percentage of gender representation has been increasing since 2012, 43 firms in our sample have not increased the number of females on the board since 2012 further re-iterating the resistance to change. This research aimed to determine the influence that diversity in respect of gender has on organisational performance and concluded that this influence was insignificant, both against ROA and Tobin's Q. Equality in gender still, however remains important for fairness and equality and there may be non-financial benefits of having more females in the boardroom.

7.2.2 Race

As a result of colonisation, many countries face inequalities in terms of race. In South Africa, there are several Acts that exist in order to rectify the racial disparities of the past and have a more equal society. Board racial diversity is imperative as recommended by King IV and its preceding report. This study used Blau's index to measure racial diversity and found that the Blau's index worsened in 2014, 2015 and 2016, indicating that on average, firms are becoming less racially diverse. The year-on-year change was however, very marginal, again indicating resistance to change by corporations. Board racial diversity was determined to have an insignificant impact on organisational performance.

7.2.3 Age

Younger directors contribute innovation and creativity to the board while older directors contribute their experience and networks. King IV recommends a balance in terms of age on the board. This study indicates that the average board age has been increasing year-on-year since 2012 and the minimum average board age has been increasing since 2013. The results showed that diversity in respect of age has an insignificant influence on organisational performance.

7.2.4 Independence

Independence of directors has gained much more attention due to the various scandals in corporations globally, as independent directors enhance monitoring of the firm. There have been minimal fluctuations in the year-on-year percentage of independence in this research and the study found that there was an insignificant impact of the percentage of independence and organisational performance.

7.2.5 Summary of findings

The results of the study of the unbalanced panel of 96 firms for the period 2012 to 2016 were insignificant for each of the independent variables using a robust OLS model to test the influence on ROA. The results also showed these four independent variables have an insignificant influence on Tobin's Q, using the fixed effect model. Thus, the

results did not prove a business case for boardroom diversity based on gender, age, race or independence of the board and also not as per the predictions of the agency theory. Although this is consistent with certain previous studies as detailed in chapter six, there are several studies that have found significant positive impacts using these diversity and performance variables and cannot be ignored.

7.3 Implications for management

All four of the independent variables were determined to have an insignificant effect on organisational performance and thus a business case for a more diversified boardroom was not proved by this research. However, the data analysis indicates that there have been very minor movements in board diversity for the period under review. Of importance for gender equality, are the 43 firms that show no movement in the quantity of females for the period under review and the Blau's index that has decreased for racial diversity. In terms of King IV and good corporate governance, greater efforts need to be in place for transformation, both for gender diversity and racial diversity.

7.4 Future studies

Transformation and diversity are key issues around the world and future studies should investigate the advantages of having a more diversified and balanced board that may not particularly result in immediate financial performance. The impact of having greater levels of diversity, particularly in South Africa may only be found in later years, as boards are still in early stages of diversity as indicated by the very minor movement in the Blau's index for race diversity and the 43 firms that have not changed the quantity of women on their boards since 2012.

Future research on diversity and organisational performance could possibly include the entire JSE and analyse the results per industry. King IV recommendations of a balanced board only became available in 2016 and it would be interesting to investigate if this governance code has any effect on diversity in later years.

Qualitative studies could follow this present study to gain valuable insight on why boardroom diversity has not had the expected significant impact on performance, possibly due to the group conflict that has been mentioned by several researchers. It would also be important to investigate why board diversity has had such marginal movements since 2012, despite corporate governance codes.

It would also be important to study the non-financial benefits of a balanced and more diverse board to encourage transformation and diversity.

Further studies can also be conducted, incorporating different countries with different corporate governance structures, as South Africa may differ to other countries and continents.

7.5 Limitations of study

This study included gender, age, race and independence as board diversity characteristics. There are several other aspects of board diversity that were not tested such as qualifications, tenure, experience and also more specifically, diversity of the CEO.

The R^2 and adjusted R^2 in the models tested were very low signifying that a very low percentage of the change in ROA and Tobin's Q could be explained by the model.

Due to the study analysing annual changes in the variables, only four years of observations were utilised. A much longer study, possibly 10 years or more may provide more meaningful results.

The performance was quantified by utilising the ROA and Tobin's Q formulae in this study based on previous studies. However, firm performance can be measured in several different ways including non-financial methods of measurement.

Lastly, the period under review, 2012 to 2016 coincides with a period where the South African economy was on a constant annual decline in GDP, beginning from 2011 and only started improving in 2017 (Trading economics, 2018). This may have had an influence on the performance of the organisations utilised in this research.

7.4 Conclusion

This research's objective was to establish if the impact of diversity using gender, age, race and independence of the board, on firm performance was significant. A significant positive result would support the predictions of the agency theory and also motivate the

business case for board diversity. This study, however found that board diversity using these four variables has insignificant effect on organisational performance. Previous studies with similar results have explained that group conflict of a more diverse board offset any benefit that may be gained from board diversity, which is a suggestion for future research. Although a business case was not proved in this study, transformation and diversity remains a pertinent issue globally and significant positive results in several other studies should not be ignored. The analysis of the data in this study indicate that several organisations are resistant to transformation, particularly with regard to gender and racial diversity and more effort and initiatives need to be put in place for transformation to occur more rapidly.

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Appendix 1- Past studies on board diversity and firm performance

Year	Study	Country	No of firms	Period	Gender	Race	Age	Independence	Firm Performance Measure
2014	Ali, M., Ng, Y. L. & Kulik, C. T.	Australia	288	2012	+		-		Employee Productivity, ROA
2014	Andrevski G., Richard O.C., Shaw J.D., & Ferrier W.J.	US	115	2001-2003		+			Share performance
2014	Chapple, C., & Humphrey, J. E.	Australia	287	2004-2011	insignificant				Tobin's Q
2015	Low, D., C., M., Roberts, H., & Whiting, R. H.	Hong Kong, South Korea, Malaysia, Singapore	2751	2012-2013	+				ROE
2015	García-Meca, E., García-Sánchez, I., & Martínez-Ferrero, J.	9 Countries	159	2004-2010	+	-			ROA, Tobin's Q

Year	Study	Country	No of firms	Period	Gender	Race	Age	Independence	Firm Performance Measure
2015	Post C., & Byron K.	133 countries	Meta-analysis - 140 studies	up to 2014	+ (ROA, ROE) Insignificant(Market)				ROA, ROE Share performance
2015	Vafaei, A., Ahmed, K., & Mather, P.	Australia	157	2005-2011	+				ROA, ROE, Tobin's Q
2015	Ntim	South Africa	169	2002-2007	+	+			ROA, Tobin's Q
2015	Rashid	Bangladesh	186	2006-2011				+	Expense ratio(agency costs)
2015	Liu, Y., Miletkov, M. K., Wei, Z., & Yang, T.	China	2057	1999-2012				+	ROA, ROE
2015	Ararat, M., Aksu, M., & Cetin, A. T.	Turkey	95	2006	+	+	+	-	ROE
2015	Taljaard, C. C. H., Ward, M. J. D., & Muller, C. J.	South Africa	40	2000-2013	+	Insignificant	-		Share performance

Year	Study	Country	No of firms	Period	Gender	Race	Age	Independence	Firm Performance Measure
2016	Perryman, A. A., Fernando, G. D., Tripathy, A.	International	2454	1992-2012	+				ROE
2016	Gyapong, E., Monem, R. M., & Hu, F.	South Africa	245	2008-2013	+	+			Tobin's Q
2016	Muchemwa, M. R., Padia, N., & Callaghan, C. W.	South Africa	266	2006-2012				Insignificant	ROA, Tobin's Q, ROE
2016	Abdullah, N., S., Ismail, K. N. I. K., & Nachum, L.	Malaysia	841	2008	+ (ROA) - (Tobin's Q)				ROA, Tobin's Q
2016	Terjesen, S., Couto, E. B., & Francisco, P. M.	International	3876	2010	+			Insignificant	ROA, Tobin's Q
2017	Lalloo	South Africa	33	2003-2015	insignificant			+	ROA
2018	Talavera, O., Yin, S., & Zhang, M.	China	97	2009-2013			-		ROA, ROE

(Source: Own research)

Appendix 2: List of 96 JSE listed firms in this study

Entity	No. of years of financial info.	Entity	No. of years of financial info.
AECI Limited	5	MMI Holdings Limited	5
African Rainbow Min Ltd	5	Mondi Ltd	5
Anglo American Plat Ltd	5	Mondi plc	5
Anglo American plc	5	Mr Price Group Ltd	5
Anglogold Ashanti Ltd	5	MTN Group Ltd	5
ArcelorMittal SA Limited	5	Nampak Ltd	5
Aspen Pharmacare Hldgs Ltd	5	Naspers Ltd -N-	5
Assore Ltd	5	Nedbank Group Ltd	5
Attacq Limited	5	Netcare Limited	5
AVI Ltd	5	New Europe Prop Inv plc	5
Barclays Africa Grp Ltd	5	Northam Platinum Ltd	5
Barloworld Ltd	5	Oceana Group Ltd	5
BHP Billiton plc	5	Old Mutual plc	5
Bidvest Ltd	5	Omnia Holdings Ltd	5
Brait SE	5	Pick N Pay Holdings Ltd	5
British American Tob plc	5	Pick n Pay Stores Ltd	5
Capital&Counties Prop plc	5	Pioneer Foods Group Ltd	5
Capitec Bank Hldgs Ltd	5	PPC Limited	5
Clicks Group Ltd	5	PSG Group Ltd	5
Compagnie Fin Richemont	5	Rand Merchant Ins Hldgs Ltd	5
Coronation Fund Mngrs Ltd	5	RCL Foods Limited	5
Datatec Ltd	5	Redefine International P.L.C	5
Discovery Ltd	5	Redefine Properties Ltd	5
Distell Group Ltd	5	Reinet Investments S.C.A	5
EOH Holdings Ltd	5	Remgro Ltd	5
Exxaro Resources Ltd	5	Resilient Prop Inc Fund	5
Famous Brands Ltd	5	Reunert Ltd	5
Firstrand Ltd	5	RMB Holdings Ltd	5
Glencore plc	5	Rockcastle Global Real Estate Co I	4
Gold Fields Ltd	5	SABMiller plc	4
Grindrod Ltd	5	Sanlam Limited	5
Growthpoint Prop Ltd	5	Santam Limited	5
Harmony GM Co Ltd	5	Sappi Ltd	5
Hosken Cons Inv Ltd	5	Sasol Limited	5
Hyprop Inv Ltd	5	Shoprite Holdings Ltd	5
Illovo Sugar Ltd	5	Sibanye Gold Limited	5
Impala Platinum Hldgs Ltd	5	Standard Bank Group Ltd	5
Imperial Holdings Ltd	5	Sun International Ltd	5
Intu Properties plc	5	Telkom SA SOC Ltd	5
Investec Ltd	5	The Foschini Group Limited	5
Investec plc	5	The Spar Group Ltd	5
KAP Industrial Hldgs Ltd	5	Tiger Brands Ltd	5
Kumba Iron Ore Ltd	5	Tongaat Hulett Ltd	5
Liberty Holdings Ltd	5	Trencor Ltd	5
Life Healthc Grp Hldgs Ltd	5	Truworths Int Ltd	5
Lonmin plc	5	Tsogo Sun Holdings Ltd	5
Massmart Holdings Ltd	5	Vodacom Group Ltd	5
Mediclinic Internat. Ltd	4	Woolworths Holdings Ltd	5

Source: JSE (personal communication, March 5, 2018)

Appendix 3: Ethical Clearance Letter

Gordon Institute of Business Science
University of Pretoria

14 August 2018

Bryant Melissa

Dear Melissa

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained

We wish you everything of the best for the rest of the project.

Kind Regards

GIBS MBA Research Ethical Clearance Committee